



# A Continuous Authentication Approaches for Data Security Services against Reconstruction Attacks using Multiple Biometric

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**Abstract:** Internet Security and data privacy is preserved by the appropriate authentication schemes. User name and password based authentication is the fundamental step to access internet services. The conventional authentication system follows initial session verification rather than continuous verification. The continuous authentication is referred as the detection of authorized users and authenticating them even after successful login. This type of continuous authentication technique plays vital role in internet security as it performed by various types of authentication schemes. In this paper, a complete authentication protocol is used, which focuses on the throughout authentication scheme that is from login to logout time. This system about the authorized person's face detection for throughout session (From login time to logout time). The Web camera placed in front of the system in which they are working that camera will capture the face of the authorized person if the person start to move from the camera the capturing process will struck and the transaction will not allow the unauthorized persons to work. This application is fully applied with the camera. Once the person wants to do the transaction then he should sit in front of the camera and the face is authenticated for further steps. The camera will continuously monitor the face to avoid in authenticate transactions. If the user tries to move from the camera then the transaction will not be continued. It will get struck. So, user should be there until he/she finishes the transactions. This project utilizes face matching algorithm and canny and sobal algorithm for edge detection.

**Keywords:** Face matching, Finger print recognition, authentication, Internet Security, biometric techniques, continuous authentication.

## I. INTRODUCTION

Data security and secure User authentication is an ultimate goal of almost all applications. All application has the aim to authenticate user for secure data access. This yeared lots of attention due to the recent boosting in the frequency and complexity of cyber-attacks. Nowadays authentication systems are grown with different types of working procedures and attribute against those attacks. In traditional authentication system, username and passwords are used for authentication. All authentication techniques such as biometric, device based and graphical passwords are used at the time of login, there is no verification performed during the session. In some traditional web mail servers such as Yahoo, used active screen monitoring technique [1]. This allows the users to logout the session if they are inactive. This type of traditional method avoids unauthorized access in the website. The services will be provided after successful authentication and the resources will be available for a fixed period of time. This kind of authentication is typically based on single session verification. This approach believes that a single verification, when performed at the beginning of the session is sufficient, and that the identity of the user is constant during the whole session. So there is a need to develop a continuous verification for secure throughout

the session. In this paper, we surveyed various techniques and tools used for web security.

Internet security consists of the procedures adopted to monitor and prevent authorized entry in remote a computer network. Internet security involves the authorization of access to data in a distributed manner, which has more challenges in the real time phenomenon. Internet security begins with basic username and password verification. This type of verification only consist the password field, this type of authentication is known as single factor authentication. Security management for internet is different from the normal desktop security application [2]. A desktop application security only requires basic security when comparing with the internet applications, this type of applications needs strong techniques along with new hardware support to thwart hacking and other types of attacks [3]. To resolve this issue, we need continuous user authentication methods that continuously monitor and authenticate users based on some biometric elements. Earlier mechanisms for continuous user authentication cannot authenticate users without biometric observation, so biometric authentication is useful for continuous authentication. In such application, the continuous user authentication to be easy

# Reliable Multi Authority Authentication and Attribute-Based Encryption System for Distributed Data Security

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**Abstract:** Data storing and sharing is an imperative functionality in distributed networks. We propose a secure and reliable multi-owner data sharing scheme in cloud environment. It implies that any user in the group can securely share data with others in the distributed systems. The proposed scheme is able to support dynamic groups efficiently. Specifically, new granted users can directly decrypt data files uploaded before their participation without contacting with data owners directly. The size and computation overhead of encryption are constant and independent with the number of revoked users.

**Keywords:** Cloud security, Hybrid Cloud, Attribute Based Encryption, Private Cloud.

## I. INTRODUCTION

Cloud computing is a paradigm that allows users to access application residing at distant locations especially data centers. NIST definition (Mell and Grance, 2011) of cloud computing states that "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction".

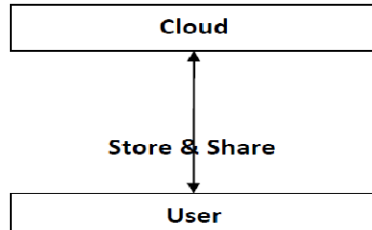


Figure 1.1: Overview of Cloud Computing Paradigm

Fig 1.1 depicts an overview of cloud computing paradigm. Cloud offers vast variety of services in pay-as-you-go manner; in other words it provides services on the basis of utility computing. Amazon Web Services, Google App Engine and Microsoft Azure are some of the current examples of public utility cloud computing services. Amazon Web Services provides a suite of cloud-based services including storage, computation and even human intelligence through the Amazon Mechanical Turk. Further the commercial web service provided by Amazon

named Elastic Compute cloud (EC2) allows small companies and individuals to rent computers on which to run their own computer applications. In addition to this Google offers browser-based enterprise applications, through services such as Google Apps. The most important contribution to cloud computing has been the emergence of killer apps from leading technology giants such as Microsoft and Google. As the usage of cloud computing is increasing exponentially, the necessity of providing security and access control has become mandatory.

The primary motivation of our work is the need of security in terms of access control for cloud computing services with multi factor authentication. Several large scale industries and organizations make use of computation solutions and storage infrastructures provided by the cloud service providers (CSP). The affordable and reliable nature of cloud services makes it usage prominent with wider range of organizations. But still the emergence of several security issues by means of attacks and vulnerabilities had created a great scope for security research. The newer ways of using cloud computing for computing, storage and deployment is leading to the development of the cloud domain in different technological perspectives, leading to need of added security. This will motivate the idea of using cloud computing for critical applications.

Privacy preservation and access management forms the two major influences for maintaining cloud data security. The main theme of most of the existing schemes is to make use of cryptographic measures to achieve data security. Each scheme provides solution to specific technical functionality issues, but lags in the provision of complete suitable solution to issues relating to cloud data





# Structural Boundaries Detection of Ice Floe of Sea Ice using T-Snake GVF

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**Abstract:** Image processing is one of the upgrading research areas to find out the relevant pattern. It can be applied in many fields of medical, satellite records, analyzing data. Satellite records of image plays an important role in image processing. Satellite view of Sea ice image has been taken to detect the boundaries of the ice floe. Sea ice is a formation of sea water freezing. When the sea ice is broken ice floes were formed from them and ice floe is large pack of floating ice. Detecting the ice floes many Image Processing techniques has proposed. But they prove some of the drawbacks like missing data, inaccurate structural analysis because of difficulties in ice floe identification, separation of boundaries connected ice floes, it is an important issue for the climate and wave and structural ice analysis. To solve these problems here proposed a T-Snake algorithm on GVF, which provide an accurate identification of related pattern and structural boundaries for ice floe.

**Keywords:** Image processing, Ice floe, Weak boundary solving and T-Snake on GVF.

## I. INTRODUCTION

Image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it. Image processing usually refers to digital image processing, but optical and analog image processing also are possible. This article is about general techniques that apply to all of them. The acquisition of images (producing the input image in the first place) is referred to as imaging [1]. In every research area they analyze the problem, mostly image analysis involves manipulating the image data to determine exactly the information necessary to help to solve a computer imaging problem. This analysis is typically part of a larger process which involves preprocessing, feature extraction, segmentation, remove noise data, etc. Image processing is done with the help of the digital image, which is captured from the digital format or satellite view, capturing the image are used to identify the problem in any fields. Capturing and analyzing image in image processing is the most important research area. Updating fields of the sea water research is an ongoing process of every research area through image processing sector.

Sea ice is formed with the result of seawater freezing based on the seasonal ice zone. In the seasonal ice zones, there are various types of sea ice floes of which the sizes range from about one meter to a few kilometers. The size distribution of ice floes plays an important role in the dynamical and thermo dynamical process of sea ice area as well as ice concentration and ice thickness [2]. Ice

thickness is transferred from atmosphere to ice varies depending on the ice floe size and the melting rate of ice floes depends on the ice floe size because the lateral melting becomes more significant for smaller ice floes. Therefore, it can be said that the ice floe distribution is a key parameter in the seasonal ice zones. The floe size distribution is a basic parameter of sea ice that affects the behavior of sea-ice extent, both dynamically and thermodynamically. Particularly for relatively small ice floes, it is critical to the estimation of melting rate. Hence, estimating floe size distributions contributes to the understanding of the behavior of the sea-ice extent on a global scale. In addition to this, the floe size distribution is also important in ice management for Arctic offshore operations. In addition, the size distribution and shape of ice floes possibly provide a clue to the understanding of ice floe formation processes [3]. It is generally noticed that the distribution of ice floe sizes does not have a characteristic size scale. The magnified figure of the partial ice area coincides almost with its original figure; that is, it has a self-similar feature. If this characteristic is confirmed in the ice area, it may give a suggestion on the ice formation process [4]. To separate connected sea-ice floes into individual floes, the watershed transform have to use. Manually removed these over-segmented lines, while those in automatically removed the over segmented lines whose endpoints were both convex. However, over- and under segmentation still affected the ice floe detection results. This method is operated on the binary images and focused on the morphological characteristics of ice floes rather than on the real boundaries [5]. To solve this problem, Topology adaptive snake algorithm was proposed on GVF to avoid manual interaction and reduce



# Medical Image Segmentation of Pancreas using D-Sift Algorithm

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**Abstract:** Analyzing the medical image in image processing is the most important research area. Capturing the image are analyzed to identify different medical imaging problems is the common factor in this field. Robust organ segmentation is a prerequisite for computer-aided diagnosis (CAD), quantitative imaging analysis, pathology detection and surgical assistance. Some of the organs in the human body have high anatomical variability, so segmentation of such organs is very complex. The proposed system segments the pancreas with the considerations of spatial relationships of splenic, portal and superior mesenteric veins with the pancreas. The proposed system uses macro super-pixels for fast and deep labeling and segmentation process. The proposed system is an automated bottom-up approach for pancreas segmentation with the consideration of spatial relationships with the veins in abdominal computed tomography (CT) scans. The method generates dynamic cascaded and macro super-pixel segmentation information's by classifying image patches at different resolutions. Fast organ analysis using Dense-SIFT algorithm.

**Keyword:** Image processing, medical image, pancreas segmentation, CT and Dense-SIFT algorithm.

## I. INTRODUCTION

Image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be moreover an image or a set of uniqueness or parameters linked to the image. The majority image-processing system involves treating the image as a two-dimensional signal and be appropriate standard signal-processing modus operandi to it. Image processing usually refers to digital image processing, but optical and analog image processing also are possible. This critique is about general modus operandi that apply to all of them. The acquisition of images (fabricate the input image in the first place) is referred to as imaging [1]. In every research area they analyze the problem, mostly image analysis involves maneuver the image data to conclude exactly the information compulsory to help to answer a computer imaging problem. This examination is typically part of a larger process which involves preprocessing, characteristic extraction, segmentation, remove noise data, etc. Image dispensation in medical image is a great critical task to find out the problems in the real world medical image. Image processing are done with the help of the digital image, which is captured from the digital format, capturing the image are used to identify the problem in the medical image. It is one of the common factor in this factual world they were many problems occurred to the people. Capturing their difference and analyzing the problem is the most critical task for these fields, most common factor in this field is to find out the problem in different areas such as brain, eye, abdomen, etc. In real world people were affected by many diseases, the most problematic area is the eye disease; without sight of people

they cannot do anything in their lonely time [2]. Segmentation of image is an important factor in image processing. This paper uses the pancreas analysis of medical image.

Segmentation of the pancreas is an important step in the development of computer aided diagnosis (CAD) systems that can provide quantitative examination for diabetic patients and a required input for subsequent methodologies for pancreatic cancer detection. Mechanical segmentation of plentiful organs in CT scans with high understanding such as the liver, heart and kidneys [3]. Segmentation of the pancreas, high precision in repeated segmentation remains a confront. The pancreas shows high anatomical deviation in shape, size and setting that change from patient to patient. The amount of visceral fat tissue in the closeness can drastically vary the boundary distinction as well. All these factors make pancreas limb segmentation very challenging [4]. It prevents many segmentation method from achieve high accuracies when evaluate to other segmentation of organs like the liver, heart or kidneys. freshly, the availability of large annotated schooling sets and the accessibility of reasonable parallel computing property via GPUs have made it feasible for "deep learning" methods such as convolutional networks (ConvNets) to be successful in image organization tasks. These methods have the gain that used classification features are trained straight from the imaging data. The pancreas segmentation in computed tomography (CT) images of the abdomen. The process is based on hierarchical coarse-to-fine organization of local image regions (superpixels). Superpixels are removed from the abdominal region by means of Simple Linear Iterative



# A Review on Relation between Dominating and Total Dominating Color Transversal Number of Graph and Monotonicity

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**ABSTRACT** – Domination is a very fast developing area in Graph Theory. This paper deals with combination of domination, total domination, proper colouring and transversal sets. Also demonstrate the domination transversal number for different types of graphs. We also extend some relation between domination and total domination colour transversal number of graphs. We also provide some examples to justify our results. We also obtain an upper bound of this number which increases monotonically.

**Keywords:** Domination, Total domination, Transversal sets, Proper colouring.

## 1. INTRODUCTION

Graphs are mathematical structures used to model pair-wise relations between objects from a certain collection. Graph can be defined a set  $V$  of vertices and set of edges. Where,  $V$  is collection of  $|V| = n$  abstract data types. Vertices can be any abstract data types and can be presented with the points in the plane. These abstract data types are also called nodes. A line (line segment) connecting these nodes is called an edge. Again, more abstractly saying, edge can be an abstract data type that shows relation between the nodes (which again can be an abstract data types).

Euler proposed that any given graph can be traversed with each edge traversed exactly once if and only if it had, zero or exactly two nodes with odd degrees. The graph following this condition is called, Eulerian circuit or path. We can easily infer this theorem. Exactly two nodes are, (and must be) starting and end of your trip. If it has even nodes than we can easily come and leave the node without repeating the edge twice or more. In actual case of seven bridges of Konigsberg, once the situation was presented in terms of graph, the case was simplified as the graph had just 4 nodes, with each node having odd degree. So, Euler concluded that

these bridges cannot be traversed exactly once.

## 2. DOMINATING COLOUR TRANSVERSAL NUMBER

An std-set  $D$  is minimal if and only if for every  $u \in D$  any one of the following holds:

- (i)  $u$  is an isolate of  $D$
- (ii) There exists a vertex  $v \in V - D$  such that  $N(v) \cap D = \{u\}$
- (iii) For every  $\chi$ -partition,  $\Pi = \{V_1, V_2, \dots, V_\chi\}$ , there exists one  $V_i$  such that  $V_i \cap D = \{u\}$  or  $\emptyset$ .

### Proof

Let  $D$  be an std-set. If  $D$  is minimal, then  $D - \{u\}$  is not an std-set for every  $u \in D$ .

This implies that either  $D - \{u\}$  is not a dominating set or not a transversal of every  $\chi$ -partition of  $G$ .

### Case 1:

Suppose  $D - \{u\}$  is not a dominating set. Then there exists a vertex  $v \in (V - D) \cup \{u\}$  that is not adjacent to any vertex of  $D - \{u\}$ .

If  $u = v$ , then  $u$  is an isolate of  $D$ . If  $u \neq v$ , then  $v$  is adjacent to  $u$  but not to any other vertex of  $D$ .

Hence  $N(v) \cap D = \{u\}$ .

### Case 2:

Suppose  $D - \{u\}$  is not a transversal for every  $\chi$ -partition  $\{V_1, V_2, \dots, V_\chi\}$ . This implies that  $D - \{u\} \cap V_i = \emptyset$  for some  $i$ . That is  $V_i \cap D = \{u\}$  or  $\emptyset$  for some  $i$ .

Hence (iii) is satisfied.

Conversely assume any one of the three conditions. We prove that  $D$  is a minimal std-set. Suppose not. Then  $D$  is an std-set but not minimal. This implies that  $D$  and  $D - \{u\}$  are std-sets for some  $u \in D$ .

# A Review on Domination Block Subdivision Graphs

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**ABSTRACT** –This paper, some result  $\gamma[BS(G)]$  were obtained in terms of vertices, edges and other different parameters of  $G$ . But not in terms of the numbers of  $BS(G)$ . In addition, we establish the relationship of  $\gamma[BS(G)]$  with other domination parameters of  $G$ . Also its relationship with other domination parameters were established.

**Keywords:** Domination sets, Block Subdivision, Edge Domination number, Connected Domination number.

## 1. INTRODUCTION

Graph theory is study of points and lines. In particular, it involves the ways in which sets of points, called vertices, can be connected by lines or arcs, called edges. Graphs in this context differ from the more familiar coordinate plots that portray mathematical relations and functions. Graph theory concerns the relationship among lines and points and some lines between them. No attention is paid to the position of points and the length of the lines. Dominating set other related subjects and the corresponding graph parameters form an important research area of graph theory, which is rich in history, application, interesting results and unsolved research questions. This is one of the fastest growing areas in Graph Theory.

## 2. DOMINATION SUBDIVISION NUMBERS OF GRAPHS

**Theorem:** For any connected graph  $G$  and edge  $uv$ , where  $\deg(u) \geq 2$  and  $\deg(v) \geq 2$ ,  $sd_r(G) \leq \deg(u) + \deg(v) - 1$ .

**Proof:**  $sd_r(G)$  is defined for every connected graph  $G$  of order  $n \geq 3$ . Every such graph  $G$  either has an edge  $uv$ , where  $\deg(u) \geq 2$  and  $\deg(v) \geq 2$ , or it does not. If  $G$  has such an edge  $uv$ , To shows that the domination number of  $G$  must increase if every edge incident to either  $u$  or  $v$  is subdivided. If  $G$  does not have such an edge, then for every edge  $uv$ , either  $\deg(u) = 1$  or  $\deg(v) = 1$ . But this implies that  $G$  is a star  $K_{1,n}$ . But for  $G = K_{1,n}$ , since  $n \geq 3$ , it is easy to see that the

domination number is increased by subdividing any edge, that is,  $sd_r(G) = 1$ .

Therefore,  $sd_r(G)$  is defined for every connected graph of order  $n \geq 3$ . Although the upper bound in this theorem for the subdivision number of an arbitrary graph is not a constant, it can be used to obtain a constant upper bound for the domination subdivision number of all graphs in some classes of graphs.

**Results :** 1. For any  $r \times s$  grid graph  $G_{r,s}$ ,  $1 \leq sd_r(G_{r,s}) \leq 4$ .  
2. For any  $k$ -regular graph  $G$ , where  $k \geq 2$ ,  $sd_r(G) \leq 2k-1$ .

**Theorem:** For any cubic graph  $G$ ,  $1 \leq sd_r(G) \leq 5$ .

**Proof:** A vertex which is adjacent to only one other vertex is called a leaf, and its neighbor is called a support vertex. A vertex which is adjacent to two or more leaves is called a strong support vertex.

**Theorem:** If  $G$  has a strong support vertex, then  $sd_r(G) = 1$ .

**Proof:** Let  $w$  be adjacent to leaves  $u$  and  $v$ . Subdividing either edge  $wu$  or  $wv$  will increase the domination number. Thus,  $sd_r(G) = 1$ .

**Theorem:** If  $G$  has adjacent support vertices, then  $sd_r(G) \leq 3$ .

**Proof :** Let  $w$  and  $x$  be adjacent support vertices, and let  $u$  and  $y$  be leaves adjacent to  $w$  and  $x$ , respectively. Subdividing edges  $wu$ ,  $wx$ , and  $xy$  will increase the domination number. Thus,  $sd_r(G) \leq 3$ .

We show that  $sd_r(G) = 1$  for any graph  $G$  having  $\gamma(G) = 1$ .

**Theorem:** If  $G$  is a graph of order  $n \geq 3$  and  $\gamma(G) = 1$ , then  $sd_r(G) = 1$ .

**Proof :** If you subdivide any edge in a graph of order  $n$  whose domination number equals one, the resulting graph cannot have domination number equal to one. We are able to

# A Review on Graphs with Unique Minimum Dominating Sets

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**ABSTRACT** – A dominating set for a graph  $G$  is a subset  $D$  of  $V$  such that every vertex not in  $D$  is adjacent to at least one member of  $D$ . This paper deals with some of the graphs having unique minimum dominating sets. We also find a unique minimum dominating sets for block graphs and maximum graphs.

**Keywords:** Domination sets, Block graphs, Unique  $\gamma$  set, Unique minimum Domination sets.

## 1. INTRODUCTION

Graphs can be used to model many types of relations and processes in physical, biological, social and information systems. Many practical problems can be represented by graphs. Emphasizing their application to real-world systems, the term network is sometimes defined to mean a graph in which attributes (e.g. names) are associated with the nodes and/or edges. In computer science, graphs are used to represent networks of communication, data organization, computational devices, the flow of computation, etc. For instance, the link structure of a website can be represented by a directed graph, in which the vertices represent web pages and directed edges represent links from one page to another. A similar approach can be taken to problems in social media, travel, biology, computer chip design, and many other fields. The development of algorithms to

handle graphs is therefore of major interest in computer science. The transformation of graphs is often formalized and represented by graph rewrite systems. Complementary to graph transformation systems focusing on rule-based in-memory manipulation of graphs are graph databases geared towards transaction-safe, persistent storing and querying of graph-structured data.

Graph theory is also used to study molecules in chemistry and physics. In condensed matter physics, the three-dimensional structure of complicated simulated atomic structures can be studied quantitatively by gathering statistics on graph-theoretic properties related to the topology of the atoms. In chemistry a graph makes a natural model for a molecule, where vertices represent atoms and edges bonds. This approach is especially used in computer processing of molecular structures, ranging from chemical editors to database searching.

In statistical physics, graphs can represent local connections between interacting parts of a system, as well as the dynamics of a physical process on such systems. Similarly, in computational neuroscience graphs can be used to represent functional connections between brain areas that interact to give rise to various cognitive processes, where the vertices represent different



# A Review on Domination in Planar Graphs with Small Diameter

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**ABSTRACT** – Domination and its variations in graphs are now well studied. However, the original domination number of a graph continues to attract attention. Many bounds have been proven and results obtained for special classes of graphs such as cubic graphs and products of graphs. On the other hand, the decision problem to determine the domination number of a graph remains NP-hard even when restricted to cubic graphs or planar graphs of maximum degree 3. In this paper we consider the domination of planar graphs with small diameter.

**Keywords:** Domination Number, Planar graph, Diameter Graph, Domination set.

## 1. INTRODUCTION

Domination and its variations in graphs are now well studied. However, the original domination number of a graph continues to attract attention. Many bounds have been proven and results obtained for special classes of graphs such as cubic graphs and products of graphs. On the other hand, the decision problem to determine the domination number of a graph remains NP-hard even when restricted to cubic graphs or planar graphs of maximum degree 3. Hence it is of interest to determine upper bounds on the domination number of a graph.

In this paper we consider the domination of planar graphs with small diameter. It is trivial that a tree of radius 2 and diameter 4 can have arbitrarily large domination number. So the interesting question is what happens when the diameter is 2 or 3.

MacGillivray and Seyffarth “Domination numbers of planar graphs” proved that planar graphs with diameter two or three have bounded domination numbers. In particular, this implies that the domination number of such a graph can be determined in polynomial time. On the other hand, they observed that in general graphs with diameter 2 have unbounded domination number.

We show that there is a unique planar graph of diameter 2 with domination number 3. Hence every planar graph of diameter 2, different from this unique planar graph, has domination number at most 2. We then prove that every planar graph of diameter 3 and of radius 2 has domination number at most 6. We then show that every sufficiently large planar graph of diameter 3 has domination number at most 7.

**Theorem :** Every planar graph of diameter 2 has domination number at most 2 except for the graph  $F$  of Figure 3.1 which has domination number 3.

**Proof :** To prove Theorem, suppose  $G$  is a planar graph of diameter two satisfying  $\gamma(G) > 2$ . If  $a$  and  $b$  are two vertices in  $G$ , then there is always a vertex not dominated by  $\{a, b\}$ . We Shall denote one such vertex by  $v_{ab}$ . Fix an embedding  $G^*$  of  $G$  in the plane.

From the Jordan Closed Curve Theorem, we Know that a cycle  $C$  in  $G^*$  separates the plane into two regions, which we call the sides of  $C$ . Vertices of different sides of  $C$  are said to be separated by  $C$ . The side of  $C$  that consists of the unbounded region we call the outside of  $C$ , while the side of  $C$  that consists of the bounded region we call the inside of  $C$ . If  $C$  has length  $n$  and there are vertices both inside and outside  $C$ , then we say that  $C$  is a cut- $n$ -cycle. A cut-3-cycle is also called a cut-triangle. Since a cut-set dominates a graph of diameter 2, it follows that  $G$  is 3-connected; therefore  $G$  has an essentially unique embedding in the plane and so we may speak of cut-cycles of  $G$  rather than of  $G^*$ , lemma3.1.2 establishes the existence of a 4-cycle. Then we show that this cycle is neither both induced and dominating, nor both non-induced and dominating, and therefore not dominating. Finally, we show that it follows that  $G$  is isomorphic to  $F$ .

## 2. DOMINATION IN PLANAR GRAPHS WITH SMALL DIAMETER II

The domination number of  $G$ , denoted by  $\gamma(G)$ , is the minimum cardinality of a dominating set, while the total domination number of  $G$ , denoted by  $\gamma_t(G)$ , is the minimum

# A Review on Relationship between Domination, Independent Transversal Domination and Equitable Domination in Graphs

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**ABSTRACT** – A set  $S \subseteq V$  of vertices in a graph  $G = (V, E)$  is called a dominating set if every vertex in  $V - S$  is adjacent to a vertex in  $S$ . A dominating set which intersects every maximum independent set in  $G$  is called an independent transversal dominating set. In this paper we begin an investigation of relationship between domination, independent transversal domination and equitable domination in graphs.

**Keywords:** Dominating set, independent set, independent transversal dominating set, equitable dominating set.

## 1. INTRODUCTION

One of the fastest growing areas within graph theory is the study of domination, independent transversal dominating set, equitable dominating set and related subset problems such as independence, covering and matching. An independent dominating set  $S$  is a dominating set such that  $S$  is an independent set. The independent domination number  $i(G)$  is the minimum cardinality of an independent dominating set. The maximum cardinality of an independent set is called the independence number and is denoted by  $\beta_0(G)$ . A subset  $D$  of  $V(G)$  is called an equitable dominating set of a graph  $G$  if for every  $u \in (V - D)$ , there exists a vertex  $v \in D$  such that  $uv \in E(G)$  and  $|deg(u) - deg(v)| \leq 1$ . The minimum cardinality of such a dominating set is denoted by  $\gamma_e(G)$  and is called equitable domination number of  $G$ . An equitable dominating set which intersects every maximum independent set in  $G$  is called an independent transversal equitable dominating set. The minimum cardinality of an independent transversal equitable dominating set is called the independent transversal equitable domination number of  $G$  and is denoted by  $\gamma_{ite}(G)$ .

## 2. INDEPENDENT TRANSVERSAL DOMINATION IN GRAPHS

**Theorem :** For any graph  $G$ , we have  $\gamma(G) \leq \gamma_{it}(G) \leq \gamma(G) + \delta(G)$ .

**Proof:** Since an independent transversal dominating set of  $G$  is a dominating set, it follows that  $\gamma(G) \leq \gamma_{it}(G)$ . Now, let  $u$  be

a vertex in  $G$  with  $deg u = \delta(G)$  and let  $S$  be a  $\gamma$ -set in  $G$ . Then every maximum independent set of  $G$  contains a vertex of  $N[u]$  so that  $S \cap N[u]$  is an independent transversal dominating set of  $G$ . Also, since  $S$  intersects  $N[u]$ , it follows that  $|S \cap N[u]| \leq \gamma(G) + \delta(G)$  and hence the right inequality follows.

**Theorem:** If  $G$  is a graph with  $diam G = 2$ , then  $\gamma_{it}(G) \leq \delta(G) + 1$ .

**Proof:** Let  $u$  be a vertex with  $deg u = \delta(G)$ . Then  $N[u]$  is a dominating set of  $G$ , because  $diam G = 2$ .

Now, it follows from the fact that every maximum independent set contains a vertex of  $N[u]$ . This closed neighborhood itself is an independent transversal dominating set so that  $\gamma_{it}(G) \leq \delta(G) + 1$ .

**Theorem:** Let  $G$  be a bipartite graph with bipartition  $(X, Y)$  such that  $|X| \leq |Y|$  and  $\gamma(G) = |X|$ . Then  $\gamma_{it}(G) = \gamma(G) + 1$  if and only if every vertex in  $X$  is adjacent to at least two pendant vertices.

**Proof:** We first claim that  $\delta(G) = 1$ . Suppose  $\delta(G) \geq 2$ . Since  $\gamma(G) = |X|$ ,  $X$  is a  $\gamma$ -set. Also, since  $\gamma_{it}(G) = \gamma(G) + 1$  it follows that  $\beta_0(G) = |Y|$ . Now, let  $u \in X$  and  $v \in N(u)$ . Since  $\beta_0(G) \geq 2$ , it follows that  $S = (X - \{u\}) \cup \{v\}$  is a dominating set of  $G$ . Now since  $\beta_0(G) = |Y|$  and  $\delta(G) \geq 2$ , every  $\beta_0$ -set contains either the vertex  $v$  or a vertex  $w \neq u$  in  $X$ . Hence  $S$  intersects every  $\beta_0$ -set so that  $\gamma_{it}(G) = |X| = \gamma(G)$ , which is a contradiction. Thus  $\delta(G) = 1$ . Further suppose there exists a vertex  $u$  in  $X$  such that  $N(u)$  contains at most one pendant vertex. Then  $S = (X - \{u\}) \cup \{v\}$ , where  $v \in N(u)$ , and  $v$  is chosen to be a pendant vertex if it exists, is a dominating set of  $G$ . Also since  $\beta_0(G) = |Y|$ , it follows that  $S$  intersects every  $\beta_0$ -set of  $G$  and hence  $\gamma_{it}(G) \leq |X| = \gamma(G)$ , which is a contradiction. Thus every vertex in  $X$  is adjacent to at least two pendant vertices. Conversely, if every vertex in  $X$  is adjacent to at least two pendant vertices, then  $X$  is the only  $\gamma$ -set of  $G$  so that  $\gamma_{it}(G) = \gamma(G) + 1$ .

# A Review on Rainbow Edge Colouring and Rainbow Domination

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**ABSTRACT** – In graph theory Edge coloured graph which has the distinct coloured edges are well studied. An Edge coloured graph is  $t$ -tolerant if it contains no monochromatic star with  $t+1$  edges. In this paper we consider optimal edge coloured complete graphs. We show that in any optimal edge colouring of the complete graph  $K_n$ , Also we prove that in every proper edge colouring of the complete graph  $K_n$ .

**Keywords:** Rainbow Cycle, edge coloring, edge chromatic number, Hamilton cycle.

## 1. INTRODUCTION

An edge-colored graph is rainbow if its edges have distinct colors. Rainbow edge-colored graphs have also been called heterochromatic, polychromatic, or totally multicolored. Within an edge-colored graph  $G$ , we consider covering the edges by rainbow matchings or covering the vertices by disjoint rainbow stars.

The existence of a Hamilton cycle with many colors, also the existence of a Hamilton cycle with few colors in any proper edge coloring of a complete graph. A rainbow cycle is a cycle whose all edges have different colors. Given an optimally edge colored complete graph with  $n$  vertices, we study the number of colors appearing on its cycles.

The rainbow connection number can be motivated by its interesting interpretation in the area of networking. This new concept comes from the communication of information between agencies of government.

Consider a network  $G$  (e.g., a cellular network). To route messages between any two vertices in a pipeline, assign a distinct channel to each link (e.g., a distinct frequency). We need to minimize the number of distinct channels that we use in the network.

The minimum number of distinct channels is called the rainbow connection number and is denoted by  $rc(G)$ . Let

$G$  be an edge-colored graph with  $n$  vertices. A rainbow subgraph is a subgraph whose edges have distinct colors. The rainbow edge-chromatic number of  $G$ , written  $\tilde{\kappa}(G)$ , is the minimum number of rainbow matchings needed to cover  $E(G)$ . An edge-colored graph is  $t$ -tolerant if it contains no monochromatic star with  $t+1$  edges.

## 2. RAINBOW EDGE COLOURING AND RAINBOW DOMINATION

If  $G$  is  $t$ -tolerant, then  $\tilde{\kappa}(G) < t(t+1)n \ln n$ , and examples exist with  $\tilde{\kappa}(G) \geq t/2(n-1)$ . The rainbow domination number, written  $\tilde{\gamma}(G)$ , is the minimum number of disjoint rainbow stars needed to cover  $V(G)$ . For  $t$ -tolerant edge-colored  $n$ -vertex graphs, we generalize classical bounds on the domination number:  $\tilde{\gamma}(G) \leq \frac{1+tn}{k}n$  (where  $k = \frac{\delta(G)}{t} + 1$ ) and  $\tilde{\gamma}(G) \leq \frac{t}{t+1}n$  when  $G$  has no isolated vertices.

**Theorem:** There exist infinitely many  $t$ -tolerant edge-colored graphs  $G$  such that  $\tilde{\kappa}(G) \geq \frac{t}{2}(|V(G)| - 1) = \frac{t}{2}\Delta(G)$ .

**Proof:** For  $t, p \in \mathbb{N}$ , start with a proper  $tp$ -edge-coloring of  $K_{tp}$ . Obtain a  $t$ -tolerant edge-colored graph  $G$  by combining  $t$ -tuples  $s$  of color classes into single colors.

$$\begin{aligned} \text{In } G \text{ there are only } p \text{ colors, so } \tilde{\kappa}(G) &\leq p. \\ \text{Hence } \tilde{\kappa}(G) &\geq \frac{1}{p}|E(G)| \\ &\geq \frac{t}{2}(tp-1) \\ &= \frac{t}{2}(|V(G)| - 1) \\ &= \frac{t}{2}\Delta(G). \end{aligned}$$

**Theorem:** When  $n \equiv 2 \pmod{4}$ , there is an edge-colored graph  $G$  such that  $\tilde{\kappa}(G) > \Delta(G) + 1$  and  $G$  is a proper  $n$ -edge-coloring of  $K_{n,n}$ .

**Proof:** As noted earlier, proper  $n$ -edge-colorings of  $K_{n,n}$  correspond to Latin squares of order  $n$ . Each rainbow matching corresponds to a partial transversal of the Latin



# A Review on Global Domination Number of a Graph

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**ABSTRACT** – A dominating set is called a global dominating set if it is a dominating set for a graph  $G$  and its complement  $\bar{G}$ . We investigate some general results for global dominating sets corresponding to the graphs  $P_n$ . In the present work we investigate some general results which relate the concept of global domination and duplication of a vertex. In this paper sharp bounds for  $\gamma_{gr}$ , are supplied for graphs whose girth is greater than three. Exact values of this number for paths and cycles are presented as well.

**Keywords:** Domination, global domination, global sets domination, global neighborhood domination.

## 1. INTRODUCTION

Graph theory can be defined as the study of graphs. Graphs are mathematical structures used to model pair-wise relations among objects from a certain collection. Graph can be defined as a set  $V$  of vertices and set of edges. Where  $V$  is collection of  $|V| = n$  abstract data types. Vertices can be any abstract data types and can be represented with the points in the plane. These abstract data types are also called nodes. A line segment connecting these nodes is called an edge. Again, more abstractly saying, edge can be abstract data type that shows relation among the nodes.

In this document, I would briefly go over through how and what led to the development of the graph theory which revolutionized the way to many complicated problems to be solved.

The “Konigsberg bridge” problem originated in the city of Konigsberg, formerly in the Germany but, now known as Kaliningrad and part of Russia, located on the river Preger. The city had seven bridges, which connected two island with the main land Via seven bridges. People staying there always wondered whether was there any way to walk over all the bridges once and only once and return to the starting place. The below picture is the map of Konigsberg during Euler’s time showing the actual layout of the seven bridges, highlighting the river Preger and the bridges.

## 2. THE GLOBAL DOMINATION NUMBER OF A GRAPH

**Theorem:** (i) For a graph  $G$  with  $p$  vertices,  $\gamma_g(G) = p$  if and only iff  $G = K_p$  or  $\bar{K}_p$ .

(ii)  $\gamma_g(K_{m,n}) = 2$  for all  $m, n \geq 1$

(iii)  $\gamma_g(C_4) = 2, \gamma_g(C_5) = 3$  and  $\gamma_g(C_n) = \lfloor n/3 \rfloor$  for all  $n \geq 6$ .

(iv)  $\gamma_g(P_n) = 2$  for  $n=2, 3$  and  $\gamma_g(P_n) = \lfloor n/3 \rfloor$  for all  $n \geq 4$ .

**Proof:** We prove only (i) and (ii)-(iv) are obvious. Clearly,  $\gamma_g(K_p) = \gamma_g(\bar{K}_p) = p$ . Suppose  $\gamma_g(G) = p$  and  $G = K_p, \bar{K}_p$ . Then  $G$  has at least one edge  $uv$  and a vertex  $w$  not adjacent to  $u, v$ . Then  $V - \{v\}$  is a global dominating set and  $\gamma_g(G) \leq p - 1$ . For some graphs including trees,  $\gamma_g$  is at most equal to  $\gamma$ .

**Theorem:** Let  $S$  be a minimum dominating set of  $G$ . If there exists a vertex  $v$  in  $V - S$  adjacent to only vertices in  $S$ , then  $\gamma_g \leq \gamma + 1$

**Proof:** This follows since  $S \cup \{v\}$  is a global dominating set.

**Theorem:** For a  $(p, q)$  graph  $G$  without isolates.

$(2q - p(p-3)) / 2 \leq \gamma_g \leq p - \beta_0 + 1$

**Proof:** Let  $S$  be a minimum global dominating set.

Then every vertex in  $V - S$  is not adjacent to at least one vertex in  $S$ . This implies  $q \leq (p/2) - (p - \gamma_g)$  and the lower bound  $(2q - p(p-3)) / 2 \leq \gamma_g \leq p - \beta_0 + 1$  follows. To establish the upper bound, let  $B$  be an independent set with  $\beta_0$  vertices. Since  $G$  has no isolates,  $V - B$  is a dominating set of  $G$ . Clearly, for  $v \in B, (V - B) \cup \{v\}$  is a global dominating set of  $G$ , and upper bound follows. Since  $\alpha_0 + \beta_0 = p$  for any graph of order  $p$  without isolates, We have from  $(2q - p(p-3)) / 2 \leq \gamma_g \leq p - \beta_0 + 1$ .

## 3. THE GLOBAL SET - DOMINATION NUMBER OF A GRAPH

**Theorem:** In a tree  $T$  with  $p$  vertices and  $e$  end vertices, that is not a star, the set of non end vertices forms a minimum global set domination-set and  $\gamma_{sg} = p - e$

**Proof:** It is known that the set  $D$  of all cut vertices of  $T$  forms a  $\gamma_s$  set of  $T$  and  $\gamma_s = p - e$ . Clearly, the sub graph  $\langle V(T) -$

# A Review on Lower Bounds for the Domination Number

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**ABSTRACT** – We prove several Lower bounds on the domination number of simple connected graph. In this paper we prove that  $(2k+1) \gamma_k(T) \geq |v| + 2k - kn_1$  for each tree.  $T=(V,E)$  with  $n_1$  leafs, and we characterize the class of tree that satisfy the equality  $(2k+1) \gamma_k(T) \geq |v| + 2k - kn_1$ .

**Keywords:** Domination, Distance domination number, Tree.

## 1. INTRODUCTION

Domination in graphs has been studied extensively in recent years. The study of domination in graphs originated around 1850 with the problems of placing minimum number of queens on an  $n \times n$  chessboard so as to cover or dominate every square. With very few exceptions these problems still remain unsolved today. The theory of domination in graphs introduced by Ore and Berge is an emerging area of research in graph theory today

Berge presents the problem of five queens, namely, place five queens on the chess board so that every square is covered by at least one queen. The solution to these problems are nothing but dominating sets in the graph, whose vertices are the queens of the chessboard and vertices  $u,v$  are adjacent if a queen move from  $u$  to  $v$  in one move. This leads to domination in graphs.

## 2. APPLICATION OF GRAPH THEORY

Graph theoretical concepts are widely used to study and model various applications, in different areas. They include, study of molecules, construction of bonds in chemistry and the study of atoms. Similarly, graph theory is used in sociology for example to measure actors prestige or to explore diffusion mechanisms.

Graph theory is used in biology and conservation efforts where a vertex represents regions where certain species exist and the edges represent migration path or movement between the regions. this information is important when looking at breeding patterns or tracking the spread of disease, parasites and to study the impact of migration that affect other species. Graph theoretical concepts are widely used in Operations Research. For example, the travelling salesman problem, the shortest spanning tree in a weighted graph, obtaining an optimal match of jobs and men and locating the shortest path between two vertices in a graph. It is also used in modeling transport networks, activity networks and theory of games.

The network activity is used to solve large number of combinatorial problems. The most popular and successful applications of networks in OR is the planning and scheduling of large complicated projects. The best well known problems are PERT(project Evaluation Review Technique)and CPM(Critical Path Method). Next, Game theory is applied to the problems in engineering, economics and war science to find optimal way to perform certain tasks in competitive environments to represent the method of finite game a digraph is used. Here, the vertices represent the positions and the edges represent the moves. Everything in our world is linked cities are linked by street, rail and flight networks. Pages on the internet are linked by hyperlinks. The different components of an electric circuit or computer chip are connected and the paths of disease outbreaks form a network. Scientists, engineers and many others want to analyze, understand and optimize these networks. And this can be done using graph theory. For example, mathematicians can apply graph theory to road networks, trying to find a way to reduce traffic

# Changing and Unchanging Domination in Fuzzy Graph

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**Abstract** - In this paper the concepts of Changing and unchanging domination in Fuzzy Graph and for some standard theorems and examples are discussed.

**Keywords** - domination in fuzzy graph, changing domination in graph, unchanging domination in graph, changing and unchanging domination in fuzzy graphs.

## I. INTRODUCTION

The study of domination set in graphs was begun by [5]V.R. Kulli and Bidarhali Janakiram (2004). The domination in fuzzy graph discussed by the [1]A. NagoorGani, and V.T.Chandrasekaran.(2006). [2] A.Somasundaram, S.Somasundaram, "Domination in fuzzy Graphs I"(1998), Domination alternation sets in graphs discussed by the [3] D. Bauer, F. Harary, J. Nieminen, S.L. Suffèr, changing and unchanging domination in graph [4] J.R.Carrington, F.Harary, T.W.Haynes, changing and unchanging domination in fuzzy graphs  $G(V, \rho, \mu)$  of  $\gamma(G)$ .

## II. PRELIMINARIES

A **fuzzy graph**  $G = \langle \sigma, \mu \rangle$  is a set with two function  $\sigma: V \rightarrow [0,1]$  and  $\mu: E \rightarrow [0,1]$  such that  $\mu(x, y) \leq \sigma(x) \wedge \sigma(y)$  for all  $x, y \in V$ . hereafter we write  $\mu(x, y)$  or  $\mu(xy)$ . A fuzzy graph  $H = \langle \tau, \rho \rangle$  is called a **fuzzy subgraph** of  $G$  if  $\tau(v_i) \leq \sigma(v_i)$  for all  $v_i \in V$  and  $\rho(v_i, v_j) \leq \mu(v_i, v_j)$  for all  $v_i, v_j \in V$ .

A subset  $S$  of  $V$  is called a **dominating set** in  $G$  if for every  $v \notin S$ , there exists  $u \in S$  such that  $u$  dominates  $v$ . The minimum fuzzy cardinality of a dominating set in  $G$  is called the **domination number** of  $G$  and is denoted by  $\gamma(G)$  or  $\gamma$ .

A dominating set  $S$  of a fuzzy graph  $G$  is said to be a minimal dominating set if no proper subset of  $S$  is a dominating set of  $G$ .

The removal of an edge from a graph  $G$  can increase by the domination number by at most one and cannot decrease the domination number.  $\gamma(G - e) = \gamma(G) + 1$ .

The removal of a vertex from a graph  $G$  can increase by the domination number by at most one and cannot decrease the domination number.  $\gamma(G - v) = \gamma(G) + 1$

Domination color transversal **bondage number** of a graph  $G$  denoted by  $b_{\sigma\tau}$  is defined to be the minimum cardinality of collection of sets  $E' \subseteq E$  such that  $\gamma_{\sigma\tau}(G) = \gamma(G - E')$ . If  $b_{\sigma\tau}$  is not defined for  $K_1$  and  $K_2$ .

A graph for which the domination number changes when an **vertex is removal (CVR)** has  $V = V^- \cup V^+$  Observed  $V^0$  is never empty for a tree, hence, no tree is in CVR.

$V^0 = \{ v \in V; \gamma(G - V) = \gamma(G) \}, V^+ = \{ v \in V; \gamma(G - V) > \gamma(G) \}, V^- = \{ v \in V; \gamma(G - V) < \gamma(G) \}$

The domination number is unchanged when an arbitrary **vertex is removed class UVR**, then  $V = V^0$ .

## III. CHANGING and UNCHANGING DOMINATION in FUZZY GRAPH



# Changing and Unchanging Domination in Fuzzy Graph

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The removal of a vertex from a graph  $G$  can increase by the domination number by at most one and cannot decrease the domination number.  $\gamma(G - v) = \gamma(G) + 1$

Domination color transversal **bondage number** of a graph  $G$  denoted by  $b_{st}$  is defined to be the minimum cardinality of collection of sets  $E' \subseteq E$  such that  $\gamma_{st}(G) = \gamma(G - E')$ . If  $b_{st}$  is not defined for  $K_1$  and  $K_2$ .

A graph for which the domination number changes when an **vertex is removal (CVR)** has  $V = V^- \cup V^+$  Observed  $V^0$  is never empty for a tree, hence, no tree is in CVR.

$V^0 = \{ v \in V; \gamma(G - v) = \gamma(G) \}, V^+ = \{ v \in V; \gamma(G - v) > \gamma(G) \}, V^- = \{ v \in V; \gamma(G - v) < \gamma(G) \}$

The domination number is unchanged when an arbitrary vertex is removed class **UVR**, then  $V = V^0$ .

## III. CHANGING and UNCHANGING DOMINATION in FUZZY GRAPH

# Extraction of Top K Itemsets From High Utility Itemsets Using Faster High-Utility Itemset Miner

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## ABSTRACT

Frequent itemset mining is the recent research topic in the data mining systems. It generally composes of tremendous volume of frequently searched/retrieved item with low/ high itemset values. This dilemma doesn't satisfy the user's requirements. The utility itemsets is an important topic and it can be measure in terms of weight, value, quantity and all other information's depending on the user's requirements. If the utility itemset is no less than user specified min utility, so this itemset is called a utility of high itemset. It contains a many applications like biomedicine, mobile computing, market analysis, etc. In database, the HUI is a difficult, because in FIM used the downward closer property is does not hold the utility of itemsets. Superset the low utility itemset can be a high utility so the HUI pruning search space is also difficult. To overcome this issue, we discovered fittest threshold for mining the relevant itemsets from set of itemsets. Setting of min-util value to the user is a daunting task. In order to find an efficient threshold value for the users, the behaviors of the users are studied. In this work, we proposed two mechanisms, namely, mining top k utility itemsets and mining top k utility itemsets in single phase in which k is the number of covered HUI mining. Initially, we give an auxiliary examination of the two calculations with talks on their preferences and restrictions. Exact assessments on both genuine and manufactured datasets demonstrate that the execution of the proposed calculations is near that of the ideal instance of best in class utility mining calculations.

**Keywords:** Cloud computing, Cloud security, Peer to Peer, Resource Description Framework.

## I. INTRODUCTION

Data mining is the field of our study. The applications of data mining are tremendously growing due to the growth of information technologies. In general context, data mining is explained as follows:

- (i) Extracting the relevant knowledge from the set of unidentified or identified set of resources.
- (ii) The formation of meaningful pattern by exploring the data in a hyperplane system.

The real world data may be in structured or unstructured form. The main objective of the work is to find the relations or similarity between the data for deriving useful knowledge. The behavior of data implies lot of information from its elementary form. It also plays a vital role in the data analysing process. It authorizes users to analyze data from several diverse dimensions or angles, categorize it, and sum up the relationships acknowledged.

Several users make use of data mining for discovering the knowledge from variant aspects. In some cases, knowledge discovery is a developmental step in the

# Distributed Intrusion Detection System for Cognitive Radio Networks Based on Weighted Fair Queuing Algorithm

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## ABSTRACT

Reliable detection of intrusion is the basis of safety in cognitive radio networks (CRNs). So far, few scholars applied intrusion detection systems (IDS) to combat intrusion against CRNs. In order to improve the performance of intrusion detection in CRNs, a distributed intrusion detection scheme has been proposed. In this paper, a method base on Dempster-Shafer's (DS) evidence theory to detect intrusion in CRNs is put forward, in which the detection data and credibility of different local IDS Agent is combined by D-S in the cooperative detection center, so that different local detection decisions are taken into consideration in the final decision. The effectiveness of the proposed scheme is verified by simulation, and the results reflect a noticeable performance improvement between the proposed scheme and the traditional method.

**Keywords :** Safety, cognitive radio networks, intrusion detection, IDS Agent, cooperative detection center, Dempster-Shafer's evidence theory

## I. INTRODUCTION

### 1.1 INTRODUCTION ABOUT TO IDS

#### 1.1.1 IDS Defined

Intrusion detection is the process of identifying computing or network activity that is malicious or unauthorized. Most all Intrusion Detection Systems (IDS) have a similar structure and component set. This consists of a sensor (or agent) that monitors one or more data sources, applies some type of detection algorithm, and then initiates zero or more responses. Usually there is a management system that provides for monitoring, configuration and analysis of intrusion data.

#### 1.1.2 Evolution of IDS

The first IDS were host-based, and looked at system operating logs performing simple pattern matches

against a small set of signatures. This approach quickly expanded to systems that looked at network traffic, initially also for simple patterns. As IDS gained a level of protocol-awareness, they were able to look for certain single packet traffic types known to be malicious, examining the source and destination IP addresses, along with source and destination ports. Further sophistication brought an awareness of network sessions and the ability to examine dialogs between systems for multi-packet activity. More recent IDS can examine and respond to entire conversations between hosts, using knowledge of protocols and network sessions to analyze traffic for malicious activity based on how that traffic would appear at the destination-a task often requiring specialized network drivers to operate at full wire-speed (For a good discussion of the evolution and genealogy of IDS, see article by Inella). The emerging class of IDS take this one step



# A Novel Approach for Detecting and Matching Iris Crypts For Human Recognition System

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## ABSTRACT

In a variety of applications, the iris is a secure biometric feature that has been extensively employed for human recognition. Though, exploitation of iris recognition in forensic applications has not been informed. A most important cause is being deficient in of human friendly approaches for comparing with iris. Additionally to endorse the utilization of iris recognition in forensics, the resemblance between irises be supposed to made visualizable and understandable. In recent times, a system was proposed, known as “a human-in-the-loop iris recognition system” which was based on detecting and matching iris crypts. Structuring on this system, a new approach for detecting and matching iris crypts automatically is proposed in this work. This detection method is capable to capture iris crypts of different sizes. This matching method is considered to handle possible topological modifications in the detection of the similar crypt in diverse images. This approach does better the well-known visible-feature-based iris recognition method on three dissimilar data sets. Subsequent to iris Crypts detection, Iris images were in use prior to and later than the treatment of eye disease and the outcome illustrates the mathematical divergence accomplished from treatment. Gabor filter is employed to extract the features. This iris recognition was efficiently endured with the majority of ophthalmic disease e.g. corneal oedema, iridotomies and conjunctivitis etc. This developed iris recognition be supposed to employed for resolving the potential issues that might reasonable in key biometric technology and medical diagnosis.

**Keywords:** Iris Recognition, Forensics, Human-In-The-Loop, Eye Pathology, Ophthalmic Disease, Iridotomies, Conjunctivitis, Visible Feature, Corneal Oedema.

## I. INTRODUCTION

Based on biometrics the demand for automated personal identification system has increased with a growing prominence in security. Because the conventional (cards or passwords based) can be broken by stealing cards and forgetting passwords. Thus, there is a requirement for identification systems identify humans which is independent on what person possesses or what person remembers. Biometrics can be separated into two main divisions: physiological and behavioral. The physiological class

is associated to the shape of the body which contains fingerprint, face recognition, palm print, hand geometry, and iris recognition. The behavioral class is associated to the behavior of a person and contains typing rhythm and voice.

In recent times, iris recognition is fetching one of the most vital biometrics employed in recognition when imaging can be performed at distances below two meters. This significance is because of its high reliability for individual identification. Human iris has enormous mathematical advantage that its

# Distributed Intrusion Detection System for Cognitive Radio Networks Based on Weighted Fair Queuing Algorithm

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## ABSTRACT

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**Keywords :** Safety, cognitive radio networks, intrusion detection, IDS Agent, cooperative detection center, Dempster-Shafer's evidence theory

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# Fuzzy Based Genetic Operators for Cyber Bullying Detection Using Social Network Data

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## ABSTRACT

Social media getting more and more popular in our day today life. By the popularity of the social media affects the people who involving into it. This makes the technology to work or to feel smarter and makes us lazier. On resulting to this robust and discriminative numerical representation learning of text messages is a critical issue. Hence here we propose a learning method to tackle this issue which is named as Semantic Enhanced Marginalized Denoising Auto Encoder (smsda). Semantic extension of the popular deep learning model stacked denoising auto encoder plays a major role in this method whereas semantic extension consists of semantic dropout noise and sparsity constraints. The semantic dropout noise is designed based on domain knowledge and the word embedding technique. Our proposed method is able to exploit the hidden feature structure of bullying information and learn a robust and discriminative representation of text. Comprehensive experiments on two public cyber bullying corpora (Twitter and myspace) are conducted, and the results show that our proposed approaches outperform other baseline text representation learning methods.

**Keywords:** Semantic Enhanced Marginalized Denoising Auto-Encoder, cyberbullying.

## I. INTRODUCTION

Internet has become very popular and used around the world in our day to day life. By the growing of internet the cyber security is becoming the most important factor. Currently web 2.0 allows us to access the online related services and some users have been affected by the cybercrimes like cyber bullying experiences internationally. By these kinds of issues the growth of social media gets the negative impacts from the various users. We propose an effective predator and victim identification with semantic enhanced marginalized denoising auto-encoder approach to detect cyber-bullying message from social media through the weighing scheme of feature of selection. We present Model to extract the

cyber bullying network, which is used to identify the most active cyber bullying predators and victims to ranking algorithms the existing filters generally work with the simple key word search and are unable to understand the Semantic meaning of the text. So we propose Semantic Enhanced Marginalized Denoising Auto-Encoder.



# A Novel Approach for Fingerprint Liveness Detection Using Gradient and Texture Features

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## ABSTRACT

Fingerprints are good basis for individual identification by biometric authentication. Password based authentication systems are less secure than that of the fingerprint authentication where fingerprints and Iris are unique for every Individual. With the emerging use of biometric authentication systems in the past years, spoof fingerprint detection has become increasingly important. In this paper, we propose a static software approach that combines all sorts of fingerprint features. Initially, we extract the features of the fingerprint image using Gabor wavelet feature process. The extracted features are then aligned with histogram process. Each extracted features are preserved with dynamic score level integration. This dynamic approach consumes higher computational time. It has been experimented on the LivDet 2011 dataset which proves the efficiency of our proposed system. These have shown the classification rate of 9.625% with reduced error rate of 2.27%.

**Keywords:** Fingerprint liveness, low level features, Gabor filters, texture analysis, Biometric Security.

## I. INTRODUCTION

Biometrics is burlier authentication system in the domain of security. Fingerprints are intrinsic to persons and can neither be lost nor stolen which makes it highly truthful and trustworthy. Furthermore, the accessibility of low-cost fingerprint readers united with easy integration capabilities has led to the broad spread use of fingerprint biometrics in a diversity of organizations. An organization can have unlimited benefits by appropriately deploying biometric technology. Today's economy is a developing one and technological progressions have altered the system in which organizations function and conduct businesses. Recent organizations require being adaptive, flexible and responsive to endure in the competitive business surroundings. Fingerprint technology can promote organizations in a diversity

of segments e.g. health care, government, retail enterprises, technology organizations, manufacturing industry, libraries, universities etc Employee identification and workforce management becomes faster, exact and more proficient with fingerprint technology [1]. Different magnetic strip cards or passwords, individuals constantly carry their fingerprints with them and they cannot be misplaced or elapsed. Tracking attendance of employees in industrialized organizations checks employee time thievery and diminish deceptive behavior. A biometric system facilitate automated calculation of employee hours therefore sinking paper expenditure and time exhausted in manual settlement of attendance data.

Fingerprint biometrics can give both physical access to company buildings and logical access to internal



# Preparation and Characterization of Al doped SnO<sub>2</sub> Nanocrystalline Thin Films by Spray Pyrolysis Technique

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**Abstract:** Al-doped Tin Oxide (SnO<sub>2</sub>) nanostructured (ATO) thin films are prepared by Spray Pyrolysis technique on glass substrates Prepared at 400°C and annealed at 500°C, 600°C. Using a solution consisting of SnCl<sub>4</sub>·5H<sub>2</sub>O starting material and doping source was AlCl<sub>3</sub> with various Al doping ratio. Sn<sub>1-x</sub>Al<sub>x</sub>O<sub>2</sub> (x = 0.04, 0.06 and 0.08) were dissolved in ethanol and stirred four hours at 50°C. The effect of changes in doping content and annealing effect of Al:SnO<sub>2</sub> nanostructured thin films was investigated. The result of X-ray diffraction has shown that peak located at around 2θ = 37.9° is corresponding to (200) plane which confirmed the presence of SnO<sub>2</sub> in tetragonal crystal system. All the observed characteristic peaks are well matched with the standard data base values. The UV-Visible transmittance figures are clearly depicting that all the prepared thin films are having transparency of 80%, the optical band gap was estimated to be around 2.56eV to 3.6eV. The scanning electron microscopic (FESEM) analyses show the crack-free and dense nature of the thin film formation. The size of the particle was measured from FESEM images and it was found to be in the range of 40-54nm. In AFM the average crystallite size was estimated 45nm and the root mean square roughness value was found to be 20 nm. EDAX to confirm the presence of dopant elements in the nanostructured thin films.

**Keywords:** Spray Pyrolysis, XRD, morphological and optical properties.

## I. INTRODUCTION

The transparent conducting tin oxide (SnO<sub>2</sub>) thin films have been widely used in many field owing to their, unique properties such as high electrical conductivity and high transmittance in the UV-Visible region [1,2]. Its properties are strongly depend on the deviation of stoichiometry, oxygen deficiency and the nature of the presence of impurity [3,4]. This material has proved itself to be one of the most attractive materials for gas sensor applications due to its special properties such as chemical and thermal stability and non-stoichiometry. Many researchers have been working to tailor the physical properties of SnO<sub>2</sub> thin films by employing different cationic and anionic dopant like Fluorine, Antimony, Zinc, Nickel, Aluminium etc., Depending upon the dopant, the SnO<sub>2</sub> thin films exhibit n-type or p-type conductivity. Aluminium is one of the acceptor impurity which acts as a lower valence cation in SnO<sub>2</sub> and can cause the p – type conductivity. Al doped tin oxide (ATO) nanocrystalline thin films can be prepared by a number of method such as spray pyrolysis [5], sputtering [6], CVD [7], Plasma and sol-gel methods [8-11]. Spray Pyrolysis is suitable for a variety of oxide materials and relatively inexpensive. ATO thin films have been prepared using a spray pyrolysis technique and different amount of Al doped SnO<sub>2</sub> thin films were prepared at T<sub>s</sub>=400°C and annealed at 500°C, 600°C. The effect of Al doping on the structural, optical, morphological and electrical properties of SnO<sub>2</sub> thin films have been studied. The prepared Al doped SnO<sub>2</sub> thin film has been used to many applications for gas sensing device.

Tin Oxide (SnO<sub>2</sub>) is one of the transparent conducting Oxide (TCO) material having wider band gap of 3.6 eV [12] and ionic radius is Sn<sup>4+</sup> r = 0.71 Å [13]. To our knowledge undoped SnO<sub>2</sub> is an n-type semiconductor due to the presence of intrinsic defects like oxygen vacancies. Recent investigations have been focused on increasing n type conductivity of this material [14, 15], while both high quality n-and p type SnO<sub>2</sub> are essential for fabrication of SnO<sub>2</sub> based semiconductor devices. SnO<sub>2</sub> behaves as an n–type semiconductor, However when there is a suitable dopant doped with it, the carrier conversion takes place and change to P type semiconductor [16]. A lower valency cation as acceptor impurity such as Al<sup>3+</sup> (ionic radius r = 0.51 Å) [13] in tin oxide decreases n type conductivity and increases the hole concentration and hence the p – conductivity. However, it is to be noted that in a successful acceptor doping process, besides doping level, effect of annealing and the atomic or cationic size of the acceptor dopant is very



## Influence of zinc sulphate on the corrosion resistance of L80 alloy immersed in sea water in the absence and presence of sodium potassium tartrate and trisodium citrate

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### Abstract

Seawater can be used in cooling water systems. L80 can be used as pipeline carrying sea water. However, this alloy will undergo corrosion. Corrosion can be prevented by addition of inhibitors such as sodium potassium tartrate (SPT), trisodium citrate (TSC), and zinc sulphate. Corrosion resistance of L80 alloy in sea water in the absence and presence of the above inhibitors has been evaluated by polarisation study and AC impedance spectra. It is observed that SPT and TSC show better inhibition efficiency in the presence of  $Zn^{2+}$ . Further it is found that SPT–Zn system is better than the TSC–Zn system. When the SPT or TSC inhibitor is added to sea water, a protective film is formed on the metal surface. This prevents the transfer or release of electrons from the metal surface to the bulk of the solution. Thus corrosion is controlled. This is revealed by the fact that, during polarisation study, the linear polarisation resistance value increases and corrosion current value decreases. During electrochemical impedance study, charge transfer value increases and double layer capacitance value decreases. In the presence of  $Zn^{2+}$ , corrosion resistance of the metal further increases, which is supported by the fact that the linear polarisation resistance value further increases and corrosion current value further decreases. Similarly during electrochemical impedance study, the charge transfer resistance increases tremendously and the double layer capacitance value decreases to a great extent. It is inferred that in the presence of  $Zn^{2+}$ , more inhibitor is transported towards the metal surface as a  $Zn^{2+}$ –inhibitor complex. On the metal surface, an iron inhibitor complex is formed on the anodic sites of the metal surface and  $Zn^{2+}$  is released. The released  $Zn^{2+}$  combines with  $OH^-$  to form  $Zn(OH)_2$  on the cathodic sites of the metal surface. Thus in the presence of  $Zn^{2+}$ , both anodic reaction and cathodic reaction are controlled effectively. This accounts for the increase in corrosion resistance of metal in sea water in the presence of inhibitor and  $Zn^{2+}$ .





## CONTENT BASED IMAGE RETRIEVAL USING MULTI DIMENSIONAL TEXTURE, EDGE ORIENTATION HISTOGRAM AND EDBTC COMPRESSION

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### ABSTRACT

The graph based ranking model is proposed for information retrieval area. Our proposed technique concentrates on ranking the Data Manifold Model or Manifold Ranking (MR). The Content Based Image Retrieval (CBIR) gives an extra-ordinary result underlying geometrical structure for the given image database. MR is an expensive one. This approach limits its usefulness for the large database containing new queries. The name for Graph based Ranking model is Efficient Manifold Ranking (EMR). The scalable<sup>[8]</sup> graph construction and efficient ranking computation are the two views of MR. We specially develop an anchor graph on the database. To increase the speed of ranking adjacency matrix is introduced. EMR is a promising method for real-time retrieval applications.

**Keywords:** Content based image retrieval (CBIR), classification, segmentation.

### 1. INTRODUCTION

Graph based ranking model is mainly focused the problem of out of sample retrieval on large scale databases. Most of the image retrieval systems are based on the keyword search such as Google and Yahoo image search. The keyword is matched based on the image titles, manual annotation, web document etc. The problem occurs are shortage of text information and incomplete statement and image. CBIR<sup>[1] [3]</sup> is the best method to overcome the hurdles. The proposed system sets a trend set for low level features, global features can automatically extracted from images. The researches have been performed for designing more informative low-level features to represent images or better metrics. The performance is restricted due to the sensitive data and conditions. Traditional method concentrates on data features but they ignore the structure information. During the unknown label information at the time they focused the method structure information. The same semantic label is likely to share the



## AUTOMATED SCREENING SYSTEM FOR ACUTE MYELOGENOUS LEUKEMIA DETECTION IN BLOOD MICROSCOPIC IMAGES

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### ABSTRACT

The pervasive among the adults are Acute Myelogenous Leukemia (AML) is a sub-type of acute leukemia. The person has AML mostly at the age of 65 years. The current method implements the manual examination of the blood smear during the diagnosis. It needs for the detection of leukemia<sup>[11]</sup>. It is favor for the operators' ability, accuracy and time consumption. AML is presented a small technique in blood smear. The proposed method includes 1) this approach developed for simplicity 2) classification of complete blood smear images as opposed to sub-images. 3) this algorithm is used to segment and detect nucleated cells. The computer simulation is under the testers comparing the impact of Hausdorff<sup>[7]</sup> dimension on the system before and after the influence of local binary pattern. The sub-images and the whole images performance and the results are compared to the existing system and proposed system. Our aim is to achieve 98% accuracy for the localization of the lympho<sup>[14]</sup> blast cells. Already the microscopic blood images are tested.

**Keywords:** Acute Myelogenous Leukemia (AML), classification, segmentation.

### 1. INTRODUCTION

Our goal is to a) illustrate that the classification of peripheral blood smear images containing multiple nuclei can be fully automated b) the hold-out cross validation method is used to validate and segment the images c) this method estimates around a 50 set of images (25 abnormal samples and 25 normal samples) from American Society of Hematology. The segmentation and classification of AML based on complete microscopic blood images is our proposed method. The term classification<sup>[13]</sup> of leukemia is mostly finding the problem accurately.

In our proposed system, it can extract the shape based approaches like lines, sheets from the 3-D biomedical images. The ellipsoidal model is considered as thin structures. In existing system, Gaussian filter method are implemented to simplify and for getting segmentation results. Using CIELAB color space and various edge detection



## BIOMETRIC DECEIT DETECTION FOR SECURE AUTHENTICATION USING DEEP LEARNING

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**Abstract**— Biometrics systems are playing an important role in personal, national and global security to improve person recognition and authentication. However, the deceiving attacks are occurred, it can be overcome by biometric systems. The people are heedless about biometric deceit sensor to derive outstanding deceit detection systems. They are iris, face, and fingerprint techniques based on the approaches of deep learning<sup>[13]</sup>. The first approach includes of learning each patch in convolutional network architectures and through back propagation the second approach concentrates on learning the weights<sup>[18]</sup> of the network. The nine biometric deceit specifications each one containing real and fake<sup>[20]</sup> samples of a given biometric modality and attack type and learn deep representations for each specification by combining and contrasting the two learning approaches. This plan provides better result from the eight out of nine specifications. The outcomes indicate that deceit<sup>[22]</sup> detection systems based on convolutional networks can be resilient to attacks already known and possibly adapted, with little effort, to image-based attacks.

**Index Terms**— filter weights learning, back-propagation, deceit detection.

### I. INTRODUCTION

BIOMETRICS are used for access control, espionage and also in every security systems by allowing person recognition and authentication based on the features of human. The biometric techniques have been widely applied to person recognition, ranging from traditional fingerprint to face<sup>[19]</sup>, to iris and recently, to vein and blood flow for data acquisition, storage and processing, and also the scientific advances in computer vision, pattern recognition, and machine learning due to technological improvements.

There are various methods to deceit a biometric system. Indeed, previous works show eight different points of attack that can be divided into two main categories: direct and indirect attacks. The possibility to generate synthetic biometric samples is the first exposure of biometric security sensors. The final comprises all the remaining seven attacks and statutory different proportions of knowledge about the system, e.g., the matching algorithm used, the specific feature extraction procedure, database access for manipulation, and also possible weak links in the communication channels within the system.

This is possibly because a number of biometric traits can be easily forged with the use of common equipments and consumer electronics to emulate real biometric readings. Examples are stampers, printers,





## 3-D Face Identification under Disruption Using Masked Projection

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### Abstract:

Face has unique identity among all the human beings. Face identification is used to perform on 2-D and 3-D facial data. 3-D provides higher accuracy than 2-D especially in high security applications. Considering the disruptions covering the facial surface is a great challenge and so enables the fully automatic security systems. In this proposed system handling two problems such as 1) disruption handling for surface registration, and 2) missing data handling for classification based on subspace analysis techniques. The adaptively-selected-model-based registration technique is implemented for alignment problem, where a face model is selected for a cramped face such that only the valid non-cramped patches are utilized. When the registration stage is completed, disruptions are detected and removed. In the classification stage, masked projection is proposed. It enables the use of subspace analysis scheme with incomplete data. The disruption handling is to improve the overall results. The two databases namely, the Bosphorus and the UMB-DB are reported in experimental results. The results confirm that registration based on the adaptively

selected model together with the masked subspace analysis classification offer a disruption robust face identification system.

**Keywords:** Disruption, UMB-DB, Bosphorus, Face Identification.

### 1. INTRODUCTION

Identifying the features of human beings is easily done in biometric systems. The human face is mostly preferred in the biometric identifications. It has the advantage of contactless acquisition<sup>[13]</sup>. It is used in many applications such as public records, authentication, security and safety. In a biometric system, the face identification technique is the most trusted and preferable.

This paper is presented as follows: in Section 2, face identification (2-D and 3-D) is discussed. Section 3 describes the advantages of 3-D face identification systems like disruption, ageing effect, gleam and changes in pose. Section 4 gives a short description about external and internal objects. In section 5, the review of databases and challenges are summarized.



# An Efficient Image De-Noising Gaussian Noise Using Improved Anisodiffusion Filter with DWT in Medical Images

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**ABSTRACT:** Image de-noising continues to be an active research topic. Although state-of-the-art de-noising methods are numerically impressive and approach theoretical limits, they suffer from visible artifacts. However, the images obtained from medical imaging techniques (MRI, Ultrasound, CT etc.) often include imaging noises. Therefore de-noising is an essential and used as a preprocessing process to remove their noises before extracting some meaningful information from these images. In this paper presents an efficient de-noising technique based on Anisodiffusion filter with Discrete Wavelet Transform (DWT) is developed. This proposed method enhances the edges in the de-noised image. The proposed method is tested with MRI, Ultrasound, and CT scan medical images. The performance of this method is compared with the existing standard filters and it has produced good result

**KEYWORDS:** Image de-noise; DWT; Anisodiffusion filter; Gradient;

## I. INTRODUCTION

Medical imaging is one of the technique and process of creating visual representations of the interior of a body for clinical analysis and visual representation of internal structures of human organs [1]. There are many imaging techniques available today, among them Magnetic Resonance Imaging (MRI), Ultrasound, Elastography and Computer Tomography (CT) are most widely used imaging techniques. Magnetic Resonance Imaging (MRI) uses most powerful magnets to polarize and excite hydrogen nuclei of water molecules in human tissue, producing a detectable signal which is spatially encoded, resulting in images of the body. Medical ultrasonography is useful for high frequency broadband sound waves in the megahertz range that are reflected by tissue to varying degrees to produce 2D and 3D images. Ultrasound is used for imaging the abdominal organs, heart, breast, muscles, tendons, arteries and veins.

Elastography is one of the relatively new imaging modality that maps the elastic properties of soft tissue. Elastography is useful in medical diagnoses, as elasticity can discern healthy from unhealthy tissue for specific organs and growth. Computed Tomography (CT) scan, produces 2D image of the structures in a thin section of the body. In CT, a beam of X-rays spins around an object being examined and is picked up by sensitive radiation detectors after having penetrated the object from multiple angles. A computer then analyses the information received from the scanner's detectors and constructs a detailed image of the object. However the images produced by these image sources are sensitive to image noise and thus degrade the quality of the image.

Noise is any degradation of the image signal caused by external disturbance [2]. Usually the medical images, are affected by noises due to the disturbance in the imaging process and inclusion of imaging artifacts. These image noises are classified as Amplifier noise (Gaussian noise), Salt-and-pepper noise (Impulse noise), Shot noise, Quantization noise (uniform noise), Film grain noise, Speckle noise (Multiplicative noise) and Periodic noise. Gaussian is an idealized form of white noise, which is caused by random fluctuations in the signal [3]. In Gaussian noise, each pixel of the image will be changed from its original value by a small amount. There are many standard filters are available in the literature to remove the noises from the medical images. The standard Median Filter (MF) is effective filter but works better only at low noise densities [4], that is, if the noise level is above 50%, edge details of original image cannot be preserved by the standard median filter. Similarly, Adaptive Median Filter (AMF) works well at low noise densities [5], but in high level noise the window size has to be increased which leads to produce blurring effect in the image. Also these filters will not take into account the local features, as an outcome of which the edges may not recovered satisfactorily.





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# A Novel Image Compression on Image Local Patch Extraction Using Run Length Coding

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**ABSTRACT:** Image compression is currently a prominent topic for both military and commercial researchers. Due to rapid growth of digital media and the subsequent need for reduced storage and to transmit the image in an effective manner Image compression is needed. In this paper presents a novel Image Compression On Image Local Patch Extraction Using Run Length Coding incorporates image compression theory, which is the process of extracting the information from the image features from the unsupervised database. The proposed method presents a framework for digital image compression with patch extraction is to discovering best feature from Noisy image database. By aligning the important image features from the database and by using the matching sequence or its encryption of match, the searching between the data features are determined.

**KEYWORDS:** Image Compression; Run length coding; patch extraction; JPEG2000;

## I. INTRODUCTION

Digital image processing is the use of computer algorithms to perform image processing on digital images. The two types of methods used for Digital Image Processing are Analog and Digital Image Processing. Analog or visual techniques of image processing can be used for the hard copies like printouts and photographs. Image analysts use various fundamentals of interpretation while using these visual techniques. The image processing is not just confined to area that has to be studied but on knowledge of analyst. Association is another important tool in image processing through visual techniques. So analysts apply a combination of personal knowledge and collateral data to image processing.

Along with the standardization or independently, many lossless image compression algorithms have been proposed. Among a variety of algorithms, the most widely used ones may be Lossless JPEG [1], JPEG-LS [2], LOCO-I [3], CALIC [4], JPEG2000 [5] (lossless mode) and JPEG XR [6]. The LOCO-I and CALIC were developed in the process of JPEG standardization, where most ideas in LOCO-I are accepted for the JPEG-LS standard although the CALIC provides better compression performance at the cost of more computations.

Image compression is an application of data compression that encodes the original image with few bits. The objective of image compression is to reduce the redundancy of the image and to store or transmit data in an efficient form. The block diagram of the general image storage system. The main goal of such system is to reduce the storage quantity as much as possible, and the decoded image displayed in the monitor can be similar to the original image as much as can be. Lossless compression is bit preserving compression, where the reconstructed image is numerically identical to the original image. This type of compression is important for applications such as medical and satellites imaging, where distortion or loss of information is unacceptable.

The rest of the paper is organized as follows: Related is detailed in Sect. 2. In Sect. 3, Proposed Methodology and the conclusion are in Sect. 5.

## II. RELATED WORK

In [2] authors described the JPEG-2000 is an emerging standard for still image compression. This paper provides a brief history of the JPEG-2000 standardization process, an overview of the standard, and some description of the capabilities provided by the standard. Part I of the JPEG-2000 standard specifies the minimum compliant decoder, while Part II describes optional, value-added extensions. Although the standard specifies only the decoder and bit-stream syntax, in this paper we describe JPEG-2000 from the point of view of encoding. In [3] authors described the standardization committee has been the development of Part I, which could be used on a royalty- and fee-free basis.





# An Optimal Image Fusion Using Local Variation and Gradient Reversal Suppression

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**ABSTRACT:** The goal of image fusion (IF) is to integrate complementary multi-sensor, multi-temporal and/or multi-view information into one new image containing information the quality of which cannot be achieved otherwise. In this paper presents an optimal Image fusion scheme is novel for capturing a scene by using a standard dynamic range device and synthesizing an image suitable for SDR (Standard Dynamic Range) displays. The captured image series, first calculate the image global luminance levels, which maximize the observable contrasts, and then the scene gradients embedded in these images. The fusion algorithm techniques of diffusion and contrast are implemented. This is done in a multi-resolution of brightness variation in the sequence.

**KEYWORDS:** Image Fusion; gradient; SDR; Luminance;

## I. INTRODUCTION

Image fusion is the process of combining information from two or more images of the same scene so that the resulting image will be more suitable for human and machine perception or further image processing tasks such as segmentation, feature extraction, and target recognition [1]–[4]. It is widely applied into many fields such as computer vision, medical imaging, and remote sensing. For example, in the computer vision field, the technique can be used for overcoming the limited depth-of-focus of optical lenses in charge-coupled devices.

Image fusion methods can be broadly classified into two categories, namely, spatial domain and transform domain. The former, including averaging and principal component analysis (PCA) [2], can directly fuse the source images into the intensity values, whereas the latter, which include the Laplacian pyramid (LAP)-based method [1], discrete wavelet transform (DWT)-based approach [3], and discrete cosine transform (DCT)-based algorithm [4], merge the transform coefficients using the classical weighted average strategy or the choose-max strategy and then obtain the fused result through the inverse transformation of the combined coefficients.

Digital Imaging System has been used in various image processing domains such as satellite and commercial domain like Voter ID. The proposed system uses JPEG images and it supports two-dimensional (2-D) images. The quality of the image is measured using Peak-Signal- Noise Ratio (PSNR) which is measured by decibel (dB). It mainly concentrates on Depth of Field (DOF) of an image. In the proposed work the input images are in the form of sequence of four images which is taken at various situations such as with flash, without flash, with light and without light. Depth of Field is nothing but the distance between the nearest and farthest objects in a scene which appears acceptably sharp in an image. The various steps are carried out and thus the result obtained is a fusion of the images which is clear and the quality of image is good. It shows best result when compared with the existing system.

The fusion algorithm techniques are used for fusion of images based on contrast and gradient level. This is done in a multi-resolution of brightness variation in the sequence. Gaussian filter method and Laplacian methods are used so that up-scaling and down-scaling is done successfully.

The rest of the paper is organized as follows: Related is detailed in Sect. 2. In Sect. 3, Proposed Methodology and the conclusion are in Sect. 5.

## II. RELATED WORK

In [2] authors discussed to increase the spatial resolution, a SPOT panchromatic image was combined with the extracted spectral image; merging methods, classic IHS transforms and linear combinations were tested. For these two

## IMAGE ENCRYPTION USING BINARY BIT PLANE AND ROTATION METHOD FOR AN IMAGE SECURITY

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### Abstract

Image encryption plays a major role in information security. It is mainly used to convert the original image into another form. In this work, we propose a bit plane slicing of digital image to provide the more security. To enhance security of the bitplane decomposition based image encryption methods, this paper introduces a novel image encryption algorithm using a bitplane of a source image as the security key bitplane to encrypt images. It focuses on three techniques such as image scrambling, bit plane slicing and image rotation for efficient image encryption. Arnold scrambling and bit plane slicing process are performed in the source image. From the decomposed source image, particular bitplane is assigned as the security key bit plane to perform the encryption process in the original image. As an example, this paper also proposes a bit-level scrambling algorithm to change bit positions. Simulations and security analysis are provided to demonstrate an excellent encryption performance of the proposed algorithm.

*Index Terms – Image Encryption, Bit Plane Slicing, Rotation, Scrambling.*

### 1. INTRODUCTION

Cryptography is an efficient method of transferring information in a secure way. It scrambles the image before transmitting in order to change the structure of an image. Even the attacker cannot able to hack because it is difficult for him to retrieve the original image. It only provides the modified form of an image but it does not hide the image even though it is better secure method. The main intention is to provide better protection of the original image. Bit plane slicing is mainly used for splitting images into binary planes. Each bit is used to represent the intensity of each pixel of an image. Image scrambling is always based on pixel values of an image. The digital image is divided into 8 bit planes because it is useful for analyzing the importance of each bit in an image. Whereas a small change in color affect bit value of an image. The color image is composed of many pixels is decomposed into 8 bit planes. It is used to represent the highest order and lower order bits to specify the contribution of each bit in an image. It achieves better image encryption than the other least significant bit,

perceptual masking technique. This process is done on without changing the overall image quality.

Image Encryption is the process of encoding messages in such a way that eavesdroppers or hackers cannot read it, however that authorized parties. With the huge growth of computer networks and the latest advances in digital technologies, a huge amount of digital data is being exchanged over various types of networks. It is often true that a large part of this information is either confidential or private. As a result, different security techniques have been used to provide the required protection. The security of digital images has attracted more attention recently, and many different image encryption methods have been proposed to enhance the security of these images. Image encryption techniques try to convert an image to another one that is hard to understand. On the other hand, image decryption retrieves the original image from the encrypted one. There are various image encryption systems to encrypt and decrypt data, and there is no single encryption algorithm satisfies the different image types. They protect the secret information by



# Computation Of Burnt Forest Region Using Digital Image Processing

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**Abstract:** Predicting the forest fire is an important problem from many points of view. It destroys ecology and decreases the overall life quality. It is important from economical point of view as wood is a valuable resource. Fires not only affect the characteristics of forests but it also affects human lives and livelihood. Due to the lack of collecting the aerial view images of forest fire and also lack of specific techniques for calculation of burnt regions of forests, researchers use different methods. In this paper, we examine the problem of collecting the exact aerial image forest fire detection of different parts of the forest areas. Our approach is based on image pre-processing, segmentation of images are produced using the segmentation methods and compute the burned area. The images are collected from the videos. In the preprocessing phase, forest fire video is converted into frames and stored as images.

**Keyword :** Thresholding, noise removal, burned region, image scaling

## 1. INTRODUCTION

Forest fire is one of the most threatening commotions for property, infrastructure and ecosystem. The long vapid and hot summer is responsible for rapid increase in fires with uncontrolled strong wind, results in forest fire and large burnt areas every year. Generally, the wild land fire is initiate through lightening but human negligence is also responsible to burn thousands of square kilo meters. The other important parameter responsible for the burn occur in forest is drying out branches and leaves and become highly flammable. Increment in forest fires not only degrades the modem of forest but also it degrades the human lives and lively hoods. In relation to loss of human lives examples, the forest fires in Victoria, Australia in 2009, which caused 173 fatalities, while fires in Greece in 2007, resulted in 80 dead. Many wilderness urban interface fires have clearly shown how wildfires affect and threaten residential area.

According to precursor, fires acquired in forest will halve the world forest stand before the year 2030. 20% of complete CO2 emission came from forest fires indicates that it is important to deal these phenomenon with great attention. Also the increment in the rate of occurrence of fire is occurred due to the global warming.

Fires affect not only forests and their function and services, but also the other assets that is human lives and livelihoods. The damage can be extend to landscape and results in haze and deposit pollutants as well as the release of greenhouse gases. Presently there is no conventional method to evaluate accurate area of burnt regions of forests and hence researches uses different methods and variables .The main parameter during consideration of computation of burnt regions is speed in performing processes and in damage evaluation. In this report, An aerial digital image which is obtained from forest after the fire occurrence is used to calculate the primary area of burnt regions using digital image processing and to obtain the accurate real area in hectares , coefficient "m" is calculated. This method is dependent on some secondary parameters such as aerial camera and helicopter in order to calculate real area of burnt regions. To obtain accurate and rapid evaluation of burnt regions after the wild land fire suppression is used for the reforestation and restoration in the affected areas and to avoid the post wild fire hazards and degradation of affected areas.

## 2. LITERATURE SURVEY

Bibek Ranjan Ghosh, Siddhartha Banerjee, Attyuttam Saha, Fire is one of the major problems that are causing great loss to property and ecosystem in today's world. Fires not only affect the characteristics of forests but it also affects human lives and livelihood. Due to the lack of specific techniques for calculation of burnt regions of forests, researchers use different methods. In this research, an automated approach is developed to determine the significant burnt area of forest using different image processing techniques. The proposed method is compared with other existing methods and is found to be capable in more precise measurement of the burnt area. The proposed method produces much more exact results at a single trial and uses no brute force method to determine a proper filter to determine the exact region affected by the wild fire.

Hamidreza, Hamud and Asadollah proposed a method which uses a hit and trial method using median filters. This method is basically a brute force method to search for a proper median filter that serves the purpose of detecting the actual burnt region. After binarizing the image using the thresholding technique, median filters are being applied. Firstly a median filter of 3x3 dimensions have been used followed with filters of 5x5,7x7 dimensions and finally a proper result is obtained using a filter of 9x9 dimensions.

Dr.M.P Sivaram Kumar, Shyamala.R, Priyanka.G, Sneha.R, propose a method for the detection of fire through the usage of photographed data of forest area followed by computer processing of the data. A method for reading information, pre-processing of an image color components, the segmentation and data classification using SVM is proposed. The method is



## Image Resolution Enhancement using Bicubic and Spline Interpolation Techniques

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### Abstract:

Images are being used in many fields of research. One of the major issues of images is their resolution. In this paper we are studying different image resolution enhancement techniques that use Wavelet Transform (WT). Basis functions of the WT are small waves located in different times. They are obtained using scaling and translation of a scaling function and wavelet function. Therefore, the WT is localized in both time and frequency. In this method is used to improve the image resolution for different type of images. In this paper we are comparing different image resolution enhancement techniques those using Wavelet Transform.

In this correspondence, the authors propose an image resolution enhancement technique based on interpolation of the high frequency subband images obtained by discrete wavelet transform (DWT) and the input image. The edges are enhanced by introducing an intermediate stage by using stationary wavelet transform (SWT). DWT is applied in order to decompose an input image into different subbands. Then the high frequency subbands as well as the input image are interpolated. The estimated high frequency subbands are being modified by using high frequency subband obtained through SWT. Then all these subbands are combined to generate a new high resolution image by using inverse DWT (IDWT). The quantitative and visual results are showing the superiority of the proposed technique over the conventional and state-of-art image resolution enhancement techniques.

**Keywords— Image Interpolation, Peak signal-to-noise ratio (PSNR), Discrete Wavelet Transform (DWT), Stationary Wavelet Transform (SWT).**

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### I. INTRODUCTION

Image resolution enhancement is a usable preprocess for many satellite image processing applications, such as vehicle recognition, bridge recognition, and building recognition to name a few. Image resolution enhancement techniques can be categorized into two major classes according to the domain they are applied in: 1) image-domain; and 2) transform-domain. The techniques in image-domain use the statistical and geometric data directly extracted from the input image itself [1], [2], while transform-domain techniques use

transformations such as decimated discrete wavelet transform to achieve the image resolution enhancement [3]–[6].

The decimated discrete wavelet transform (DWT) has been widely used for performing image resolution enhancement [3]–[5]. A common assumption of DWT-based image resolution enhancement is that the low-resolution (LR) image is the low-pass filtered subband of the wavelet-transformed high-resolution (HR) image. This type of approach requires the estimation of wavelet

## Green synthesis and characterization of silver nanoparticles from *Manilkara zapota* leaf extract

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### Abstract

The aim of the present work is to investigate the green synthesis of silver nanoparticles from *Manilkara zapota* leaves extract. The absorption of MZAg UV-Vis spectroscopy. The functional groups are analysed by Fourier transform infrared spectroscopy. The ability of new compounds to act as hydrogen donors or free radical scavengers was tested by conducting a series of *in vitro* antioxidant assays. The MZAg was characterized surface morphology by scanning electron microscopy, Elemental constitution by Energy dispersive X-Ray diffraction. X-Ray diffraction studies were used to analyse the surface of the nature of the green synthesis of silver nano particles of MZAg.

### 1. Introduction

The Nanoworld deals with tiny objects which are nanometric in size at least in one dimension. The science of nanomaterials deals with their generation and properties and the phenomena exhibited by them because of their small size [1]. Nano-objects can be spherical, wiry, and tubular (or) sheet like. Nanotechnology is the study of matter on an atomic and molecular scale. One billionth (or)  $10^{-9}$ m. The carbon-carbon bond length is in the range of 0.12-0.15 nm and the DNA double helix has a diameter of 2nm and bacteria will be around 200nm. So partials of nanometer size are called nanopartical [2]. Nanomaterials have been the subject of enormous interest. More importantly, Ag NPs are highly antimicrobial due to their antiseptic properties against several species of bacteria, including the common kitchen microbe. As such, Ag NPs have caught the attention of many researchers, especially because of their activity (3).



## Inhibitive action of Pippali Dye-Zn<sup>2+</sup> system of carbon steel in Sea water

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### Abstract

The inhibition efficiency (IE) of Pippali Dye- (PD) Zn<sup>2+</sup> system in controlling corrosion of carbon steel has been evaluated by weight loss method. Weight loss study reveals that the formulation consisting of 10 mL of PD and 25 ppm of Zn<sup>2+</sup> has 92% inhibition efficiency in controlling corrosion of carbon steel immersed in sea water. Polarization study reveals that this system functions as mixed type inhibitor. AC impedance spectra reveal that a protective film is formed on the metal surface. The FTIR spectra reveal that the protective film consists of Fe<sup>2+</sup>-PD complex. This is further confirmed by UV-visible spectra and fluorescence spectra.

**Key words:** Corrosion, Sea water, Carbon Steel, Inhibitors, Pippali Dye.

### 1. Introduction

Corrosivity of metals used as construction materials are of important consideration for marine constructions planning. Corrosion at marine areas occurs as a consequence of metals in contact with seawater blown by the wind that will cling to the metal surfaces. Fine sprinkling of seawater containing chloride is very corrosive to the metals. The corrosion is more rapid if the metals are dipped in sea-water. Metals such as copper and iron, which are important for modern man's life tend to corrode. Corrosion of the metals as a result of fine sprinkling of seawater cause permanent reduction in the metal quality, which is not only materially disadvantageous, but could also create conditions which might cause disasters and loss economically. Plants are sources of naturally occurring compounds, some with complex molecular structures and having



# SD Closed set, SD Open set and its Properties

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**ABSTRACT:** In this paper, we introduce and investigate the notation of SD closed set and SD open sets by utilizing generalized closed sets and regular b-closed set. We obtain fundamental properties of SD closed set and SD closed set and discuss the relationships between SD closed set and SD open set and other related sets.

**KEY WORDS:** SD closed set, SD open set.

## I. INTRODUCTION

The notion of regular b-closed (briefly rb-closed) sets is introduced and studied recently by Nagaveni and Narmadha [1],[2]. Regular open sets and b-open sets have been introduced and investigated by Stone [3] and Andrijević [4], respectively. Levine [5] (resp. Bhattacharya and Lahiri [6], Palaniappan and Rao [7], Arya and Nour [8], Maki et al [9], Maki et al [10],[11]) introduced and investigated generalized closed sets (resp. semi-generalized closed sets, regular generalized closed sets, generalized semi-closed sets, generalized preclosed sets, generalized  $\alpha$ -closed sets and  $\alpha$ -generalized closed sets). Al-Omari and Noorani [12] investigated the class of generalized b-closed sets and obtained some of its fundamental properties. We introduce and study the concepts of rb-open sets and rb-closed spaces. Throughout this paper, a space means a topological space on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a space  $(X, \tau)$ ,  $Cl(A)$  and  $Int(A)$  denote the closure of A and interior of A, respectively.  $X - A$  or  $A^c$  denotes the complement of A in  $X$ . The concept of generalized closed sets plays a significant role in topology. There are many research papers which deal with different types of generalized closed sets. Bhattacharya and Lahiri [6] introduced sg-closed sets in topological spaces. Arya and Nour [8] introduced gs-closed sets in topological spaces. Sheik John [14] introduced w-closed sets in topological spaces. Ravi and Ganesan [15] introduced  $\tilde{g}$ -closed sets in topological spaces. Quite Recently, Ravi et. al. [16] have introduced  $\approx$ g-closed sets in topological spaces. In this paper we introduce a new class of sets namely sd-closed sets in topological spaces and study their basic properties.

## II. PRELIMINARIES

**Definition: 2.1** A subset A of a space  $(X, \tau)$  is called

- (i) Semi-open set [18] if  $A \subseteq Cl(Int(A))$
- (ii) preopen set [19] if  $A \subseteq Int(Cl(A))$
- (iii)  $\alpha$ -open set [20] if  $A \subseteq Int(Cl(Int(A)))$
- (iv) semi-preopen set [21] if  $A \subseteq Cl(Int(Cl(A)))$

# $\delta$ mk-Closed Set and $\delta$ mk-Open Set in Topological Spaces

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**ABSTRACT:** In this paper, we introduce and investigate the notation of  $\delta$ mk-closed set and  $\delta$ mk-open set. We obtain fundamental properties of  $\delta$ mk-closed set,  $\delta$ mk-open set and discuss the relation between  $\delta$ mk-closed set,  $\delta$ mk-open set and other related sets.

**KEYWORDS:**  $\delta$ mk-closed set,  $\delta$ mk-open set.

## I. INTRODUCTION

The concept of generalized closed sets introduced by Levine [1] plays a significant role in general topology. After the introduction of generalized closed sets many research papers were published which deal with different types of generalized closed sets. Y. Gnanambal [2] introduced the concept of gpr-closed set and investigated its basic properties. H. Maki et al. [3] defined the concept of gp-closed set in topological spaces and established results related to it. These concepts motivated us to define a new class of sets called the delta generalized pre-closed sets. Throughout this paper,  $(X, \tau)$  (or simply  $X$ ) represents topological space on which no separation axioms are assumed unless explicitly stated. For a subset  $A$  of a space  $(X, \tau)$ , we denote the closure of  $A$ , the interior of  $A$  and complement of  $A$  as  $Cl(A)$ ,  $int(A)$  and  $A^c$  respectively. The modified forms of generalized closed sets and  $\hat{g}$ -closed sets were studied by K. Balachandran, P. Sundaram and H. Maki [4]. In 2008, S. Jafari, T. Noiri, N. Rajesh and M.L. Thivagar [5] introduced the concept of  $\hat{g}$ -closed sets and their properties. In this paper, we introduce new classes of sets called  $\hat{g}$ -closed sets for topological spaces.

## II. PRELIMINARIES

- 2.1. A subset  $A$  of a topological space  $X$  is called, pre-open [6] if  $A \subseteq int(Cl(A))$  and Pre-closed if  $Cl(int(A)) \subseteq A$ .
- 2.2. A subset  $A$  of a topological space  $X$  is called,  $\alpha$ -open [7] if  $A \subseteq int(Cl(int(A)))$  and  $\alpha$ -closed if  $Cl(int(Cl(A))) \subseteq A$ .
- 2.3. A subset  $A$  of a topological space  $X$  is called,  $b$ -open [8] if  $A \subseteq Cl(int(A)) \cup int(Cl(A))$  and  $b$ -closed if  $Cl(int(A)) \cap int(Cl(A)) \subseteq A$ .
- 2.4. A subset  $A$  of a topological space  $X$  is called, regular-open [9] if  $A = Cl(int(A))$  and regular-closed if  $A = Cl(int(A))$ .
- 2.5. A subset  $A$  of a topological space  $X$  is called, semi-open [10] if  $A \subseteq Cl(int(A))$  and semi-closed if  $int(Cl(A)) \subseteq A$ .

# SK Open set and SK Closed set in Topological Spaces

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**ABSTRACT:** In this paper, we introduce and investigate the notation of SK open set and SK closed set. We obtain fundamental properties of SK open set and SK closed set and discuss the relation between SK open set and SK closed set and other related sets.

**KEYWORDS:** SK open set, SK closed set.

## I. INTRODUCTION

Levine [1] introduced generalized closed sets in topology as a generalization of closed sets. This concept was found to be useful and many results in general topology were improved. Many researchers like Arya et al [2], Balachandran et al [3], Bhattacharya et al [4], Arockiarani et al [5], Gnanambal [6] Malghan [7], Nagaveni [8] and Palaniappan et al [9] have worked on generalized closed sets. In this paper, the notion of sg-interior is defined and some of its basic properties are investigated. Also we introduce the idea of sg-closure in topological spaces using the notions of sg-closed sets and obtain some related results. Throughout the paper,  $X$  and  $Y$  denote the topological spaces  $(X, \tau)$  and  $(X, \sigma)$  respectively and on which no separation axioms are assumed unless otherwise explicitly stated. In 1937, regular open sets were introduced and used to define the semi-regularization space of a topological space. Throughout this paper,  $(X, \tau)$  and  $(Y, \sigma)$  stand for topological spaces with no separation axioms assumed unless otherwise stated. For a subset  $A$  of  $X$ , the closure of  $A$  and the interior of  $A$  will be denoted by  $cl(A)$  and  $int(A)$ , respectively. Stone [10] defined a subset  $A$  of a space  $X$  to be a regular open if  $A = int(cl(A))$ . Norman Levine [11] defined a subset  $A$  of a space  $X$  to be a semi-open if  $A \subset cl(int(A))$ , or equivalently, a set  $A$  of a space  $X$  will be termed semi-open if and only if there exists an open set  $U$  such that  $U \subset A \subset cl(U)$ . Mashhour *et al.* [12] defined a subset  $A$  of a space  $X$  to be a preopen if  $A \subset int(cl(A))$ . Njastad [13] defined a subset  $A$  of a space  $X$  to be an  $\alpha$ -open if  $A \subset int(cl(int(A)))$ . The complement of a semi-open (resp., regular open) set is said to be semi-closed [14] (resp., regular closed). The intersection of all semi-closed sets of  $X$  containing  $A$  is called the semi-closure [15] of  $A$ . The union of semi-open sets of  $X$  contained in  $A$  is called the semi-interior of  $A$ . Joseph and Kwack [16] introduced the concept of  $\theta$ -semi open sets using semi-open sets to improve the notion of S-closed spaces. Also Joseph and Kwack [16] introduced that a subset  $A$  of a space  $X$  is called  $\theta$ -semi-open if for each  $x \in A$ , there exists a semi-open set  $G$  such that  $x \in G \subset cl(G \cap A)$ . It is well-known that, a space  $X$  is called  $TI$  if to each pair of distinct points  $x, y$  of  $X$ , there exists a pair of open sets, one containing  $x$  but not  $y$  and the other containing  $y$  but not  $x$ , as well as is  $TI$  if and only if for any point  $x \in X$ , the singleton set  $\{x\}$  is closed. A space  $X$  is regular if for each  $x \in X$  and each open set  $G$  containing  $x$ , there exists an open set  $H$  such that  $x \in H \subset cl(H) \subset G$ .  $N.K.$  Ahmed [17] defined a topological space  $(X, \tau)$  to be  $s^{**}$ -normal if and only if for every semi-closed set  $F$  and every semi-open set  $G$  containing  $F$ , there exists an open set  $H$  such that  $F \subset H \subset cl(H) \subset G$ . In 1968, Velicko [18], defined the concepts of  $\delta$ -open and  $\theta$ -open as, a subset  $A$  of a space



## Strong 2 – Domination in Fuzzy Graph

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**ABSTRACT:** In this paper we introduce the concepts of strong 2 – domination of a fuzzy graph. We determine the strong 2 – domination number  $\gamma_{2,S}$  of the fuzzy graph  $G$  is the minimum cardinality taken over all Strong 2 – dominating number of a fuzzy graph and that of its complement are discussed. We also prove some results on strong 2- dominating set.

**KEYWORDS:** fuzzy graph, complement, Strong domination, 2 – domination, strong 2 – domination set, strong 2 – domination number.

### I. INTRODUCTION

The study of fuzzy graph and several fuzzy graph analogs of graph theoretic concepts such as paths, cycle and connectedness were started by Rosenfeld [8] (1975). Ore and Berge [1,7] introduced the dominating sets in graphs. Fink introduced the n-domination in graphs. A.Somasundaram and S.Somasundaram [9,10] discussed domination in fuzzy graphs using effective edges in fuzzy graphs. Nagoor Gani and Chandrasekaran discussed domination in fuzzy graphs. They defined the domination using strong arcs [3]. Nagoor Gani and prasanna discussed the concept of a edge domination and edge independence in fuzzy graphs [4,6]. The concept of strong arcs introduced by Bhutini and Rosenfeld [2]. A study of dominating sets in graphs started purely as a problem in the game of chess, it was during 1850s.

### II. PRELIMINARIES

Let us see the following basic definitions in a fuzzy graph and domination in fuzzy graph. Let introduce some new notations

**Definition 2.1:** Let  $E$  is a collection of all two- element subsets of  $V$ . A fuzzy graph  $G = \langle \sigma, \mu \rangle$  is a set with two function  $\sigma: V \rightarrow [0,1]$  and  $\mu: E \rightarrow [0,1]$  such that  $\mu(x, y) \leq \sigma(x) \wedge \sigma(y)$  for all  $x, y \in V$ . hereafter we write  $\mu(x, y)$  or  $\mu(xy)$ .

**Definition 2.2:** A fuzzy graph  $H = \langle \tau, \rho \rangle$  is called a fuzzy subgraph of  $G$  if  $\tau(v_i) \leq \sigma(v_i)$  for all  $v_i \in V$  and  $\rho(v_i, v_j) \leq \mu(v_i, v_j)$  for all  $v_i, v_j \in V$ .

**Definition 2.3:** The order  $p$  and size  $q$  of a fuzzy graph  $G = \langle \sigma, \mu \rangle$  are defined to be  $p = \sum_{x \in V} \sigma(x)$  and  $q = \sum_{x,y \in E} \mu(xy)$ .

**Definition 2.4:** The Underlying Crisp Graph of a fuzzy graph  $G = (\sigma, \mu)$  is denoted by  $G^* = (\sigma^*, \mu^*)$ , where  $\sigma^* = \{u \in V / \sigma(u) > 0\}$  and  $\mu^* = \{(u, v) \in V \times V / \mu(u, v) > 0\}$ .

**Definition 2.5:** A fuzzy graph  $G$  is said to be a Strong Fuzzy Graph if  $\mu(x, y) = \sigma(x) \wedge \sigma(y) \forall (x, y)$  in  $\mu^*$  and if Complete Fuzzy Graph if  $\mu(x, y) = \sigma(x) \wedge \sigma(y) \forall (x, y)$  in  $\sigma^*$ .

# Excellent Domination in Square Fuzzy Graphs

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**ABSTRACT:** In this chapter we introduce the concept of excellent domination in square fuzzy graph and also we discuss about some related theorems and examples of excellent domination in square fuzzy graph.

**KEYWORDS:** Fuzzy domination, square fuzzy graph, excellent fuzzy graph, strong fuzzy graph, complete fuzzy graph, excellent square fuzzy graph.

## I. INTRODUCTION

Fuzzy graph theory was introduced by Azriel Rosenfeld in 1975. The study of dominating sets in graph was begun by Orge and Berge. A.somasundaram, S.somasundaram [12] presented the concepts of Domination in fuzzy graph. An Excellent domination in fuzzy graph was presented by K.M Dharmalingam and P. Nithya [2]. Some results in square fuzzy graph were presented by G.Sanjeevi [7]. Here we introduce the concept of excellent domination in square fuzzy graph and their related concepts.

## II. PRELIMINARIES

**Definition 2.1:** A *fuzzy graph*  $G = (\sigma, \mu)$  is a pair of functions  $\sigma: V \rightarrow [0,1]$  and  $\mu: V \times V \rightarrow [0,1]$  Where for all  $u, v \in V$ , we have  $(u, v) \leq \sigma(u), \sigma(v)$ .

**Definition 2.2:** The *underlying crisp graph* of  $G: (\sigma, \mu)$  is denoted by  $G^*(V, E)$  Where  $E \subseteq V \times V$ .

**Definition 2.3:** A subset  $D$  of  $V$  is called a *fuzzy dominating set* if for every  $v \in V - D$  there exists a vertex  $u \in D$  such that  $uv \in E(G)$  such that  $\mu(uv) \leq \sigma(u) \wedge \sigma(v)$ . The minimum cardinality of such a dominating set is denoted by  $\gamma^f$  and is called the *fuzzy domination number* of  $G$ .

**Definition 2.4:** A fuzzy graph  $G$  is said to be *fuzzy excellent* if for every vertex of  $G$  belongs to  $\gamma^f$  - sets of  $G$ . A vertex which belongs to  $\gamma^f$  - set is called *Fuzzy good*. (i.e) A Fuzzy graph  $G$  is said to be Fuzzy excellent if for every vertex of  $G$  is Fuzzy good.

**Definition 2.5:** A fuzzy graph  $G: (\sigma, \mu)$  is a *strong fuzzy graph* if  $\mu(u, v) = \sigma(u) \wedge \sigma(v)$  for all  $(u, v) \in E$  and is a *complete fuzzy graph* if  $\mu(u, v) = \sigma(u) \wedge \sigma(v)$  for all  $(u, v) \in V$

**Definition 2.6:** A fuzzy graph  $G: (\sigma, \mu)$  is said to be *regular fuzzy graph* if all the vertices have same degree.

**Definition 2.7:** Let  $G: (\sigma, \mu)$  be a fuzzy graph with underlying crisp graph  $G^*(V, E)$ . Then the *Square fuzzy graph* of  $G$  is denoted by  $G^2(\sigma^2, \mu^2)$  and is defined as

$$\sigma^2(\mu) = \sigma(\mu), \forall u \in V \text{ and } \mu^2(u, v) = \begin{cases} \mu(u, v), & \text{if } (u, v) \in E \\ \sigma(u) \wedge \sigma(v), & \text{if } (u, v) \notin E \end{cases}$$

If  $u$  and  $v$  are joined by a path of length is less than or equal to two in  $G^*(V, E)$ .



# Connected Edge Perfect Domination in Fuzzy Graphs

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**ABSTRACT:** In this paper we introduce the concept of connected edge perfect domination and connected edge domination in fuzzy graph. We determine the connected edge perfect domination number for standard theorems and some examples. Finally the connected edge perfect domination set and number for a connected fuzzy graph is obtained.

**KEYWORDS:** Fuzzy graph, Dominating set, Edge domination, Edge domination number, Effective edge, Connected edge domination, Perfect dominating set, Connected edge perfect domination, Connected edge perfect domination number.

## I. INTRODUCTION

An interesting application in voting situation using the concept of domination. The study of dominating sets in graphs was begun by Ore and Berge, the domination number, independent domination number are introduced by Cockayne and Hedetniemi. A. Somasundram and S. Somasundram discussed domination in fuzzy graphs. V.R. Kulli and D.K. Patwari discussed the total edge domination number of graph. Nagoor Gani and Chandrasekaran discussed domination in fuzzy graph using strong arcs. We also discuss domination, independent domination and perfect domination in fuzzy graph using strong arcs. In this paper we introduce the connected edge perfect domination in fuzzy graph, the connected edge perfect domination number, and give some important results.

## II. PRELIMINARIES

**Definition 2.1:** A *fuzzy graph*  $G = (\sigma, \mu)$  is a set with two functions,  $\sigma: V \rightarrow [0,1]$  and  $\mu: E \rightarrow [0,1]$  such that  $\mu(xy) \leq \sigma(x) \wedge \sigma(y) \forall x, y \in V$ . Let  $\sigma: V \rightarrow [0,1]$  be a fuzzy subset of  $V$  then the *complete fuzzy graph* on  $\sigma$  is defined on  $G = (\sigma, \mu)$  where  $\mu(xy) = \sigma(x) \wedge \sigma(y)$  for all  $xy \in E$  and is denoted by  $K_\sigma$ . The *complement of a fuzzy graph*  $G$  denoted by  $\tilde{G} = (\sigma, \bar{\mu})$  where  $\bar{\mu}(xy) = \sigma(x) \wedge \sigma(y) - \mu(xy)$ .

**Definition 2.2:** Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $V$ . Let  $x, y \in V$ . We say that  $x$  dominated  $y$  in  $G$  if  $\mu(xy) = \sigma(x) \wedge \sigma(y)$ . A subset  $S$  of  $V$  is called a *dominating set* in  $G$  if for every  $v \notin S$ , there exists  $u \in S$  such that  $u$  dominates  $v$ . The minimum fuzzy cardinality of a dominating set in  $G$  is called the *domination number* of  $G$  and is denoted by  $\gamma(G)$  or  $\gamma$ .

**Definition 2.3:** Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $V$  and  $S \subseteq V$ . Then the *fuzzy cardinality* of  $S$  is defined to be  $\sum_{v \in S} \sigma(v)$ . Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $V$  and  $D \subseteq E$ . Then the *fuzzy edge cardinality* of  $D$  is defined to be  $\sum_{e \in D} \mu(e)$ .

**Definition 2.4:** Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $(V, X)$ . A subset  $S$  of  $X$  is said to be an *edge domination set* in  $G$  if for every  $x \in X - S$  is adjacent to atleast one effective edge in  $S$ . The minimum fuzzy cardinality of an edge dominating



# Fuzzy Multiple Split Domination Number

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**ABSTRACT:** In this paper we introduced the concepts of fuzzy multiple split domination number. We determine the number  $\gamma_{ms}(G)$  of a fuzzy multiple split domination number and obtain the definitions and theorems.

**KEYWORD:** Graph, Fuzzy Graph, Domination set, Multiple domination set, Split dominating set, Split domination number.

## I. INTRODUCTION

The study of dominating sets in graphs was begun by Ore and Berge, the domination number is introduced by Cockayne and Hedetniemi, Rosenfeld introduced the notion of fuzzy graph and several fuzzy analogs of graph theoretic concepts such as paths, cycle and connectedness. A. Somasundaram and S. Somasundaram discussed domination in fuzzy graph. A. Nagoor Gani and V. T. Chandrasekaran discussed domination in fuzzy graph. We also discussed the domination number of the fuzzy digraph, fuzzy  $k$ -dominating set, fuzzy  $k$ -domination number, fuzzy multiple domination. Then the concept of split domination was introduced by V. R. Kulli and B. Janakiram discussed about the split domination number by using this finally about the fuzzy multiple split domination number  $\gamma_{ms}(G)$ .

## II. PRELIMINARIES

**Definition 2.1:** A fuzzy graph  $G = (\sigma, \mu)$  is a set with two functions  $\sigma: V \rightarrow [0,1]$  and  $\mu: E \rightarrow [0,1]$  such that  $\mu(\{x, y\}) \leq \sigma(x) \wedge \sigma(y)$  for all  $x, y \in V$ . Then we write  $\mu(xy)$  for  $\mu(\{x, y\})$ .

**Definition 2.2:** Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $V$  and  $V_1 \subseteq V$ . Define  $\sigma_1$  on  $V_1$  by  $\sigma_1(x) = \sigma(x)$  for all  $x \in V_1$  and  $\mu_1$  on the collection  $E_1$  of two element subsets of  $V_1$  by  $\mu_1(x, y) = \mu(xy)$  for all  $x, y \in V_1$ . Then  $(\sigma_1, \mu_1)$  is called the fuzzy sub graph of  $G$  induced by  $V_1$  and is denoted by  $\langle V_1 \rangle$ .

**Definition 2.3:** Let  $G = (\sigma, \mu)$  be a fuzzy graph on  $V$  and  $S \subseteq V$ . Then the fuzzy cardinality of  $S$  is defined to be  $\sum_{v \in S} \sigma(v)$ .

**Definition 2.4:** A subset  $D$  of  $V$  is said to be a **dominating set** of  $G$  if every vertex in  $V - D$  is adjacent to a vertex in  $D$ .

**Definition 2.5:** The **domination number**  $\gamma(G)$  of  $G$  is the minimum cardinality of a dominating set.

**Definition 2.6:** Let  $G = (V, \sigma, \mu)$  be a fuzzy graph. Then  $D \subseteq V$  is said to be a **fuzzy dominating set** of  $G$  if for every  $v \in V - D$  there exists  $u$  in  $D$  such that  $\mu(v, u) = \sigma(u) \wedge \sigma(v)$ .

**Definition 2.7:** The minimum fuzzy cardinality of a fuzzy dominating set is called the **fuzzy domination number** of  $G$  and is denoted by  $\gamma_f(G)$ .

**Definition 2.8:** A fuzzy dominating set  $D$  of a fuzzy graph  $G$  is called a **multiple dominating set** of  $G$  if for each vertex in  $V - D$  be dominated by multiple vertices in  $D$ .

**Definition 2.9:** A split dominating set  $D$  of graph  $G$  is called a **split dominating set**, if the induced sub graph  $\langle V - D \rangle$  is disconnected.

**Definition 2.10:** The **split domination number**  $\gamma_s(G)$  of  $G$  is the minimum cardinality of the split dominating set.

# Regular Inverse Secure Domination in Graphs

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**ABSTRACT:** In this paper, we have introduced regular inverse secure domination in graph and then discussed some standard theorems and examples of regular inverse secure domination in graph.

**KEYWORDS:** Domination, Secure domination, Inverse secure domination, Regular set domination, Regular set domination number.

## I. INTRODUCTION

All graphs considered in this paper are finite, undirected with no loops or multi edge. Domination in graph was introduced by Claude Berge in 1958 and Oystein Ore in 1962. That domination in graphs became an area of study of many researchers. One type of domination parameter is the secure domination in graphs. This was studied and introduced by E.J.Cockayne et al. The inverse domination in graph was first found in the paper of Kulli. In his study we introduce the new domination parameter, the regular inverse secure domination in graphs, and give some important results.

## II. PRELIMINARIES

**Definition 2.1:** Let  $G = (V, E)$  be a graph. A Set  $S \subseteq V$  is called a **dominating set** of  $G$  if every vertex in  $V \setminus S$  is adjacent to a vertex in  $S$ . A dominating set  $S$  is called a **minimal dominating set** if  $S \setminus \{v\}$  is not a dominating set for all  $v \in S$ . The minimum cardinality of a minimal dominating set of  $G$  is called the **domination number** of  $G$  and is denoted by  $\gamma(G)$ .

**Definition 2.2:** A Subset  $S$  of  $V$  is called an **independent set** if no two vertices in  $S$  are adjacent. The minimum cardinality of a maximal independent set is called the **independent domination number** of  $G$  and is denoted by  $i(G)$ .

**Definition 2.3:** A dominating set  $S$  in  $G$  is called a **secure dominating set** in  $G$  if for every  $u \in V(G) \setminus S$ , there exists  $v \in S \cap N_G(u)$  such that  $(S \setminus \{v\}) \cup \{u\}$  is a dominating set. The minimum cardinality of a secure dominating set is called the **secure domination number** of  $G$  and is denoted by  $\gamma_s(G)$ .

**Definition 2.4:** Let  $D$  be a minimum dominating set in  $G$ . The dominating set  $S \subseteq V(G) \setminus D$  is called an **inverse dominating set** with respect to  $D$ . The minimum cardinality of inverse dominating set is called an **inverse domination number** of  $G$  and is denoted by  $\gamma^{-1}(G)$ .

**Definition 2.5:** Let  $C$  be a minimum secure dominating set in  $G$ . The secure dominating set  $S \subseteq V(G) \setminus C$  is called an **inverse secure dominating set** with respect to  $C$ . The minimum cardinality of inverse secure dominating set is called an **inverse secure domination number** of  $G$  and is denoted by  $\gamma_s^{-1}(G)$ .

**Definition 2.6:** A Set  $D$  of vertices in a graph  $G = (V, E)$  is said to be a **regular dominating set** if for every set  $I \subseteq V - D$  there exists a nonempty set  $S \subseteq D$  such that  $\langle I \cup S \rangle$  is regular and for  $|I| = 1$ ,  $\langle I \cup S \rangle$  is 1-regular. The minimum cardinality of a regular set domination number is called the **regular set domination number** of  $G$  and is denoted by  $\gamma_r(G)$ .

# IRIS Crypts for Human Recognition System

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**Abstract**— In a variety of applications, the iris is a secure biometric feature that has been extensively employed for human recognition. Though, exploitation of iris recognition is forensic applications has not been informed. A most important cause is being deficient in of human friendly approaches for comparing with iris. Additionally to endorse the utilization of iris recognition in forensics, the resemblance between irises be supposed to made visualizable and understandable. In recent times, a system was proposed, known as “a human-in-the-loop iris recognition system” which was based on detecting and matching iris crypts. Structuring on this system, a new approach for detecting and matching iris crypts automatically is proposed in this work. This detection method is capable to capture iris crypts of different sizes. This matching method is considered to handle possible topological modifications in the detection of the similar crypt in diverse images.

**Index Terms**— Iris recognition, forensics, human-in-the-loop, eye pathology, ophthalmic disease, iridotomies, conjunctivitis, visible feature, corneal Oedema.

## I. INTRODUCTION

In recent times, iris recognition is fetching one of the most vital biometrics employed in recognition when imaging can be performed at distances below two meters. This significance is because of its high reliability for individual identification. Human iris has enormous mathematical advantage that its pattern inconsistency among different persons is tremendous, since iris patterns acquire a high degree of randomness. Additionally, iris is extremely stable over time. Because the idea of automated iris recognition was developed in 1987, several researchers worked meanwhile that time and they developed different dominant methods. Those methods were based on the texture variations of the iris and can be separated into different techniques e.g. phase-based methods, texture analysis, and intensity variations etc., Nowadays most of the systems is used and they required unambiguous user collaboration, demanding that the user is placed properly to attain a quality image. These systems give acoustic response to the user to make certain that they are properly situated for image acquisition. In the United Kingdom, the Iris Recognition Immigration System (IRIS) is an intended system that appropriates travelers to authorize through border control stations at various airports rapidly, confirming their identification employing automated roadblocks. CANPASS in Canada is a related program to grant regular travel to

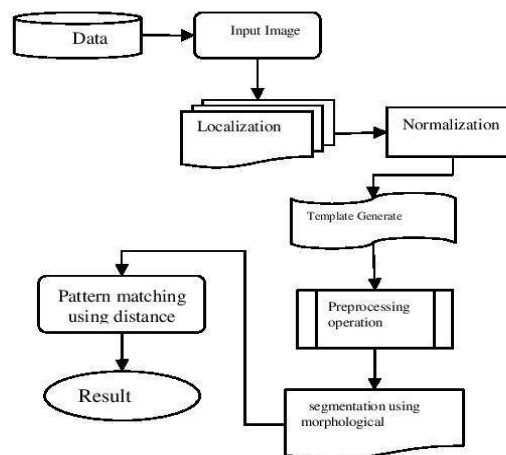
speedily proceed through security verification at airports.

## II. LITERATURE SURVEY

In last decade discussed that biometric established on the physical and behavioral features were commonly followed and were employed to recognize person uniquely in a usual and instinctive way. Biometric qualities were distinctive to the individual. Among biometric qualities e.g. face, signature, thumb etc. Iris biometric was the nearly trustworthy authentication method. Mostly commercial iris biometric systems work in a unnatural background. Iris images captured in the unnatural background have enough entropy to differentiate individual from some other. This iris recognition system depicted good recognition rate except Performance of the system degrades in noisy environment. They presented the analysis of iris recognition in fewer inhibited background. The author discussed challenges also.

Methodology of Iris recognition

There was a short of human friendly techniques for iris comparison. Therefore it had not been described in forensics applications. They required capturing iris of human and resemblances between the irises are captured. In recent times Human-in-the-loop system had been developed based on matching and detection of iris crypts. Their detection was capable to capture crypts of different sizes and capable to identified every type of topological changes. Currently iris recognition existed in Aadhar card projects. The developed method of this model was to allow for additional correctness in detecting rate and to implement in student verifications coming out for high level government oriented Examinations.





# A Survey on Fingerprint Liveness Detection Using Gradient and Texture Features

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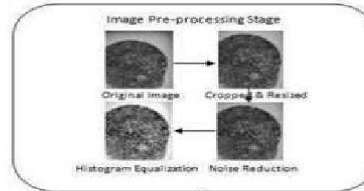
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**Abstract**— Since, today, a wide and variety of applications require reliable verification schemes to confirm the identity of an individual, recognizing humans based on their body characteristics became more and more interesting in emerging technology applications. Biometric cannot be borrowed, stolen, or forgotten, and forging one is practically impossible. Fingerprints are the only basis for individual identification by biometric authentication process. Password based authentication systems are very very less secure than that of the fingerprint authentication where fingerprints and Iris are the only unique for every individual. With the emerging use of biometric authentication systems in the past years, spoof fingerprint detection has become increasingly important. In this paper, I take a survey on a static software approach that combines all sorts of fingerprint features.

**Index Terms**—Fingerprint liveness, low level features, Gabor filters, texture analysis, Biometric Security.

## I. INTRODUCTION

Biometrics is earlier authentication system in the domain of security. Fingerprints are intrinsic to persons and can neither be lost nor stolen which makes it highly truthful and trustworthy. Furthermore, the accessibility of low-cost fingerprint readers united with easy integration capabilities has led to the broad spread use of fingerprint biometrics in a diversity of organizations. An organization can have unlimited benefits by appropriately deploying biometric technology. Today's economy is a developing one and technological progressions have altered the system in which organizations function and conduct businesses. Recent organizations require being adaptive, flexible and responsive to endure in the competitive business surroundings. Fingerprint technology can promote organizations in a diversity of segments e.g. health care, government, retail enterprises, technology organizations, manufacturing industry, libraries, universities etc Employee identification and workforce management becomes faster, exact and more proficient with fingerprint technology.



Different magnetic strip cards or passwords, individuals constantly carry their fingerprints with them and they cannot be misplaced or elapsed. Tracking attendance of employees in industrialized organizations checks employee time theft and diminish deceptive behavior. A biometric system facilitates automated calculation of employee hours therefore saving paper expenditure and time exhausted in manual settlement of attendance data.

## II. LITERATURE REVIEW

Manju Kulkarni, Harishchandra Patil [1] explained that fingerprint scanning was the one biometric identification technique presented these days that was frequently used. The security of fingerprint scanners had conversely been questioned and it had been shown that fingerprint scanners could be misled effortlessly, using easy, cheap techniques with artificial fingerprints. This work meant to explain liveness detection technique by means of first order texture features. The "Fin key Hamster" scanner artificial by "Nitgen Biometric solution, Korea", having 500 dpi resolution was utilized for this reason. To develop the database, live fingerprint of 20 persons were considered and their equivalent gummy finger by means of gelatin was made. The images were accumulated in the form of template which was created using image processing techniques. The steps comprise histogram equalization, binarisation, thinning, minutiae detection and false minutiae elimination. They developed Matching algorithm by using Euclidean distance technique. The developed algorithm for liveness was then incorporated. The consequences established perfect separation of live and not live for the normal conditions. False Rejection Ratio (FRR) was designed for genuine-live users and False Acceptance Ratio (FAR) was for genuine-not live, imposter-live and imposter-not live and obtained within acceptable range.

# A Literature review on Video Content Sharing with Security using Time-domain Attribute

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**Abstract—** Internet is gaining more and more popular now a days, so there is need to provide security for everything on internet. One of the most important concepts where we need to provide higher security is in communication between sender and receiver. Due to security threats the requirement of the secure transmission of the data is also increased the reason for developing the Data Hiding is the easy access of images, documents confidential data by the hackers who always monitor the system. Data hiding is the process of secretly embedding information inside a source without changing its content and meaning there is numerous techniques which hides the data. This paper aims to implement data hiding in compressed video. Like data hiding in images and raw video which operates on the images themselves in the spatial or transformed domain which are vulnerable to steganalysis. The sender first uses the steganographic application for encrypting the secret message. For this encryption, the sender uses text document in which the data is written and the image as a carrier file in which the secret message or text document to be hidden. The sender sends the carrier file and text document to the encryption phase for data embedding, in which the text document is embedded into the image file. In encryption phase, the data is embedded into carrier file which was protected with the password now the carrier file acts as an input for the decryption phase. The image in which data is hidden i.e. the carrier file is sent to the receiver using a transmission medium. E.g. Web or e-mail. The receiver receives the carrier file and places the image in the decryption phase. Now the carrier file acts as an input for the decryption phase. The image in which data is hidden the carrier image is sent to the receiver using a transmission medium. E.g. Web or e-mail. The receiver receives the carrier file and places the image in the decryption phase.

**Index Terms—** Streaming media, Access Control, Time domain analysis, Encryption, Video Content Sharing.

## I. INTRODUCTION

With the rapid development of communication technologies and mobile devices, video applications (e.g., video chat, video conference, movies, short sight, etc.) have become more and more popular in our daily life.

Meanwhile, the demands on video quality and user experience have also been increasing significantly in many video applications, such as Ultra-high definition (UHD) live streaming, 3D movies, instant high definition (HD) video messages and so on. The ever-increasing demands pose great challenges on video processing, coding, presentation as well

as communication, especially when the resources of media devices (e.g., bandwidth, power and computation) are limited.

Cloud computing, due to its flexible, scalable and economic resources, is a natural fit for storing, processing and sharing multimedia contents.

### A. Video Processing

Video processing is a method to convert a video into digital form and perform some operations on it, in order to get an enhanced video or to extract some useful information from it. It is a type of signal dispensation in which input is video, like video frame or photograph and output may be image or characteristics associated with that image. Usually video Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them.

It is among rapidly growing technologies today, with its applications in various aspects of a business. Video Processing forms core research area within engineering and computer science disciplines too.

### B. Steganography Image Analyses

There are currently three effective methods in applying Image Steganography: LSB Substitution, Blocking, and Palette Modification1. LSB (Least Significant Bit).

Substitution is the process of modifying the least significant bit of the pixels of the carrier image. Blocking works by breaking up an image into blocks and using Discrete Cosine Transforms (DCT).

Each block is broken into 64 DCT coefficients that approximate luminance and color the values of which are modified for hiding messages. Palette Modification replaces the unused colors within an image's color palette with colors that represent the hidden message. I have chosen to implement LSB Substitution in my project because of its ubiquity among carrier formats and message types.

With LSB Substitution I could easily change from Image Steganography to Video Steganography and hide a zip archive Instead of a text message. LSB Substitution lends itself to become a very powerful Steganography method with few limitations.

LSB Substitution works by iterating through the pixels of an image and extracting the ARGB values. It then separates the color channels and gets the least significant bit. Meanwhile, it also iterates through the characters of the message setting the bit to its corresponding binary value3.

## TOTAL COLORING REGULAR DOMINATION in FUZZY GRAPH

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S. Tharani\*\*

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### Abstract

In this paper we discuss the concept of total coloring Regular domination in fuzzy graph. We determine the chromatic number  $\chi^{rf}$  for a Regular domination fuzzy graph  $G_k$ , with fuzzy set of vertices and fuzzy set of edges in terms of family of fuzzy sets.

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### Keywords:

Regular fuzzy graph,  
Domination in fuzzy graph,  
Regular domination in fuzzy graph,  
Fuzzy total coloring,  
Chromatic Number.

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### I. INTRODUCTION

As a advancement fuzzy coloring of a fuzzy graph was defined by authors Eslahchi and Onagh in 2004, and later developed by them as fuzzy vertex coloring [1] in 2006. This fuzzy vertex coloring was extended to fuzzy total coloring in terms of family of fuzzy sets by Lavanya. S and Sattanathan.R [2]. On Regular Fuzzy Graphs was defined by the authors A. Nagoor Gani and K. Radha[3].



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## DOMINATION IN FUZZY PLANAR GRAPH

M. Nithya Kalyani\*

S. Manonmani\*\*

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### Abstract

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#### Keywords:

Fuzzy graph,  
Fuzzy planar graph,  
Domination in fuzzy  
planar graph,  
Domination in strong  
fuzzy planar graph,

Fuzzy Planar Graph is an important subclass of fuzzy graph. In this paper we introduced the concept "Domination in Strong and Isomorphic Fuzzy Planar Graph". It is combination of domination and fuzzy planar graph. We discussed in this paper various properties like domination in fuzzy planar graph ( $v_{FP}$ ), domination in strong fuzzy planar graph ( $v_{SFP}$ ), domination in isomorphic fuzzy planar graph ( $v_{IFP}$ ), domination in fuzzy planar graph with planarity.

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## I. INTRODUCTION

Graph Fuzzy graph and Planar graph are the sub-class of graph theory. Combination of these two graph is called "Fuzzy Planar Graph". One of the fastest growing areas within graph theory is the study of domination.

We discussed the concept of dominating graph were introduced by V.R. Kulli and Bidarhalli Janakiraman[3]. We used the Concept Of Fuzzy Planar Graph with using planarity value is introduced by Sovan Samantha, Anita Pal, Madhumangal Pal [6] and Domination in

## A SURVEY ON VARIOUS TECHNIQUES OF FREQUENT ITEMSET MINING

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*Abstract: The Paper is to address some issues based on the traditional FIM which may discover a large amount of frequent but low-value item sets and lose the information on valuable item sets having low selling frequencies. Hence, it cannot satisfy the requirement of users who desire to discover item sets with high utilities such as high profits. Here, is an attempt to enhance the existing framework for top-k high utility itemset mining, and propose a new enhanced model of Mining of High Utility Itemsets using Faster High-Utility itemset miner with Negative unit profits. We are aware that in the data mining field, the high utility mining is a recent trend of the domain. The task completes the identification of more profitable itemsets which we call and represent it as high utility itemsets in the large transactional databases. In recent more algorithms are introduced for this propose, but many did not considered the point of negative unit profits. The existing works are also considered only positive unit profits. But, we know that the current transactional databases will have both positive and negative unit profits. To compute high utility itemsets with both positive and negative unit profits is a more costly and so we need to design the proposed model more efficient and cost effective. Considering the existing pitfalls, we proposed the reinforced model with FHN (Faster High-Utility itemset miner with Negative unit profits). The proposed model incorporates both positive and negative unit profits and thus the objective of efficient high utility mining will be achieved. Keyword - Frequent Itemset mining, Closed High Utility Itemset, Utility mining*

### I. INTRODUCTION

Data Mining consists mining huge amount of data using different mining techniques to derive useful and important information i.e. discovery of knowledge. Organizations use such knowledge for based on their related purposes. Frequent

Itemset Mining (FIM) is a modern technique for market basket analysis i.e. discovery of itemsets that customer purchase together frequently. Present problem of FIM model that it generates high volume of frequent itemsets and avoids low selling frequencies. Generated itemsets may have low revenues and less frequent itemsets may generate high revenue. FIM treats every item with same importance, profit and weight and it assumes an item can be either present or absent i.e. binary representation of itemsets in transaction. To recover from this problem, utility mining concept is emerged. A utility of an itemset is measured in cost, weight, quantity, profit etc. If the utility of an itemset is greater than user-specified minimum utility threshold then it is said to be high utility itemset otherwise it is considered as a low utility itemset. High utility mining has wide application. HUI may use to find large amount of high utility itemsets causes difficulty to the user for result analysis. It also needs more memory and processing time to be less efficient. To reduce cost and mining task and to provide good results in FIM we introduce Freeset, Non derivable sets, Closed Itemsets.

### II. LITERATURE SURVEY

This section depicts the existing works studied by other researchers related to the Frequent Itemset Mining. Vincent E. Teseng et al discussed about the closed frequent itemset mining concepts. They depicted a lossless data model for High Utility Itemset mining. They suggested three algorithms, namely, AprioriCH (Apriori-based algorithm for mining High utility closed itemsets), AprioriHC-D (AprioriHC algorithm with Discarding unpromising and isolated items) and CHUD (Closed High Utility Itemset Discovery) to find this representation. In addition to, they have suggested another model Derive All High Utility Itemsets which extracts the data without the help of source database. Though, the models were efficient, it failed to support larger number of candidate's

# A Survey on Distributed Intrusion Detection System For Cognitive Radio Networks Based On Weighted Fair Queuing Algorithm

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*Abstract - Reliable detection of intrusion is the basis of safety in cognitive radio networks (CRNs). So far, few scholars applied intrusion detection systems (IDS) to combat intrusion against CRNs. In order to improve the performance of intrusion detection in CRNs, a distributed intrusion detection scheme has been proposed. In this paper, a method base on Dempster-Shafer's (DS) evidence theory to detect intrusion in CRNs is put forward, in which the detection data and credibility of different local IDS Agent is combined by D-S in the cooperative detection center, so that different local detection decisions are taken into consideration in the final decision. The effectiveness of the proposed scheme is verified by simulation, and the results reflect a noticeable performance improvement between the proposed scheme and the traditional method.*

**Keywords-** Safety, cognitive radio networks, intrusion detection, IDS Agent, cooperative detection center, Dempster-Shafer's evidence theory

## I. INTRODUCTION

A secure computer system provides guarantees regarding the confidentiality, integrity, and availability of its objects (such as data, purpose, or services). However, systems generally contain design and implementation flaws that result in security vulnerabilities. An intrusion can take place when an attacker or a group of attackers exploits the vulnerabilities and thus damages the confidentiality, integrity or availability guarantees of a system. Intrusion Detection Systems (IDSs) detect some set of intrusions and execute some predetermined actions when an intrusion is detected. Over the last one and half decade, research in the field of intrusion detection has been heading towards a distributed framework of systems that do local detection and provide information to perform global

detection of intrusions. These distributed frameworks of intrusion detection have some advantages over single monolithic frameworks. Most of these distributed systems are hierarchical in nature. The local intrusion detection components look for local intrusions and pass their analysis results to the upper levels of the hierarchy. The components at the upper levels analyze the refined data from multiple lower level components and attempt to establish a global view of the system state. However, such IDSs are not fully distributed systems because of the centralized data analysis performed at the higher levels of the hierarchy [1]. In this paper, an agent-based architecture is proposed for performing intrusion detection in a distributed environment. By employing a suitable communication mechanism, the resource overhead is minimized in the distributed intrusion detection process. In this section, some of the existing distributed IDS frameworks are discussed briefly. DIDS [2] is a distributed intrusion detection system consisting of host managers and LAN managers doing distributed data monitoring, and sending notable events to the DIDS director. These managers also do some local detection, passing the summaries to the director. The director analyzes the events to determine the security state. AAFID [3] is a distributed IDS developed in CERIAS at Purdue University. It employs agents at the lowest level of the hierarchy for data collection and analysis and transceivers and monitors at the higher levels for controlling agents and obtaining a global view of activities. It provides a subscription-based service to the agents.

## II. LITERATURE REVIEW

JaydipSen, A Survey on Wireless Sensor Network Security [1] Wireless sensor networks (WSNs) have recently attracted a lot of interest in the research community due their wide range of



## Harmony Search Optimization Algorithm Based Multilevel Thresholding for MRI Brain Images

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### ABSTRACT

Segmentation is a partitioning portion of an image. The fundamental idea of thresholding is to choose an optimal gray level threshold value for separating objects from the background based on their gray level distribution. Segmentation is very difficult of medical images. The harmony search is a evolutionary algorithm which is motivated in musicians improvise new harmonies while playing. In this thesis is used a Multilevel Thresholding (MT) algorithm based on the harmony search optimization algorithm. The approach combines the good search capabilities of harmony search optimization algorithm with objective functions recommended by the multilevel thresholding methods of Otsu's and Kapur's. The proposed algorithm, the original brain image is converting to gray scale image and calculate the histogram of the image. The random samples will be taken from the inside of the histogram image. That samples put up the each harmony in the Harmony Search Algorithm (HSA) background, while its quality is evaluated considering the objective function that is working by the Otsu's or the Kapur's method. The set of aspirant solutions are evaluated by the objective functions and HSA operators until the best possible solution is found. These approach is generates a multilevel thresholding algorithm which is can efficiently identify the threshold values for a Magnetic Resonance Imaging (MRI) brain image within a minimum number of iterations. The quality of output image is measured by Peak Signal to Noise Ratio (PSNR) and Jaccard's Similarity Coefficient.

**Keywords:-** Thresholding, Niblack, Sauvola, PSNR, Jaccard

### I. INTRODUCTION

Image processing is an essential part of signal processing in which input and output are taken as image or image parameters. An image is two dimensional function of  $f(x, y)$  where  $x, y$  are spatial coordinates called as pixels and amplitude of  $f(x, y)$  at any pair of coordinates  $(x, y)$  is called the intensity or gray level of image at that point. Image is basically processed in spatial and frequency domain. Spatial domain refers to the image plane itself, it is based on the straight manipulations of the pixels in the image. Frequency domain refers to an image which is processed in the form of sub bands and it is applicable to all transformations such as Discrete Wavelet Transform (DWT), Discrete Fourier Transform (DFT) [1].

Thresholding method can be chosen manually according to a priori information or routinely by image information. Thresholding is a simple for image segmentation it separating the pixel which is white as objects and black as a background. Thresholding technique is convert the gray scale image into binary image, it select a proper threshold value  $T$ , whether  $T$  is constant to separate the pixel into objects from background. If pixel intensity is greater than or equal to threshold value  $f(x, y) \geq T$ , it considered the object, otherwise the pixel belong to background. Selection of the threshold value the thresholding methods is divided into two types, global and local thresholding. In Global thresholding methods can be unsuccessful when the background clarification is

uneven. In local thresholding, multiple thresholds are used to recompense for uneven illumination. Threshold value chosen is classically done interactively though it is possible to derive automatic threshold value selection algorithm [13].

#### TYPES OF THRESHOLDING

##### 1.1 Global Thresholding

Histogram of the image  $f(x, y)$  is collected of light as an object and dark as background. The intensity pixel value of the object and background are grouped into two modes. In global thresholding, a thresholding value  $T$  separate the object and background. The state for choosing threshold  $T$  is given as follows:

$$g(x, y) = \begin{cases} 1, & \text{iff } f(x, y) > T \\ 0, & \text{iff } f(x, y) \leq T \end{cases}$$

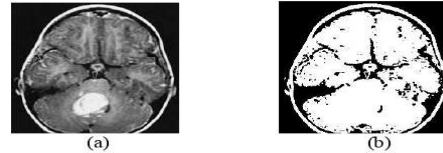


Figure 1. a) Original Image b) Using Global Thresholding

## DATA SECURITY IN NETWORK FLOW USING OBFUSCATION TECHNIQUE

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**Abstract** - An application encompasses network modeling and simulation, recognition of privacy assaults, and formalization of research results. Indeed, existing techniques for network flow sanitization are vulnerable to different kinds of attacks, and solutions proposed for micro data anonymity cannot be directly applied to network traces. In our previous research, we proposed an obfuscation technique for network flows, providing formal confidentiality guarantees under realistic assumptions about the adversary's knowledge. Put forward an obfuscation technique that leads to confidential guarantee of IP address thus securing the sensitive data. In this paper, we identify the threats posed by the incremental release of network flows and by using SHA3 algorithm we formally prove the achieved confidentiality guarantees. For this operation, a fingerprint is created which is based on the configuration of the system. We group hosts based on the fingerprint and obfuscated address and secure the IP address during the release of incremental network flows. Then, the process of grouping is done using the generated signature. Group intimation is done and the set of IP addresses and signature are compared and the requested signature is sent as response. All this processes occur with an intermediate router. Only, the obfuscated signature will be visible to the hacker.

**Key Words:** Security, Incremental release, Obfuscation, Code Security, Code obfuscation techniques, Privacy

### 1. INTRODUCTION

Obfuscation is the obscuring of intended meaning in communication, making the message confusing, will fully ambiguous, or harder to understand. It may be intentional or unintentional (although the former is usually connected) and may result from circumlocution (yielding wordiness) or from use of jargon or even argot (yielding economy of words but excluding outsiders from the communicative value). Unintended obfuscation in expository writing is usually a natural trait of early drafts in the writing process, when the composition is not yet advanced, and it can be improved with critical thinking and revising, either by the writer or by another person with sufficient reading comprehension and editing skills. Similarly, Internet flows may reveal personal communications among specific individuals, such as e-mail exchanges and chat sessions among them. On the other hand, those datasets may also help an adversary to perform security attacks. For instance, observing the traffic of a target network, an adversary could identify possible bottlenecks to be exploited for denial-of-service (DoS) attacks. For these

reasons, several techniques were proposed to sanitize network flows while preserving their utility. Early techniques (e.g., Crypto-PAn) were based on the substitution of the real IP addresses with pseudo-IDs. However, that method proved to be vulnerable to different kinds of attacks, based on the knowledge of network characteristics, or on the capacity to inject bogus flows in the monitored network. More recently, several techniques have been proposed to avoid the re-identification of IP addresses, based on the perturbation of other fields of the flows. However, those techniques do not provide any formal confidentiality guarantee, and it has been recently shown that they are prone to different kinds of attacks. In our previous work, we have presented -obfuscation, an obfuscation technique for network flows, which provides formal confidentiality guarantees under realistic assumptions about the adversary's knowledge, while preserving the utility of released data. In that work, we assumed a single release of the whole dataset of flows. However, the incremental release of network flows represents a clear practical advantage. For instance, suppose that an organization wishes to share a month of network flows. Without the incremental release, it would be necessary to wait until the end of the month to start releasing the dataset. Through incremental releases, the organization could provide a more time sharing of network flows choosing a per-week or even a per-day schedule. Moreover, the incremental release provides important technical advantages. Indeed, the computational costs and the memory requirements for obfuscating a large dataset could be strongly reduced by partitioning the dataset in smaller subsets and by running the obfuscation process independently on each subset. Each IP-group contains at least different IP addresses that appear in. Formally, for each group-ID appearing in a flow, there exists a set of at least IP addresses appearing in a flow in such that, for each group-ID,  $p1$ : Each flow is fp-indistinguishable in a set of at least flows in originated by distinct IP addresses belonging to the same IP-group. is undefined if the above properties cannot be satisfied—i.e., if involves less than different IP addresses (it is impossible to enforce  $p1$ ) or if contains less than flows (it is impossible to enforce  $p2$ ). An extensive experimental evaluation of the algorithm for incremental (K,j) obfuscation, carried out with billions of real flows generated by the border router of a commercial autonomous system. We made experiments on traffic diversity, statistical analysis of flow fields, and network flow analysis. Our results show that our technique preserves the data quality in both the single and the incremental release. Early techniques for network



# Security Enhanced Multi-Factor Biometric Authentication System Using FFF and KSVM

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## ABSTRACT

In this study we focus on multimodal biometric system by combining finger knuckle and finger vein using feature level fusion optimization. Biometric characteristics (Eyes, Finger vein, Finger Knuckle, Face, Ear, and Palm) like. Here used unique and secure password (like Finger Vein, Finger Knuckle). In this paper, the authors propose a multimodal biometric system by combining the finger knuckle and finger vein images at feature-level fusion using fractional firefly (FFF) optimization. Biometric characteristics, like finger knuckle and finger vein are unique and secure. Initially, the features are extracted from the finger knuckle and finger vein images using repeated line tracking method. Then, a newly developed method of feature-level fusion using FFF optimization is used. This method is utilized to find out the optimal weight score to fuse the extracted feature sets of finger knuckle and finger vein images. Thus, the recognition is carried out by the fused feature set using layered k-SVM (k-support vector machine) which is newly developed by combining the layered SVM classifier and k-neural network classifier. The experimental results are evaluated and the performance is analyzed with false acceptance ratio, false rejection ratio and accuracy. The outcome of the proposed FFF optimization system obtains a higher accuracy.

**Keywords** : Feature Level Fusion, FFF Optimization, Repeated Line tracking method, Layered K-SVM, K-neural network classifier.

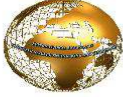
## I. INTRODUCTION

Nowadays, many of the multimodal biometric systems are in use and gained a lot of importance due to its uniqueness and effectiveness. The multimodal biometric systems include hand geometry, signature, retinal pattern, iris, voice-print, finger knuckle, fingerprint, finger vein, face and so on. The advantages and disadvantages of the biometric systems are based on the three main factors, such as user acceptance, accuracy and applicability. The accuracy of the iris pattern, retinal pattern and face is minimal, when compared to the finger knuckle and the finger vein traits. User acceptance is also very

high for the finger knuckle and the finger vein compared to the other biometric traits.

The performance is also good for the finger knuckle and the finger vein due to the finger geometry. In addition to, security, non-traceability, speed, user friendly, accuracy and so on is the advantages of the finger vein. The integration of the feature sets is used to enhance the outcome of the recognition of the biometric system by the corresponding multiple modalities. The integration of the feature is done in three ways, such as feature-level fusion, score-level fusion and decision-level fusion. The integration of the feature set is difficult, when (i) the feature sets of multiple modalities are incompatible, (ii) unknown





# An Analytical Study on the Medical Image Compression Techniques

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**Abstract:** An region of interesting compression algorithm of still image is introduced. The algorithm that is based on embedded block coding with optimized truncation (EBCOT) encodes the interested region of the image. According to the character of image edge, an improved canny edge detection algorithm is proposed before the wavelet transform, without the participation of automatic extraction of artificial region-of-interest (ROI) by using the dilation and erosion operation in morphology. The ROI coding algorithms is analysed. ROI information can be encoded with high priority at the same time by constructing a weighted function, giving reasonable weight for ROI code block, and reducing the wavelet coefficients effect on the context region of the ROI code block. The proposed method improves the quality of the reconstructed image of ROI. Experiments show that the reconstructed ROI image quality is significantly improved under low bit rate or high, and the reconstructed image background region (BG) quality can be also improved.

**Index Terms:** ROI, Region Of interest, Embedded Block Coding

## INTRODUCTION

Medical imaging is an evolving and growing area of research and development both in academia as well as in industry. It involves interdisciplinary research and development encompassing diverse domains. New techniques and directions are being proposed in the literature every day. The medical equipment's of today's modern era are creating huge number of high resolution images that are used by medical practitioners during analysis and diagnosis. These images while are revolutionizing the healthcare industry creates the problem of storage and transmission. For example, an image of size  $512 \times 512$  pixels created by CT (Computed Tomography) requires about 1/4 MB of storage space, thus stressing the need for image compression algorithms. Image compression is the process of eliminating redundant data in an image in a fashion that minimizes the storage space requirement while maintaining the quality of the image. The algorithms used for this purpose are categorized as lossy and lossless, out of which lossless techniques are more popular in the medical domain. The reason behind this popularity is the need for recovering the decompressed image which is exactly the same as the original image. As healthcare professionals require accurate and clear picture, lossless techniques are not frequently used. Owing to the great demand for high compression ratio while maintaining high image quality, recently, Region of Interest (ROI) techniques have become acknowledged in medical compression. The main advantage of using ROI-based compression techniques is that it combines the usage of both lossy and lossless techniques to compress images. Here, an image is initially segmented into two regions, interested and not-interested regions. It is assumed that the Interested Region (IR) consist of the most important part that has diagnostic/medicinal important, while the Not-Interested Region (NIR) has data that are not considered vital for diagnosis purposes. During Compression, a lossless technique is used for IR while a lossy technique is used on NIR. The method used for determining the ROI in medical images is still an active research area. The method used can be either manual or automatic, both with the same aim of achieving optimal compression balance between lossy and lossless regions.

## II. RELATED WORK

### ROI Based Image Compression

Lossy compression techniques give better compression results with the accuracy compromised, they are used only for non crucial regions of the image. The crucial regions are compressed using lossless compression techniques. This increases the efficiency of process by retaining the accuracy of crucial region alone and the rest of the region is not given much importance on accuracy. For the industrial weld radiographic images, the modified Tsallis entropy expression gives the threshold value. Based on this threshold value, the image is divided into ROI and non-ROI. The ROI contains the details about weld part and non-ROI contains details about the rest of the part. Similarly for the medical radiographic image, the ROI contains details about bone or other diagnostically important parts (Gokturk., 2001). The non-ROI contains details about background of the image or rest of the parts. Generally, Huffman coding is used since it is lossless coding algorithm. It has many advantages like it uses small code words for high probability elements and the converse for the lesser probable elements. Applying Huffman coding in the digital image segmented using modified Tsallis entropy thresholding method satisfies the previously mentioned criteria. It compresses the region of interest effectively since the segmentation of image converts the pixels intensity at region of interest to white (1) while the other pixels into black (0). The ROI in the actual image is identified by retaining the values of the pixel for which the values are 1 in the segmented image. The values of all other pixel are made as zero. The entire image obtained after this process is compressed using the Huffman compression. These steps constitute the compression part which completes by transmitting the compressed image to the required destination. Along with the compressed image the corresponding dictionary and some other important details like the size of image data at various stages that will be used for decompression or extraction. The transmission of compressed image has advantages like reduced bandwidth requirements, high speed and therefore low time. Also, security is increased since the compressed data is not meaningful if viewed by any third party without proper decoder. The other side receives these details and reconstructs the image using the same Huffman coding and the dictionary. The resulting image is of the same details at the region of interest i.e. crucial regions but varies at other non-crucial areas.

## III. METHODOLOGY

Automatic image segmentation techniques can be classified into four categories, namely, (1) Clustering Methods, (2) Thresholding Methods, (3) Edge-Detection Methods, and (4) Region-Based Methods.

### 1. Clustering Methods

Clustering is a process whereby a data set (pixels) is replaced by cluster; pixels may belong together because of the same color, texture etc. There are two natural algorithms for clustering: divisive clustering and agglomerative clustering. The difficulty in using either of the methods directly is that there are lots of pixels

# Inverse Domination And Inverse Total Domination In Digraph

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**Abstract** — In this paper, we discussed about the various properties like domination in graph, Inverse domination in graph, Inverse total domination in graph, domination in digraph. Domination in graphs has been studied extensively. In contrast, there has been relatively little research involving domination in digraphs. In a digraph  $D$ , a vertex  $v$  openly (or 1-step) out-dominates every vertex to which  $v$  is adjacent and openly in-dominates every vertex from which  $v$  is adjacent. Let  $D = (V, A)$  be a digraph. A subset  $S$  of  $V$  is called a dominating set of  $D$  if for every vertex  $v$  in  $V - S$ , there exists a vertex  $u$  in  $S$  such that  $(u, v) \in A$ . A subset  $S$  of  $V$  is called a total dominating set of  $D$  if  $S$  is a dominating set of  $D$  and the induced sub digraph  $\langle S \rangle$  has no isolated vertices. The inverse domination number  $g'(G)$  of  $G$  is the order of a smallest inverse dominating set of  $G$ . The exact values of  $g'(G)$  for some standard graphs and also establish some general results on parameter. The study of inverse total domination in graphs and present some bounds and some exact values for  $\gamma_t'(G)$ . Also, some relationships between for  $\gamma_t'(G)$  and other domination parameters are established. The inverse domination parameters corresponding to domination and total domination in digraphs and establish some results on these parameters. Also we introduce the disjoint domination parameters corresponding to domination and total domination in digraphs.

**Keywords:** domination in graph, Inverse domination in graph, Inverse total domination in graph, domination in digraph, total domination in digraphs.

## I. INTRODUCTION

The study of domination set in graphs was begun by V.R. Kulli and Janakiram [3]. I learned the applications of domination in graph theory in [3,4,5]. Attained the graph of Inverse domination in graphs in [7]. Acquired the domination number  $g(G)$  of  $G$  is the order of a smallest dominating set in  $G$ . Domination in Digraphs were known in [1,2,9,11,12]. Gain the knowledge of Application of inverse total domination in [6,8,10].

## II. PRELIMINARIES

### A. Definition

The dominating graph  $D(G)$  of a graph  $G = (V, E)$  is a graph with  $V(D(G)) = V(G) \cup S(G)$  where  $S(G)$  is the set of all minimal dominating sets of  $G$ , with  $u, v \in V(D(G))$  adjacent if  $u \in V(G)$  and  $v$  is a minimal dominating set of  $G$  containing  $u$ .

### B. Definition

The minimal dominating graph  $MD(G)$  of  $G$  is the intersection graph on the minimal dominating sets of vertices in  $G$ .

### C. Definition

If a graph  $G$  is said to be a vertex minimal dominating graph  $M_v D(G)$  of  $G$  if the graph having  $V(M_v D(G)) = V(G) \cup S(G)$ , where  $S(G)$  is the set of all minimal dominating sets of  $G$  and two vertices  $u$  and  $v$  adjacent if they are adjacent in  $G$  or  $v = D$  is a minimal dominating set containing  $u$ .



# HOTEL MANAGEMENT SYSTEM

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**ABSTRACT:**-Hotel management is a (web portal) that helps you manage reservations, bookings, guests and agents. This has been made in a user friendly interface. The user can search for the vacant rooms in the hotel and book for it. Booking can only be done by registered guests or through agents. The rooms will be added or updated by the admin and the same would be available for the guests to book them. A user is added by the admin, and is given the access for any of the rights that include adding guests and agents, reservation, booking, billing, viewing reports, etc. Admin module is designed to ensure options of add, edit and delete the contents of the various pages in an easy format. Admin has control over the clients/users accessing the data and if required block users. An admin can view the booking details, transactions and coordinate the activity with the agents. He can track the entire site activity Reservations can also be made by the admin, at the back end, through a phone call or an email. He can also send an SMS to the registered users

Users can either be browsers or registered users. Registered users have privilege to access certain sections of data. There is a standard registration procedure for users/clients. Navigation ensures easy access to the user to all the material being displayed.

## I. INTRODUCTION

HOTEL MANAGEMENT SYSTEM is a hotel reservation site script where site users will be able to search room's availability with an online booking reservations system. Site users can also browse hotels, view room inventory, check availability, and book reservations in real-time. Site users enter check in date and check out date then search for availability and rates. After choosing the right room in the wanted hotel – all booking and reservation process is done on the site and an SMS is sent to confirm the booking.

The project, Hotel Management System is a web-based application that allows the hotel manager to handle all hotel activities online. Interactive GUI and the ability to manage various hotel bookings and rooms make this system very flexible and convenient. The hotel manager is a very busy person and does not have the time to sit and manage the entire activities manually on paper. This application gives him the power and flexibility to manage the entire system from a single online system. Hotel management project provides room booking, staff management and other necessary hotel management features. The system allows the manager to post available rooms in the system. Customers can view and book room online. Admin has the power of either approving or disapproving the customer's booking request. Other hotel services can also be viewed by the customers and can book them too. The system is hence useful for both customers and managers to portable manage the hotel activities.

## II. OVERVIEW OF THE PROJECT

The mission is to facilitate easy management and administration of a hotel with capabilities to do Booking or reservations of the rooms, Cancellation of the rooms, Cash billing, Room service, Restaurant service, Restaurant Billing, Total Billing, Travels arrangement etc. using the automated hotel management software. One can keep detailed records or info on an unlimited amount of customers. The system lets the user Know which all rooms are available for occupancy at any point of time. This makes the Booking considerably faster. And thus helps the hotel in better management and reduce a lot of paper work as well as manpower.





# Complaint Management System

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**ABSTRACT:**The Complaint Management system is web based application and it is designed to keep track of complaints registered by the college municipality/lab staffs, so this system need to have distributed platform independent web application. The task of Administrator executives can control all the activities in the system, for creating issue using call registration, assign to service engineer and check the service engineer's performance. In call registration it should be open and assigned to service and engineer can update the call status to close. This System able to show the reports like department wise pending closed calls, open calls, Daily call registration and Engineer performance Report.

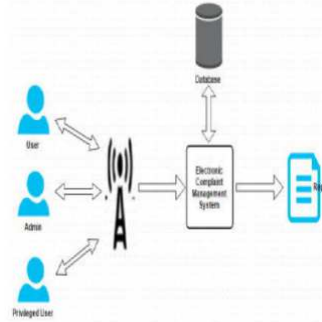
## I INTRODUCTION

The main objective of this Complaint Management system is to focus on the issues related to internal system. Complaint Management system is a platform independent application, so this web application can be accessed anywhere in the system. This is also developed for reduces the communication cost between the staffs and to provide the efficient service to their staffs.

The system need to provide the services to the user who is accessing this system from the collected information and this system gathering Call Registration about the issues to provide services. This system which could enhance the day to day activities of the business with efficiency and corectness. Once the call Registered by the staff/user, it should be assigned to service engineers and update the calls as quickly as possible. There are various modules involved in the system.

## II OVERVIEW OF THE PROJECT

The system is Client-server application designed by keeping in view the various activities that are performed at internal complaint management system. Staffs need to register their call registration regarding the issues faced on day-to-day hardware and software issues in this system and also register their clients. This web service is designed to provide the various services to the clients it uses the web server and application server. Server receives the various requests from the client and the server has to respond the client's request.



System Architecture



# Development of an Online Course Portal for a Campus

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**ABSTRACT:**-This project aims at creating a Courses portal for a campus/organization. This allows registered users of the system to join a course available in the site and access the materials published for the course. People can register themselves as students of a course or Faculty for a course. When a person registers himself as a Faculty, an approval mechanism should be triggered which sends an email to the Administrator for approving the person as a Faculty. There will be an admin approval page where admin can approve the faculty members for the course.

The course home page should contain the title of the course and a brief description. There will be a discussion board for each course where students can interact, an announcement section, which contains the latest announcements, and a course content section which gives the links for the material available for the course. For faculty members there will be an extra link for uploading the course content in a zip file format. The course content should be html pages, which should be uploaded in the zip file format. There should be a mechanism for the faculty members to create a test for the course specifying the test title and a set of multiple-choice questions and duration of time of the test.

## I. INTRODUCTION

This project aims at creating a Courses portal for a campus/organization. This allows registered users of the system to join a course available in the site and access the materials published for the course. People can register themselves as students of a course or Faculty for a course.

When a person registers himself as a Faculty, an approval mechanism should be triggered which sends an email to the Administrator for approving the person as a Faculty. There will be an admin approval page where admin can approve the faculty members for the course.

The course home page should contain the title of the course and a brief description. There will be a discussion board for each course where students can interact, an announcement section, which contains the latest announcements, and a course content section which gives the links for the material available for the course. For faculty members there will be an extra link for uploading the course content in a zip file format.

## II. OVERVIEW OF THE PROJECT

The course content should be html pages, which should be uploaded in the zip file format. There should be a mechanism for the faculty members to create a test for the course specifying the test title and a set of multiple-choice questions and duration of time of the test.



## E-COMMERCE ONLINE SHOPPING

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**ABSTRACT:**In today's fast-changing business environment, it's extremely important to be able to respond to client needs in the most effective and timely manner. If your customers wish to see your business online and have instant access to your products or services. Online Shopping is a lifestyle e-commerce web application, which retails various fashion and lifestyle products (Currently Men's Wear). This project allows viewing various products available enables registered users to purchase desired products instantly using PayPal payment processor (Instant Pay) and also can place order by using Cash on Delivery (Pay Later) option. This project provides an easy access to Administrators and Managers to view orders placed using Pay Later and Instant Pay options. In order to develop an e-commerce website, a number of Technologies must be studied and understood. These include multi-tiered architecture, server and client side scripting techniques, implementation technologies such as ASP.NET, programming language (such as C#) and relational databases. This is a project with the objective to develop a basic website where a consumer is provided with a shopping cart application and also to know about the technologies used to develop such an application. This document will discuss each of the underlying technologies to create and implement an ecommerce website.

### I INTRODUCTION

E-commerce is fast gaining ground as an accepted and used business paradigm. More and more business houses are implementing web sites providing functionality for performing commercial transactions over the web. It is reasonable to say that the process of shopping on the web is becoming commonplace. The objective of this project is to develop a general purpose e-commerce store where product like clothes can be bought from the comfort of home through the Internet. However, for implementation purposes, this paper will deal with an online shopping for clothes. An online store is a virtual store on the Internet where customers can browse the catalog and select products of interest. The selected items may be collected in a shopping cart. At checkout time, the items in the shopping cart will be presented as an order. At that time, more information will be needed to complete the transaction. Usually, the customer will be asked to fill or select a billing address, a shipping address, a shipping option, and payment information such as credit card number. An e-mail notification is sent to the customer as soon as the order is placed.

### II OVERVIEW OF THE PROJECT

The motivation for designing this shopping-cart application came because I love online shopping rather than spending lot of time at physical markets. Further, using the available stores to sell the products, there is also the possibility of designing one's own customized shopping-cart application from scratch because custom-designed platforms are expensive.





# Evaluating Retailers in a Smart-Buying Environment using Smart City Infrastructures

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**Abstract:**In modern cities, most citizens are interested in buying from e-shops or mostly buy from large shopping brands. This is a challenge for small and medium-sized retailers, who cannot afford to maintain IT infrastructures and skills. The ongoing R&D project SMARTBUY, tries to close this gap by providing a platform for small and medium-sized retailers to become the place where they can easily make their products and promotions visible online for local audiences, along with a mobile application for customers. An important issue in this context is the evaluation of the retailers. In this work, we introduce a new evaluation application for assessing the quality of the retailer services. Customers have the chance to rate the behavior and the offers that the retailers provide to them. This evaluation service is based on the SMARTBUY platform and is developed upon the Organic City Experimentation Platform. The evaluation application is a novel approach to generate knowledge for the retailer shops inside a future city using both data from open city datasets as well as feedback from citizens. Such an application is deemed useful to both customers, to identify retailers with best offers and services, and retailers as an incentive to improve their services.

## I INTRODUCTION

The idea of "Smart- City" is regularly alluded to in scholarly exploration, in writing, and in government reports yet is frequently deciphered conflictingly. A significant part of the advancement has been made in the previous decade, with numerous urban areas around the globe conveying innovations, for example, traffic the board. Be that as it may, while advancements in data the executives are integral to the city's change, no concurred systems can survey the advancement of the city's scaling back corresponding to data the board. In this paper, we survey how data the executives add to city change and recommend a system for partners and city organizers to use in arranging and actualizing city advancements and estimating progress and for analysts to utilize the improvement of their reasonable structures. We likewise consider the decisions looked by those answerable for or engaged with smoothing out the city, regarding plans of action and the centralization or decentralized data the board activities. The majority of the city's smoothing out tasks include the change of existing biological systems, specifically, urban communities, transport, and different other city credits, particularly with the spread of data the executives in the most successive and direct structure, not by the extreme changes, where exercises and players change. As the experience of the city, insight develops, and as innovation advances, more principal possibilities of change are open, with new players arising, existing players changing what they do and when they do and new connections advance among engineers. These advancements will have critical data on the board suggestions.

## II OVERVIEW OF THE PROJECT

In this section, the major features of smart cities and smart buildings are described. The analysis is performed on a literature overview basis. A review of smart building and smart city assessment is also performed.



# Vehicle Sales and Management System in PHP

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**ABSTRACT:**-This is a car and car parts store that has listings of various cars along with their features. It also consists of car parts and accessories. This system allows user to buy car and inventory. System allow user to check various car stats including car engine, mileage, tank capacity and other factors. Credit card payment facility available for car parts. Car booking has other methods for booking and registration and even a test drive registration. The visitor who visits the system must register himself by filling up personal details. After registration user can login to the system with his username and password in order to access the system. User can check various car listing and can view each car features. User can also check features of the car as well as inventory parts. User may select the product and can add the product to shopping cart. User can make payment through credit cards by clicking on credit card payment option. User must register himself for the test drive. Car loan and other car booking facilities available in car buying section. This application is a combination of both sales and inventory management of the car and car parts. User can easily purchase car or car parts by using this system user does not have to come manually to shop to purchase the product. He can view the car and car parts in effective Graphical User Interface. User can view features of each product and can compare the products in order to purchase a better product.

## I INTRODUCTION

In the fast changing world, information technology and information management are going to play an important role. We are living in the computer age during past some year .The computer has gaining popularity. Computer revolution found its way into almost every aspect of human life and living. A computer is admirably suited to handle any information and hence is an information processor that is, it can receive data, perform some basic operations on that data and produces results according to a predetermined program. is a web based application in which the whole records of the passenger in the vehicle would be manage the details about different students which have received the books would be kept. The students would be able to know the books availability status on the basis of proper login which would be provided to them. The management would be able to know the whole library status on a single click and customized reports would be generated.

## II OVERVIEW OF THE PROJECT

Today's world is computer world because most of work is doing with the help of computer. Dependency on computer is behind the few reasons. We cannot easily manage to store large number of data or information single handle. If we will be need some information or data in urgency then we cannot manage in manually these works are very difficult if we cannot use computer.



# Full Online Telephone and DTH Billing System

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**ABSTRACT:-** Pre-paid Recharging System aims to customize the existing pre-paid system offered by a pre-paid card Agent to the requirements of a Bank, say, ICICI and a Service provider, say, Airtel and integrate it in their existing enterprise system. The system will become the base system and foundation of complete wireless commerce framework. The primary audience is the bank and service providers. Ultimately, all members of the Project Team are the intended audience. The product must be a web-based and work as stand-alone product. In practical, our project makes a customer not to venture outside anywhere from his sitting room for recharging the mobile, that is, from his seat itself, he can able to perform recharge applications through a single message. This facility is what we are providing through our project. The product must be platform independent and it must use link to its home page. This software would satisfy the needs of the clients such, by its security aspects and necessary controls that are adopted by the Programmer and save the messages that has been sent over.

## I INTRODUCTION

PRE-PAID RECHARGING MANAGER is a website in which we record the detail of the Recharges of the distributors. In this, there is a login process for the users. By default all features of the website are disabled. User needs to give valid user id and password. Once the users has logged in successfully, they can use the website. After login to the website the user can access the website, they can add and edit, the various information regarding the Recharges.

First a user is authenticated based upon his/her user Id and Password. If authentication succeeds the user is marked as "logged in" and gets the privilege of inserting, deleting, retrieving or updating records. Data of all the recharges is stored in one centralized database. User can easily use this website without any technical knowledge. But user must have knowledge about the machine and application doesn't need any professional to use the website. User can easily access the data, maintain the record of Recharge.

Mobile is one of the very common devices that people have with them. With passing of years, mobile has become a necessity against luxury. As of today's scenario, almost everyone in the metros does have a mobile. With the increase in popularity of mobile phones, many new mobile handset manufacturers and mobile operators have come up and introduced many attractive schemes and offers. With the easy availability of PRE-PAID RECHARGING, most of the people are attracted towards them as the technology grows at a rapid pace, where we switch from traditional commerce to e-commerce; so does our requirements. To save the valuable time of subscribers, many mobile service providers like Vodafone, Airtel, Idea, etc. have come up with a facility of online recharge.

To ease off the process further, many websites have come up with the idea where one could easily go and get a recharge for any kind of mobile at one place, just at the click of a button.

## II. OVERVIEW OF THE PROJECT

### Aims:-

- The aim of this website is to make people convenient for recharge their mobile from anywhere.
- It maintains two levels of users:-
  1. Administrator Level
  2. User Level

### The Website includes:-

- Easily recharge any number
- Safe payment by card and internet banking.
- Maintain record about user recharge.
- View history of last recharges.





# Shopping Mall Management System in PHP

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**ABSTRACT:**-Extensively accepted problem from major shopping mall owners is to win the customers for their venture. Customers have become more informed with internet and mobile technologies. They prefer to achieve convenient and many times online shopping experience. With an online management site, it becomes easy for mall administrators to manage the mall from remote locations. And also, for shop owners to manage their shop's inventory and check their employee details. Today shopping centers are becoming more complex in terms of its size, type and characteristics and this depicts the challenging role the management team faces. It is important for the owner/developer to establish excellent management teams in order to face the challenges.

If shops are providing an online portal where their customers can enjoy easy shopping from anywhere, the shops won't be losing any more customers to the trending online shops such as flip cart or ebay. Since the application is available in the Smartphone it is easily accessible and always available.

## I. INTRODUCTION

This project is a web based shopping system for an existing shop. The project objective is to deliver the online shopping application. Online shopping is the process whereby consumers directly buy goods or services from a seller in real-time, without an intermediary service, over the Internet. It is a form of electronic commerce. This project is an attempt to provide the advantages of online shopping to customers of a real shop. It helps buying the products in the shop anywhere through internet by using an android device. Thus the customer will get the service of online shopping and home delivery from his favorite shop.

Mall management has been identified as an important factor for the success of malls and the retail industry across the world. Till recently, mall management was restricted to facility management by a majority of developers in India, leading to differences in mall management culture. Given the high future supply of malls and increasing competitiveness within the Indian retail market, developers must correctly address these gaps to ensure success. In order to understand mall management, it is mandatory to have an overview of what malls are.

## II. OVERVIEW OF THE PROJECT

- ❖ Introduce mall management in retail industry
- ❖ Explain retail scenario in India
- ❖ Enlist the main types of malls
- ❖ Elucidate growth of retail in India
- ❖ Explain mall space supply demand
- ❖ Describe different types of mall management

# Placement Management System in PHP

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**ABSTRACT:**-The project is aimed at developing an application for the “WEB BASED PLACEMENT MANAGEMENT SYSTEM” of the college. The system is an application that can be accessed and effectively used throughout the organization with proper login enabled. This system can be used as an application for the Placement Officers in the college to manage the student information with regard to placement. Student logging should be able to upload their personal and educational information in the form of a resume. The key feature of this project is that it is one time registration enabled. Our project provides the facility of maintaining the details of the students. It reduces the manual work and consumes less paper work to reduce the time. This project is developed with PHP for frontend and MY SQL for backend. Students logging should be able to upload their information in the form of a CV. Visitors/Company representatives logging in may also access/search any information put up by Students.

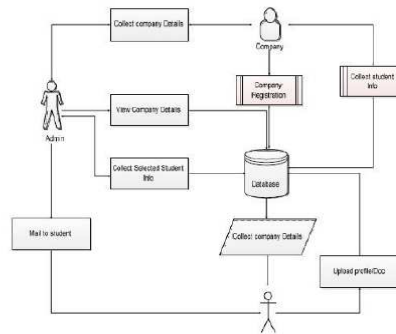
## I. INTRODUCTION

This project is aimed at developing an online application for the Training and Placement Department of the college. The system is an online application that can be accessed throughout the organization and outside as well with proper login provided. This system can be used as an application for the TPO of the college to manage the student information with regards to placement. Students logging should be able to upload their information in the form of a CV. Visitors/Company representatives logging in may also access/search any information put up by Students.

For the purpose of training and placement of the student in colleges, TPO's have to collect the information and CV's of students and manages them manually and arranges them according to various streams. If any modification is required that is to be also done manually. So, to reduce the job required to manage CV's and the information of various recruiters, a new system is proposed which is processed through computers.

## II. OVERVIEW OF THE PROJECT

The project covers a wide scope. The information of all the students can be stored. CV's are categorized according to various streams. Various companies can access the information. Students can maintain their information and can update it. Notifications are sent to students about the companies. Students can access previous information about placement.



System Architecture



# E-Banking App to Manage Accounts and Transfer

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**ABSTRACT:**The project title is “Bank App” the system interface is targeted to the future banking solution for the users who is having multiple bank accounts in banks or who is having so many transactions with the banking system. This interface integrates all bank operations and provides business solutions for both retail and corporate. Bank App system is an innovative web application. The main focus of the application is managing the bank transactions as simple. A person can have bank account in any of the bank. But it’s hard to remember the options of every bank’s operating system. So we have developed a web application where a person can handle all his bank transactions in a secure manner with the user friendly application.

## I. INTRODUCTION

The objective of this application to make the Customers of various Banks can do their account accessibility and transactions using this solution. They need not to interact with various applications or web sites of each bank. The Admin will add new Bank details and can update the existing details of the bank. The Admin will accept/reject the registration of a Customer to use this application. The Bank Admin makes access this site to see the all Customer transactions, account Transfer status, etc. He/she can accept or reject the fund transfer of the Customer. Should able to provide Response for the queries related to the Customers.

The Customers should make request for multiple bank account access to the Administrator. He/she can view the Account related information. The customer should able to transfer the amount from one bank to another bank account using this system by providing the Secondary authentication details. The customer also facilitated to generate report for own bank details for a respective period. The Customer should able to send Queries to the Bank Admin.

## II. OVERVIEW OF THE PROJECT

This system enables user friendly for Bank-Customer relationship. Customer can easily maintain the multiple bank accounts. Then bank provide update details about customer.

The project objective is to create an application that uses customer multi banking system. A person can have bank account in any number of banks. But it’s hard to remember every bank logins. So we have developed a web application where a person can handle all his bank accounts in a secure manner.





# Asset Tracking and Property Management System

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**ABSTRACT:**-Real Estate is the business of buying, selling, and renting land, buildings, and offices. Every person wants his house should be best in a location with all facilities. Offices should be near to market and product unit near to raw material and market place. General companies concentrate on its product and infrastructure are bought from Real Estate Company. Due to competition in this industry, every real estate company wants to deliver the best service and makes its customer satisfied. Online Property Management System is software which takes care of everything that a real estate company wants to do. Property Management System is developed for real estate Companies. It is very strong and easy to use that makes quick booking and account handling process. The real estate Property management system is web-based software and you can access it from anywhere. This ensures the service to client 24X7. Clients can view and book their favorite property online just after few clicks. They can also pay the money online and get bills online.

## I INTRODUCTION

Real Estate Script the best solution for your real estate. It gives the big opportunity of being reached by thousands of people-all possible Clients-looking for real estate. No coding knowledge required! It can be managed by a single person with or without technical experience reducing the costs of maintenance.

## II OVERVIEW OF THE PROJECT

### 1. Administrator:

- In Admin Module Administrator are the user who manages the whole system and all users of this website.
- Admin has the database control.
- Admin has all rights to select, insert, update and delete of all data.
- Admin has also activated and deactivates the user and their properties.

### 2. Agent/Client:

- In the Client section user can buy or sell Property.
- This system also provides the central login facility. • Buyer can create his profile and add property details.
- Seller can search and sell their property.
- Client can also post his requirement. . Both (Seller/Buyer) are messaging with each other through the email.

## Kidney Stone Detection using MRI

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**ABSTRACT:** Currently, kidney stone and tumor removal can be done without surgery. For this purpose, it is required imaging modalities that able to visualize kidney accurately. In order to improve the accuracy of kidney visualization in a short time, an automatic kidney centroid detection is required. This project developed a software to automatically detect the centroid of human kidney. The software was developed using MATLAB with smoothing filter, texture filter and morphological operators. They were used for image segmentation in order to extract important features. Test result shows the software achieve until 96.43% of accuracy in detecting the centroid. The detected centroid can be used as initial point to create ellipse model, which can be used to detect kidney's contour in further research. This software can be implemented in the most US machine that will be used as segmentation tool to reduce human errors and time. Then texture analysis was performed by calculating the local entropy of the image, continued with the threshold selection, morphological operations, object windowing, determination of seed point and ROI generation. This method was performed to several kidney ultrasound images with different speckle noise reduction techniques and different threshold value selection. Based on the result, it shows that for median filter, threshold value of 0.6 gave the highest TRUE ROIs which were 70%. For Wiener filter, threshold value of 0.8 gave highest TRUE ROIs which were 80% and for Gaussian low-pass filter, threshold value of 0.7 gave highest TRUE ROIs which were 100%. By using the previous methods result, this method has been tested also to more than 200 kidney stone ultrasound images.

### I. INTRODUCTION

Nowadays, kidney stone has become a major problem and if not detected at an early stage then it may cause complications and sometimes surgery is also needed to remove the stone. So, to detect the stone and that too precisely paves the way to image processing because through image processing there is a tendency to get the precise results and it is an automatic method of detecting the stone. Doctor generally uses the manual method to detect the stone from the Computed Tomography image but our technique is fully automated so it is advantageous as the time is reduced and with that the chances of error also reduces.

Kidney stone disease is one of the major life threatening ailments persisting worldwide. The stone diseases remain unnoticed in the initial stage, which in turn damages the kidney as they develop. A majority of people are affected by kidney failure due to diabetes mellitus, hypertension, glomerulonephritis, and so forth. Since kidney malfunctioning can be menacing, diagnosis of the problem in the initial stages is advisable. Ultrasound (US) image is one of the currently available methods with noninvasive low cost and widely used imaging techniques for analyzing kidney diseases [1]. Shock wave lithotripsy (SWL), percutaneous nephrolithotomy (PCNL), and relative super saturation (RSS) are the available practices to test urine. The Robertson Risk Factor Algorithms (RRFA) are open and are used for laparoscopic surgery; these algorithms are assigned for exceptional [2] special cases. Hyaluronan is a large (>106 Da) linear glycosaminoglycan composed of repeating units of glucuronic acid (GlcUA) and N-acetyl glucosamine (GlcNAc) disaccharides [3]. It has a significant role in a number of processes that can eventually lead to renal stone disease, including urine concentration, uric acid, salt form crystal, crystallization inhibition, crystal retention, magnesium ammonium phosphate, and amino acid.

### II. LITERATURE SURVEY

#### A REVIEW OF SEGMENTATION METHODS IN SHORT AXIS CARDIAC MR IMAGES

This paper is a review of fully and semi-automated methods performing segmentation in short axis images using a cardiac cine MRI sequence. We will review automatic and semi-automatic segmentation methods of cine MR images of the cardiac ventricles, using the short-axis view. The wide variety of image-driven approaches using weak or no prior have been proposed to tackle the ventricle segmentation in cardiac MRI. Almost all of these methods require either minimal or great user intervention. If image based and pixel classification-based approaches offer a limited framework for incorporating strong prior, straightforward extensions of deformable models in this sense have been extensively

# Hybrid Clustering Technique Based Segmentation of Brain Tumor

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**ABSTRACT:** Inference of tumor and edema areas from brain magnetic resonance imaging (MRI) data remains challenging owing to the complex structure of brain tumors, blurred boundaries, and external factors such as noise. To alleviate noise sensitivity and improve the stability of segmentation, an effective hybrid clustering algorithm combined with morphological operations is proposed for segmenting brain tumors in this paper. The main contributions of the paper are as follows: firstly, adaptive Wiener filtering is utilized for denoising, and morphological operations are used for removing nonbrain tissue, effectively reducing the method's sensitivity to noise. Secondly, K-means++ clustering is combined with the Gaussian kernel-based fuzzy C-means algorithm to segment images. This clustering not only improves the algorithm's stability, but also reduces the sensitivity of clustering parameters. Finally, the extracted tumor images are postprocessed using morphological operations and median filtering to obtain accurate representations of brain tumors. In addition, the proposed algorithm was compared with other current segmentation algorithms. The results show that the proposed algorithm performs better in terms of accuracy, sensitivity, specificity, and recall.

## I. INTRODUCTION

Magnetic Resonance Images (MRI) acquisition provides different sequences like T1- Weighted Images (T1WI), T2-Weighted (T2WI), Proton Density Images (PDI), FluidAttenuated Inversion Recovery (FLAIR) etc. Massive information on tissue structure and pathology can be extracted from these sequences, but each sequence differs in available information content [1]. Slice by slice examination and extraction of small details and abnormalities from these large numbers of sequences is a tedious job in clinical applications. Multispectral data analysis combines the slices of the same brain portion from each sequence to form a single suite so that it helps to analyze the corresponding pixel information as a pixel signature [1]. For example, see the sample slices of T1WI, T2WI and Diffusion Weighted Image (DWI) shown in Figure 1. It is observed that details present in an image vary from slice to slice. In Figure 1, T1WI shows White Matter (WM) information clearly, whereas T2WI contains Gray Matter (GM) and Cerebro Spinal Fluid (CSF) information. DWI fails to distinguish the brain tissues, but pathological information is clearly visible in it.

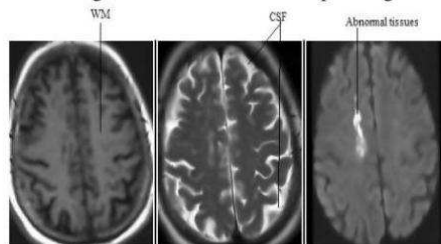


Figure 1. Input Slices of T1WI, T2WI and DWI (from left to right)

Researchers in MRI analysis have been intensively working for last few decades to improve the performance of existing data mining techniques using multispectral approaches. But it remains as a challenge because classification accuracy highly depends upon the input data characteristics and feature analysis methods. Pre-processing, feature extraction and classification are the main steps involved in a typical multispectral analysis system. Preprocessing techniques like image registration, denoising and contrast improvement can contribute much to select the best features





## To Predict the Brightness of Terrain & Cloud Pixels in Remote Sensing Image

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**ABSTRACT:** Next-generation orbital imaging spectrometers will generate unprecedented data volumes, demanding new methods to optimize storage and communication resources. Here, we demonstrate that onboard analysis can excise cloud-contaminated scenes, reducing data volumes while preserving science return. We calculate optimal cloud-screening parameters in advance, exploiting stable radiometric calibration and foreknowledge of illumination and viewing geometry. Channel thresholds expressed in raw instrument values can be then uploaded to the sensor where they execute in real time at gigabit-per-second (Gb/s) data rates. We present a decision theoretic method for setting these instrument parameters and characterize performance using a continuous three-year image archive from the “classic” Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-C). We then simulate the system onboard the International Space Station, where it provides factor-of-two improvements in data volume with negligible false positives. Finally, we describe a real-time demonstration onboard the AVIRIS Next Generation (AVIRIS-NG) flight platform during a recent science campaign. In this blind test, cloud screening is performed without error while keeping pace with instrument data rates.

### I. INTRODUCTION

The detection of clouds in satellite imagery has a number of important applications in weather and climate studies. The presence of clouds can alter the energy budget of the Earth-atmosphere system through scattering and absorption of shortwave radiation and the absorption and re-emission of infrared radiation. The scattering and absorption characteristics of clouds vary with the microphysical properties of clouds, hence the cloud type. Thus, detecting the presence of clouds over a region in satellite imagery is important in order to derive atmospheric (e.g., optical depth, phase, temperature, etc.) that give insight into weather and climate processes. For many applications however, clouds are a contaminant whose presence interferes with retrieving atmosphere or surface information. In these cases, the detection of cloud contaminated pixels in satellite imagery is important to isolate cloud-free pixels used to retrieve atmospheric thermodynamic information (e.g., temperature and moisture information, ozone content, and even trace gas concentrations) or surface geophysical parameters (e.g., land and sea surface temperature, vegetation information, etc.) from cloudy ones.

The ability to derive an accurate cloud mask from geostationary and polar orbiting satellite data under a variety of conditions has been a research topic since the launch of the first Earth observing satellite TIROS-1 in 1960. The limited success of some early studies (Coakley and Bretherton 1982, Rossow and Garder 1993, and those discussed by Goodman and Sellers 1988) suggests that the accurate detection of clouds in satellite imagery both during the day and at night is a challenging problem. In more recent work, the probability of detecting clouds has been reported to exceed 90% (Saunders and Kriebel 1988, Merchant et al. 2005, Jedlovec et al. 2008, Reuter et al. 2009) but the performance varies seasonally, regionally, with time of day and retrieval technique. While traditionally both spatial and spectral techniques have been employed to identify cloud contaminated pixels in polar orbiting and geostationary satellite data, sensor spatial resolution, the lack of surface – atmospheric boundary layer temperature contrast, and surface emissivity variations all present performance challenges to a given cloud detection approach. Thus, any one technique may not be best suited for all applications, but may perform quite well in a particular environment (usually the environment in which the algorithm was developed and tested). The key to the success of most of these algorithms lies in the selection of the thresholds for various spectral tests. In more robust algorithms, spatially and temporally varying thresholds, which better capture local atmospheric and surface effects, are used to improve their performance and broaden their application over algorithms with fixed thresholds for cloud tests.

In this chapter, a review of several multispectral cloud detection techniques is presented. Emphasis is placed on techniques which use multispectral approaches applicable to a wide variety of current and future satellite sensors.

# Text Detection and Recognition from Natural Scene

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**ABSTRACT:** Many techniques and algorithm have been developed to solve the problem of text extracted from natural scenes. Text extraction is emerging and challenging era in the computer vision. Text which is embedded into the image contains semantic information which is used in many other applications such as information retrieval of complex images, robot navigation, useful for visually impaired persons, street signs, automatic read the sign board and use in so many other applications. Most of the research work in this area has been done only on printed text, a very few research is addressing the LED scene text. Scene text is difficult to extract due to blur image, variations in color, noise problem, complex background, discontinuity, poor lighting conditions, and variation in illumination. LED is which is widely used in displaying the information in boards. Now days LED display that is natural scene is being widely used for displaying announcements, sign boards, banners for displaying information. To extract the text from the LED display is not an easy task, it is very complex due to its discontinuity. So, the aim of this paper to propose a technique to extract the two type of LED text from natural scene image. The first step of the algorithm is preprocessing of the image where the image is converted from RGB to grayscale, noise is removed and the image is converted to binary image, etc. Then the text is localized. After that connected component approach is used for text detection and finally the text has been recognized using template matching with correlation. The experimental results of the proposed method show the detection and recognition rate is 82.87 and 57.6.

## I. INTRODUCTION

In electrical engineering and computer science, image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it. Image processing usually refers to digital image processing, but optical and analog image processing also are possible. This article is about general techniques that apply to all of them. The acquisition of images (producing the input image in the first place) is referred to as imaging. With the increasing use of digital image capturing devices, such as digital cameras, mobile phones and PDAs, content-based image analysis techniques are receiving intensive attention in recent years. Among all the contents in images, text information has inspired great interests, since it can be easily understood by both human and computer, and finds wide applications such as license plate reading, sign detection and translation, mobile text recognition, content-based web image search. This paper presents a real application to intelligent transportation systems (ITS) of a method to detect and recognize text in images taken from natural scenarios proposed by the same authors. This text reading algorithm has proved to be robust in many kinds of real-world scenarios, including indoor and outdoor places with a wide variety of text appearance due to different writing styles, fonts, colors, sizes, textures and layouts, as well as the presence of geometrical distortions, partial occlusions, and different shooting angles that may cause deformed text.

In this paper, this algorithm is applied, including some modifications and new functionalities, to read the information contained in traffic panels using the images served by Google Street View. The aim of this work is, in the first place, to detect traffic panels and to recognize the information inside them, showing that the text detection and recognition method proposed in [1] can be generalized to other scenarios, which are completely different to those that have been tested, without needing to retrain the system. In the second place, we want to develop an application that enables the creation of up-to-date inventories of traffic panels of regions or countries that facilitate traffic signposting maintenance and driver assistance. In this paper, we focus on traffic panels in the Spanish territory for two main reasons. First, unlike other countries, the coverage of Street View in Spain is near complete; thus, we can create a huge and diverse data set of images. Second, as far as we know, there is not any official database of all the traffic panels in Spain; thus,



# A Smart Phone Image Processing Application for Plant Disease Diagnosis

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**ABSTRACT:** Agricultural productivity is that issue on that Indian Economy extremely depends. this is often the one in all the explanations that malady detection in plants plays a very important role in the agriculture field, as having the malady in plants are quite natural. If correct care isn't taken during this space then it causes serious effects on plants and because of that various product quality, amount or productivity is affected. Detection of disease through some automatic technique is helpful because it reduces an oversized work of watching in huge farms of crops, and at terribly early stage itself it detects the symptoms of diseases means that after they seem on plant leaves. This paper presents a neural network algorithmic program for image segmentation technique used for automatic detection still as the classification of plants and survey on completely different diseases classification techniques that may be used for plant leaf disease detection. Image segmentation, that is a very important facet for malady detection in plant disease, is completed by victimization genetic algorithmic program

## I. INTRODUCTION

Image Definition Image is a collection of pixels or dots which are stored in rectangular array. Each individual pixel is having certain kind of color. We can measure the size of the image by counting the no of pixels in that particular image. Different types of images are there such as Black and White and Grey scale images. Both types vary from each other. In black and white image each dot or pixel is either black or white, therefore only one bit is needed per pixel. Whereas Grey scale images uses 8 bits per pixel. For color images things gets slightly difficult. In color images number of bits at every dot termed as the height of image. It is also referred as the bit plane. For bit plane consisting of x, 2x color are possible. Different methods are available to store the color information of image. One of the method is RGB image also termed as true color image. For every pixel red, green and blue component is stored in three dimensional arrays.

### Identifying Patterns

In order to detect the same kind of pattern different pattern recognition techniques are used in MATLAB. Using these techniques we recognize the similar kind of the pattern in the problem. When same kind of pattern are detected then these can be used to generate outputs or solve the problems more efficiently. In order to recognize the pattern, we need to train the machine. For this first we need to classify the data. The data is classified using the key features. For classifying the data we have different type of learning modules is there such as supervised learning and unsupervised learning modules. Both of these modules are used to identify the patterns. In supervised learning module we train the machine by recognizing the patterns in the data set and then results which are generated are applied to the testing data set. We train the machine over the training dataset and test it over the testing data set. In unsupervised learning module, there are no visible pattern the dataset, so with the help of the some algorithm we try to catch the patterns. Clustering algorithm, classification algorithm such as Markov Model (MM) is there. For recognizing the patterns we identify we have different techniques such as preprocessing, Extraction of features and classification. In preprocessing we try to filter out, smooth the data by normalizing in more ordered way. Filtering such as noise filtering is there. Feature extraction is usually done using the software which collect the information from the data. Sensors are also used for this purpose and the final phase is the classification.



# Real Time Vehicle Security System through Number Plate and Fingerprint Recognition

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**ABSTRACT:** The use of vehicle is a must for everyone. In the same way, safeguarding the vehicle against theft is also very essential. Impediment of vehicle theft can be done remotely by an authorized person. A competent automotive security system is implemented using Number plate recognition and Fingerprint Recognition. The NPR (Number Plate Recognition) technique in a system design helps in recognition of number plate of vehicles. This system is based on the image processing technique. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate and fingerprint recognition. The system is implemented on the entrance of a company parking area for security control. The developed system first captures the vehicle image. Vehicle number plate region is extracted using the image segmentation. Several techniques are used for Number recognition. The system is implemented and simulated in Matlab. There are two types of fingerprint systems: fingerprint verification and identification. We are going to use fingerprint verification system. Fingerprint verification is the process of accepting and rejecting the identity claim of a person using his/her fingerprint. If the fingerprint does not matches the one which is stored in the database means an alert message is sent to the security. This makes security for vehicle from unauthorized user.

## I. INTRODUCTION

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. In imaging science, image processing is processing of images using mathematical operations by using any form of signal processing for which the input is an image, such as a photograph or video frame. The common steps in image processing are image scanning, storing, enhancing and interpretation. In this modern age there is rapid increase in number of vehicles and so Is the number of vehicle theft attempts, locally and internationally? With the invention of strong stealing techniques, security are in fear of having their vehicles being stolen from common parking area or from outside their home. Thus the protection of vehicles from theft becomes important due to insecure environment. Real time vehicle security system based on computer vision provides a solution to this problem. The proposed vehicle security system performs image processing based real time user authentication using fingerprint as well as number plate recognition techniques. The use of vehicle becomes important everywhere in the world and also preventing it from theft is required. Vehicle manufacturers are attaining the security features of their products by introducing advanced automated technologies to avoid the thefts particularly in case of vehicles.

In the proposed vehicle security system, the objective is to prevent the theft of vehicle using fingerprint

### Number Plate Identification:

Number plates are used for identification of vehicles all over the nations. Vehicles are identifying either manually or automatically. Automatic vehicle identification is an image processing technique of identify vehicles by their number plates. Automatic vehicle identification systems are used for the purpose of effective traffic control and security applications such as access control to restricted areas and tracking of wanted vehicles. Number plate recognition (NPR) is easier method for Vehicle identification. NPR system for Indian license plate is difficult compared to the foreign license plate as there is no standard followed for the aspect ratio of license plate.

The identification task is challenging because of the nature of the light. Experimentation of number plate detection has been conducted from many years, it is still a challenging task. Number plate detection system investigates an input image to identify some local patches containing license plates. Since a plate can exist anywhere in an image with various sizes, it is infeasible to check every pixel of the image to locate it. In parking, number plates are used to calculate duration of the parking. When a vehicle enters an input gate, number plate is automatically recognized and

# Plant Identification Using Leaf Images

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**ABSTRACT:** This paper presents a computer based automatic plant identification system. Out of all available organs of plant, leaf is selected to obtain the features of plant. Five geometrical parameters are calculated using digital image processing techniques. On the basis of these geometrical parameters six basic morphological features are extracted. Vein feature as a derived feature is extracted based on leaf structure. At the first stage leaf images are obtained using digital scanner. Then above mentioned morphological features are extracted which act as input to the classification stage. Recognition accuracy of the proposed algorithm is tested. Accuracy of this algorithm is tested on two different databases and compared. False acceptance ratio and false rejection ratio for both databases is calculated. Total 12 kinds of plants are classified using this algorithm. Dataset consists of 92 images of total 12 plants. This method implements effective algorithm used for plant identification and classification as it is independent of leaf maturity. Proposed method is easy to implement and fast in execution.

## I. INTRODUCTION

Plants are important part of our ecosystem. There is huge number of plants existing in nature. Many of them are at the risk of extinction. So it is very necessary to catalogue their identity, features and useful properties. Also there are many medicinal plants which play an important role in Ayurveda. Now a day, whole world is facing various problems like global warming, biodiversity loss, effects of fast urban development, and various environmental damages. Hence there is an urgent need to apply advanced computer vision techniques to obtain the botanical knowledge like plant taxonomy, various features of plant and make this information accessible and useful to different kinds of people like researchers, farmers, botanists, and students [1].

Hence plant identification is the first and important task. There are many plant organs like leaves, flowers, fruits, seeds which can be used for plant identification. In this paper leaves are selected to obtain the features of plant. Because leaf can be easily obtained and scanned and also it consists of more excluding information which is useful for plant classification. These leaf images are sent to computer and then by using image processing tools, leaf features are extracted to identify the plant. Several methods have been introduced for plant identification.

Many of them have selected leaf as characterizing organ. Some of them used shape description method while other deal with colour feature, texture features, vein structure, geometrical features etc. [2]. B.Wang et al. [3] propose shape descriptor method for online plant leaf identification working on mobile platform. They measured the convexity and concavity property of the arches of various levels and obtained the multilevel shape descriptor. S.G.Wu et al. [4] extracted 12 leaf features and orthogonalized them into 5 principal variables using Principal Component Analysis (PCA) and Probabilistic Neural Network (PNN) as a classifier.

To recognize the plant species J. Chaki et al. used Gabor Filter. Convolving Gabor filter with leaf images, real and imaginary parts of resultant signal are obtained [5]. Absolute difference between them is calculated which is used as feature value. In this paper leaf identification algorithm is implemented by extracting the leaf features. Five geometrical parameters of each leaf image are calculated. Using these geometrical parameters six basic features is obtained. One derived feature which is vein feature is extracted. This paper uses Euclidean classifier to classify the leaf images. Advantage of using Euclidean classifier is that it is fast and easy to implement.

Plants are essential for mankind. In particular, herbs have been used as folk medicines by indigenous people since ancient times. Herbs are usually identified by practitioners based on years of experiences through personal sensory or olfactory sense [1]. Recent advances in analytical technology have significantly assisted in herbal recognition based on scientific data. This eases many people, especially those that are lacking experience in herbal recognition. Laboratory-based testing requires skills in sample treatment and data interpretation, in addition to time consuming procedures [2]. Therefore, a simple and reliable technique for herbal recognition is needed. Computation combined with statistical analysis is likely to be a powerful tool for herbal recognition. This nondestructive technique



# Iris Recognition- Image Processing

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**ABSTRACT:** Biometrics systems have significantly improved person identification and authentication, playing an important role in personal, national, and global security. Iris segmentation algorithms are of great significance in complete iris recognition systems, and directly affect the iris revivification and recognition results. However, the conventional iris segmentation algorithms have poor adaptability and are not sufficiently robust when applied to noisy iris databases captured under unconstrained conditions. In addition, there are currently no large iris databases; thus, their is segmentation algorithms cannot maximize the benefits of convolutional neural networks (CNNs). The main work of this paper is as follows: first, we propose an architecture based on CNNs combined with dense blocks for iris segmentation, referred to as a dense-fully convolution network (DFCN), and adopt some popular optimizer methods, such as batch normalization (BN) and dropout. Second, because the public ground-truth masks of the CASIA-Interval-v4 and IITD iris databases do not include the labeled eyelash regions, we label these regions that occlude the iris regions using the Label me software package. Finally, the promising results of experiments based on the CASIA-Interval-v4, IITD, and UBIRIS.V2 iris databases captured under different conditions reveal that the iris segmentation network proposed in this paper outperforms all of the conventional and most of the CNN-based iris segmentation algorithms with which we compared our algorithm's results in terms of various metrics, including the accuracy, precision, recall, f1 score, and nice1 and nice2 error scores, reflecting the robustness of our proposed network. The results strongly indicate that spoofing detection systems based on convolution networks can be robust to attacks already known and possibly adapted, with little effort, to image-based attacks that are yet to come.

## I. INTRODUCTION

Iris texture plays an important role in national defense and security because of its unique, stable, noncontact and anticounterfeiting characteristics. A complete iris recognition system usually consists of the following steps: initially, iris images are obtained by an imaging device. Then, the iris regions of the eye images are located by iris segmentation algorithms. Next, iris features are extracted by feature extraction algorithms. Finally, the extracted iris features are used for iris verification or recognition. As shown in FIGURE 1, with the exception of the iris regions, the iris images consist of not only the iris regions but also other regions, i.e., pupil, eyelid, eyelashes and sclera [1]. The non-iris regions degrade the iris segmentation performance. Iris segmentation algorithms are designed to eliminate the effects of the non-iris regions and accurately segment the iris regions from the eye images. The associate editor coordinating the review of this manuscript and approving it for publication was Genny Tortora. The eye images. Iris segmentation algorithms are of great significance in iris recognition systems. The accuracy and robustness of the algorithms directly affect the subsequent iris extraction, verification and recognition stages [2]. Under ideal conditions—i.e., the iris regions are not occluded by the eyelids or eyelashes, the iris images are clear, and users are absolutely cooperative; thus, most existing iris segmentation algorithms can accurately segment the iris regions. However, under non ideal conditions, it is still challenging to design robust iris segmentation algorithms that accurately segment the iris regions despite the effects of eyelids, eyelashes, light, and user cooperation.

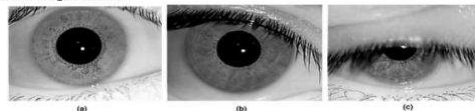


FIGURE 1. Samples of iris images under ideal and nonideal conditions. (a) Ideal iris images. (b) Iris images slightly occluded. (c) Iris images severely occluded

### Deep Learning

In this paper, we do not focus on custom-tailored solutions. Instead, inspired by the recent success of Deep Learning in several vision tasks, and by the ability of the technique to leverage data, we focus on two general-purpose approaches



# Comments on Steganography using Reversible Texture Synthesis

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**ABSTRACT:** Internet is gaining more and more popular now a days, so there is need to provide security for everything on internet. One of the most important concepts where we need to provide higher security is in communication between sender and receiver. Due to security threats the requirement of the secure transmission of the data is also increased the reason for developing the Data Hiding is the easy access of images, documents confidential data by the hackers who always monitor the system. Data hiding is the process of secretly embedding information inside a source without changing its content and meaning there is numerous techniques which hides the data. This paper aims to implement data hiding in compressed video. Like data hiding in images and raw video which operates on the images themselves in the spatial or transformed domain which are vulnerable to steganalysis. The sender first uses the steganographic application for encrypting the secret message. For this encryption, the sender uses text document in which the data is written and the image as a carrier file in which the secret message or text document to be hidden. The sender sends the carrier file and text document to the encryption phase for data embedding, in which the text document is embedded into the image file. In encryption phase, the data is embedded into carrier file which was protected with the password now the carrier file acts as an input for the decryption phase. The image in which data is hidden i.e. the carrier file is sent to the receiver using a transmission medium. E.g. Web or e-mail. The receiver receives the carrier file and places the image in the decryption phase. Now the carrier file acts as an input for the decryption phase. The image in which data is hidden the carrier image is sent to the receiver using a transmission medium. E.g. Web or e-mail. The receiver receives the carrier file and places the image in the decryption phase.

## I. INTRODUCTION

### 1.1 INTRODUCTION TO IMAGE PROCESSING

In imaging science, image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it.

Image processing usually refers to digital image processing, but optical and analog image processing also are possible. This article is about general techniques that apply to all of them. The acquisition of images (producing the input image in the first place) is referred to as imaging.

Closely related to image processing are computer graphics and computer vision. In computer graphics, images are manually made from physical models of objects, environments, and lighting, instead of being acquired (via imaging devices such as cameras) from natural scenes, as in most animated movies. Computer vision, on the other hand, is often considered high-level image processing out of which a machine/computer/software intends to decipher the physical contents of an image or a sequence of images (e.g., videos or 3D full-body magnetic resonance scans).

In modern sciences and technologies, images also gain much broader scopes due to the ever growing importance of scientific visualization (of often large-scale complex scientific/experimental data). Examples include microarray data in genetic research, or real-time multi-asset portfolio trading in finance.

### 1.2 DATA HIDING

In first we have addressed a few fundamental issues of data hiding in image and video. We have proposed general solutions, including how to embed multiple bits, how to handle uneven embedding capacity, and how to allow the number of reliably extractable bits to be adaptable to the actual noise condition. Here apply the solutions to specific design problems and present details of embedding data in image and video. In Section II, we embed data in images at two levels, each of which is designed for different robustness. This approach allows for graceful decaying of extractable information as noise gets stronger. In extend the multilevel embedding to video, for which difficulty arises

# Implementing Novel Cryptography Technique in Image Encryption and Secure Data Hiding

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**ABSTRACT:**Reversible data hiding technique in encrypted secret image and hiding the original image. The pixels of the image and a special encryption scheme are designed to encrypt the estimating errors. Without the encryption key, one cannot get access to the original image. The data hiding key only, it can embed in or extract from the encrypted image additional data without knowledge about the original image. The data extraction and image recovery are free of errors for all images. Experiments demonstrate the feasibility and efficiency of the proposed method. A bench- mark encryption algorithm (e.g. AES) is applied to the rest pixels of the image and a special encryption scheme is designed to encrypt the estimating errors. Without the encryption key, one cannot get access to the original image. However, provided with the data hiding key only, he can embed in or extract from the encrypted image additional data without knowledge about the original image. Moreover, the data extraction and image recovery are free of errors for all images. Experiments demonstrate the feasibility and efficiency of the proposed method, especially in aspect of embedding rate versus Peak Signal-to-Noise Ratio (PSNR). And also used LSB the least significant bit (lsb) is the bit position in a binary integer giving the units value, that is, determining whether the number is even or odd. The lsb is sometimes referred to as the right-most bit, due to the convention in positional notation of writing less significant digit further to the right.

## 1. INTRODUCTION

Reversible data hiding (RDH) has the capability to erase the distortion introduced by embedding step after cover restoration. It is an important property that can be applied to many scenarios, such as medical imagery, military imagery and law for entices. For this reason, RDH becomes a hot research topic and is extensively studied over the years. Until now, many RDH techniques have been proposed based on three fundamental strategies: lossless compression- appending scheme [difference expansion (DE) and histogram shift (HS)]. Some recent arts combined the three strategies to residuals of the image such as prediction errors (PE) to achieve better performance. Almost all state-of- the-art RDH algorithms consist of two steps. Generates a host sequence with small entropy, i.e., the host has a sharp histogram which usually can be realized by using PE combined with the sorting technique or pixel selection. The second step reversibly embeds the message in the host sequence by modifying its histogram with methods like HS and DE. On the other hand, some robust RDH methods have also been proposed. Least significant bit (LSB) technique has been proposed. HLSB technique where the secret information is embedded in the LSB of the cover frame. Hash function is used to select the position of insertion in LSB bits. In this technique has been used mean square error (MSE).

Its h help to error required in original image. The proposed technique is compared with existing LSB based secret message and the results are found to be encouraging. Level of information increased and LSB maintain the separate key. We can easily clear the secret image, so we can get in original image. Reversible data hiding in images is a technique that hides data in digital images for secret communication. It is a technique to hide additional message into cover media with a reversible manner so that the original cover content can be perfectly restored after extraction of the hidden message. In this paper has been used image encrypted and decrypted method. Encryption is an effective and popular means of privacy protection. In order to securely share a secret image with other person, a content owner may encrypt the image before transmission. "Selective encryption". Secure multimedia distribution one part the data is encrypted.

There are two levels of security for digital image encryption: low level and high-level security encryption. In low-level security encryption, the encrypted image has degraded visual quality compared to that of the original one, but the content of the image is still visible and understandable to the viewers. In the high-level security case, the content is completely scrambled and the image just looks like random noise.



# Content Based Image Retrieval Based on Color and Texture Features

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**ABSTRACT:** In this paper, the algorithm for a novel image retrieval scheme to retrieve images is presented. We address the unique algorithm to extract the colour pixel features by the HSV colour space and the texture features of Mpeg-7 Edge Histogram Descriptor. The proposed scheme transfers each image to a quantized colour code using the regulations of the properties in compliance with HSV model and subsequently using the quantized colour code along with the texture feature of Edge Histogram Descriptor to compare the images of database. We succeed in transferring the image retrieval problem to quantized code comparison. Experimenting on two public datasets, the results show that the proposed methods can achieve up to 43.5% relative improvement in MAP compared to the existing methods. We will use lab feature extraction for to detect the color and to identify the texture using multi dimensional texture analysis then the edge orientation histogram is used for shape detection. We propose two orthogonal methods named attribute-enhanced sparse coding and attribute-embedded inverted indexing. Attribute-enhanced sparse coding exploits the global structure of feature space and uses several important human attributes combined with low-level features to construct semantic code words in the offline stage.

## I. INTERODUCTION

MANY former schemes have been developed to improve the retrieval accuracy in the content-based image retrieval (CBIR) system. One type of them is to employ image features derived from the compressed data stream. As opposite to the classical approach that extracts an image descriptor from the original image, this retrieval scheme directly generates image features from the compressed stream without first performing the decoding process. This type of retrieval aims to reduce the time computation for feature extraction/generation since most of the multimedia images are already converted to compressed domain before they are recorded in any storage devices. In the image features are directly constructed from the typical block truncation coding (BTC) or halftoning-based BTC compressed data stream without performing the decoding procedure. These image retrieval schemes involve two phases, indexing and searching, to retrieve a set of similar images from the database. The indexing phase extracts the image features from all of the images in the database which is later stored in database as feature vector. In the searching phase, the retrieval system derives the image features from an image submitted by a user (as query image), which are later utilized for performing similarity matching on the feature vectors stored in the data-base. The image retrieval system finally returns a set of images to the user with a specific similarity criterion, such as color similarity and texture similarity. The concept of the BTC [1] is to look for a simple set of representative vectors to replace the original images.

Specifically, the BTC compresses an image into a new domain by dividing the original image into multiple non overlapped image blocks, and each block is then represented with two extreme quantizers (i.e., high and low mean values) and bitmap image. Two subimages constructed by the two quantizers and the corresponding bitmap image are produced at the end of BTC encoding stage, which are later transmitted into the decoder module through the transmitter. To generate the bitmap image, the BTC scheme performs thresholding operation using the mean value of each image block such that a pixel value greater than the mean value is regarded as 1 (white pixel) and vice versa. The traditional BTC method does not improve the image quality or compression ratio compared with JPEG or JPEG 2000. However, the BTC schemes achieves much lower computational complexity compared with that of these techniques. Some attempts have been addressed to improve the BTC reconstructed image quality and compression ratio, and also to reduce the time computation.



# Object based Segmentation using KFCM Technique for Shadow Detection and Removal from Satellite Image

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**ABSTRACT:** Remote sensing image segmentation is the basis of image pattern recognition. It is significant for the application and analysis of remote sensing images. Clustering analysis as a non-supervised learning method is widely used in the segmentation of remote sensing images. It has made good results in the segmentation of low-resolution and moderate-resolution remote sensing images. As the improvement of image resolution, however, they have problems in the segmentation of high-resolution remote sensing images. In this paper we propose a KFCM based high-resolution remote sensing image segmentation algorithm. Furthermore, some dark objects which could be mistaken for shadows are ruled out according to object properties and spatial relationship between objects. For shadow removal, inner-outer outline profile line (IOOPL) matching is used. First, the IOOPLs are obtained with respect to the boundary lines of shadows. Shadow removal is then performed according to the homogeneous sections attained through IOOPL similarity matching. Experiments show that the new method can accurately detect shadows from urban high-resolution remote sensing images and can effectively restore shadows with a rate of over 85%. The segmentation experiments show that the result of this algorithm is better than the existing methods and is close to the results of artificial extraction.

## I. INTRODUCTION

### 1.1 INTRODUCTION TO REMOTE SENSING

Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object and thus in contrast to in situ observation. In modern usage, the term generally refers to the use of aerial sensor technologies to detect and classify objects on Earth (both on the surface, and in the atmosphere and oceans) by means of propagated signals (e.g. electromagnetic radiation). It may be split into active remote sensing (when a signal is first emitted from aircraft or satellites) or passive (e.g. sunlight) when information is merely recorded. Passive sensors gather natural radiation that is emitted or reflected by the object or surrounding areas. Reflected sunlight is the most common source of radiation measured by passive sensors. Examples of passive remote sensors include film photography, infrared, charge-coupled devices, and radiometers. Active collection, on the other hand, emits energy in order to scan objects and areas whereupon a sensor then detects and measures the radiation that is reflected or backscattered from the target. RADAR and LiDAR are examples of active remote sensing where the time delay between emission and return is measured, establishing the location, speed and direction of an object.

#### Illustration of Remote Sensing

Remote sensing makes it possible to collect data on dangerous or inaccessible areas. Remote sensing applications include monitoring deforestation in areas such as the Amazon Basin, glacial features in Arctic and Antarctic regions, and depth sounding of coastal and ocean depths. Military collection during the Cold War made use of stand-off collection of data about dangerous border areas. Remote sensing also replaces costly and slow data collection on the ground, ensuring in the process that areas or objects are not disturbed.

Orbital platforms collect and transmit data from different parts of the electromagnetic spectrum, which in conjunction with larger scale aerial or ground-based sensing and analysis, provides researchers with enough information to monitor trends such as El Niño and other natural long and short term phenomena. Other uses include different areas of the earth sciences such as natural resource management, agricultural fields such as land usage and conservation, and national security and overhead, ground-based and stand-off collection on border areas.

# Deduction of Lung Cancer with Digital Image Processing Over CT Scan Images

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**ABSTRACT:** This study aims to highlight the significance of data analytics and machine learning in prognosis in health sciences, particularly in detecting life threatening and terminal diseases like cancer. Here, we consider lung cancer for our study. For this purpose, preexisting lung cancer patients' data are collected to get the desired results. A predictive algorithm is developed to predict the probability of a patient catching lung cancer based on dataset comes from the Data Science Bowl 2017. Data set (in the form of diagnostic images) is run past Matlab for analysis and forecasting. Image processing is employed for this purpose. Medical image segmentation and classification are done to achieve this. Classification depends on features extracted from the images. The emphasis is on the feature extraction stage to yield better classification performance. Image quality and accuracy is the core factors of this research, image quality assessment as well as improvement are depending on the enhancement stage where low pre-processing techniques is used based on Gabor filter within Gaussian rules. Following the segmentation principles, an enhanced region of the object of interest that is used as a basic foundation of feature extraction is obtained. This information is then fed to machine learning algorithms to discern a pattern that can give some good insights into what combination of features are most likely to result in an abnormality.

## I. INTRODUCTION

Lung cancer is a disease of abnormal cells multiplying and growing into a tumour. Cancer cells can be carried away from the lungs in blood, or lymph fluid that surrounds lung tissue. Lymph flows through lymphatic vessels, which drain into lymph nodes located in the lungs and in the centre of the chest. Lung cancer often spreads toward the centre of the chest because the natural flow of lymph out of the lungs is toward the centre of the chest. Metastasis occurs when a cancer cell leaves the site where it began and moves into a lymph node or to another part of the body through the blood stream [1].

Cancer that starts in the lung is called primary lung cancer. There are several different types of lung cancer, and these are divided into two main groups: Small cell lung cancer and non-small cell lung cancer which has three subtypes: Carcinoma, Adenocarcinoma and Squamous cell carcinomas. The rank order of cancers for both males and females among Jordanians in 2008 indicated that there were 356 cases of lung cancer accounting for (7.7 %) of all newly diagnosed cancer cases in 2008. Lung cancer affected 297 (13.1 %) males and 59 (2.5%) females with a male to female ratio of 5:1 which Lung cancer ranked second among males and 10th among females [2]. Figure 1 shows a general description of lung cancer detection system that contains four basic stages.

The first stage starts with taking a collection of CT images (normal and abnormal) from the available Database from IMBA Home (VIA-ELCAP Public Access) [3]. The second stage applies several techniques of image enhancement, to get best level of quality and clearness. The third stage applies image segmentation algorithms which play an effective rule in image processing stages, and the fourth stage obtains the general features from enhanced segmented image which gives indicators of normality or abnormality of images.

Lung cancer is the most dangerous and widespread cancer in the world according to stage of discovery of the cancer cells in the lungs, so the process early detection of the disease plays a very important and essential role to avoid serious advanced stages to reduce its percentage of distribution. The aim of this research was to detect features for accurate images comparison as pixels percentage and mask-labelling.



# Lossless Image and Video Compression Technique

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**ABSTRACT:** Images are being used in many fields of research. One of the major issues of images is their resolution. In this paper we are studying different image resolution enhancement techniques that use Wavelet Transform (WT). Basis functions of the WT are small waves located in different times. They are obtained using scaling and translation of a scaling function and wavelet function. Therefore, the WT is localized in both time and frequency. In this method is used to improve the image resolution for different type of images. In this paper we are comparing different image resolution enhancement techniques those using Wavelet Transform. The increasing demand to incorporate video data into telecommunication series, the corporate environment the entertainment industry, and even at home as made digital video technology a necessity. A problem however is that still image and digital video data rates are very large typically in the range of 150Mbps/sec. Data rates of this magnitude would consume a lot of the bandwidth, storage and computing resources in the typical personal computer. For this reason Video summarization standards have been developed to eliminate picture redundancy, allowing video information to be transmitted and stored in a compact and efficient manner.

## I. INTRODUCTION

Image resolution enhancement is a usable preprocess for many satellite image processing applications, such as vehicle recognition, bridge recognition, and building recognition to name a few. Image resolution enhancement techniques can be categorized into two major classes according to the domain they are applied in: 1) image-domain; and 2) transform-domain. The techniques in image-domain use the statistical and geometric data directly extracted from the input image itself [1], [2], while transform-domain techniques use transformations such as decimated discrete wavelet transform to achieve the image resolution enhancement [3]–[6].

The decimated discrete wavelet transform (DWT) has been widely used for performing image resolution enhancement [3]–[5]. A common assumption of DWT-based image resolution enhancement is that the low-resolution (LR) image is the low-pass filtered subband of the wavelet-transformed high-resolution (HR) image. This type of approach requires the estimation of wavelet coefficients in subbands containing high-pass spatial frequency information in order to estimate the HR image from the LR image.

In order to estimate the high-pass spatial frequency information, many different approaches have been introduced. In [3], [4], only the high-pass coefficients with significant magnitudes are estimated as the evolution of the wavelet coefficients among the scales. The performance is mainly affected from the fact that the signs of estimated coefficients are copied directly from parent coefficients without any attempt being made to estimate the actual signs. This is contradictory to the fact that there is very little correlation between the signs of the parent coefficients and their descendants. As a result, the signs of the coefficients estimated using extreme evolution techniques cannot be relied upon. Hidden Markov tree (HMT) based method in [5] models the unknown wavelet coefficients as belonging to mixed Gaussian distributions which are symmetrical about the zero mean.

HMT models are used to determine the most probable state for the coefficients to be estimated. The performance also suffers mainly from the sign changes between the scales. The decimated DWT is not shift-invariant and, as a result, suppression of wavelet coefficients introduces artifacts into the image which manifests as ringing in the neighbourhood of discontinuities [6]. In order to combat this drawback in DWT-based image resolution enhancement, cycle-spinning methodology was adopted in [6]. The perceptual and objective quality of the resolution enhanced images by their method compare favorably with recent methods [3], [5] in the field.



# Skin Cancer Detection Using MATLAB

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**ABSTRACT:** Human Cancer is one of the most dangerous disease which is mainly caused by genetic instability of multiple molecular alterations. Among many forms of human cancer, skin cancer is the most common one. To identify skin cancer at an early stage we will study and analyze them through various techniques named as segmentation and feature extraction. Here, we focus malignant melanoma skin cancer, (due to the high concentration of Melanoma- Hier we offer our skin, in the dermis layer of the skin) detection. In this, We used our ABCD rule dermoscopy technology for malignant melanoma skin cancer detection. In this system different step for melanoma skin lesion characterization i.e, first the Image Acquisition Technique, pre-processing, segmentation, define feature for skin Feature Selection determines lesion characterization, classification methods. In the Feature extraction by digital image processing method includes, symmetry detection, Border Detection, color, and diameter detection and also we used LBP for extract the texture based features. Here we proposed the Back Propagation Neural Network to classify the benign or malignant stage.

## I. INTRODUCTION

A collection of abnormal cells in our body is name as cancer. In humans cancer can start anywhere in the body and spread into the surrounding tissues which is made up of trillions of cells. Normally, human cell grow and divide to form new cells according to the requirement of the body and it vary person to person. When cancer starts to develop in the body the process of reconstruction of new cell stops and the cell becomes more and more abnormal and a new cell form which is not required. That extra cell grows without stopping and called as tumors. Cancerous tumors are malignant. This means that they can grow and spread into nearby tissues. In short diseases in which abnormal cells divide uncontrollably and destroy body tissue resulting tumors The skin is the largest organ of the body. The skin protects us from microbes and from the other harmful materials.

### Skin has three layers:

- **Epidermis**- the outer most layer of the skin and creates our skin tone.
- **Dermis** – it is beneath the epidermis and contains tough connective tissue and sweat glands.
- **Hypodermis** – made up of fat and connective tissue.

Most often skin cancer develops on skin exposed to the sun but it can also occur on areas which is not sun exposed.

There are three types of skin cancer-basel cell cancer, squamous cell cancer and melanoma tumors.

- **Basel cell**-it starts in basel layer of the skin. It occurs on the face.
- **Souamous cell** – it begins in squamous cell and mostly found in dark people.
- **Melanoma**- it begins in melocytes layer and occur at mouth and eyes.

The first two are not so common and do not spread quickly but the third skin cancer spread very quickly over the body. If it is not found in early stages, it is found to be more dangerous.

## II. LITERATURE SURVEY

Vascular segmentation through the use of image processing tools provides significant information that allows for the accurate diagnosis, categorization, registration, and visualization of vascular disease. Currently, in the assessment of Abdominal Aortic Aneurysms (AAA), radiologists manually segment different regions on interest on each medical image to create a full volume of the abdominal aorta. Such manual segmentation is a time consuming task, prone to errors and a subjective approach especially when non-contrast enhanced images are present. In this paper, we introduce an automatic system to segment the aortic lumen in non-contrast enhanced CT scans and PC-MR images using digital image processing algorithms where image enhancement, denoising, edge detection, and regional growing algorithms are utilized. The output of this work forms the basis for a future reliable inner and outer wall segmentation of the AAA.



## The Wheels of Life in Preeti Shenoy's *A Hundred Little Flames*

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### Abstract

India has a variety of cultures which are more common in south India. India's culture collectively refers to the thousands of unique and distinct cultures of all the religious and communities present in India. The language, religion, dance, music, architecture, food and customs of India vary from one place to another within the country. Indian culture has often described as a fusion of several cultures. Preeti Shenoy's "A Hundred Little Flames" revolves around relationship between father and a son across two generations. Ayan unravels mysteries surrounding in the life of his grandfather Gopal Shanker. Ayan, the protagonist of the novel, does not have any wish on his own. He feels like puppet in his father's hand. Ayan left his job due to an unfortunate incident in his office party. His father sent him to village to take care of his grandfather. During his stay at Poongavanam, Ayan find out the sad truth about his grandfather's past life Ayan determined to bring back his grandfather's lost love. The novel "A Hundred Little Flames" explores the lives of the people who forget to look during after their parents in their old age. They were busy running for the material treasure leaving behind their soulful treasure. Author cleverly wheels out the plot and reveals how the society succumbs itself blindly with so called modernism leaving behind their traditional inheritance and humanistic values.

**Keywords:** culture, relationship, family, friendship and elder abuse.

This article aims at the life of an old man, Gopal, whose hundred flames his desire are doused off by his progenies. The crushed and crumpled soul of Gopal longs for a hold. The generation gap exists between his kids and him bring in multiple disruptions in his life. This paper also investigates the generation gap that prevails among the main characters Gopal, Jairaj, Shaila and Ayan. And it will also enlightens us on a good path and brightens our lives like hundred little flames.

Preeti Shenoy was born in 1971 in India. She is an Indian writer, author and novelist. She is in the big league. She started her writing career with 34 Bubble gums and candies 2008 which received good response from readers. Her writing style is loved by thousands of peoples. Her books also gained a lot of popularity among readers. The novel A Hundred Little Flames begins with in Ayan, the protagonist of the novel, does not have any wish on his own. He was worked in MNC Company in Pune. Due to an unfortunate incident in his office party, he left his job. Though he is an obliging son, he is enforced to execute certain wishes of his father which he dislikes to the core. Ayan's father sends him to village to take care of his grandfather. During his stay at Thekke Madom in Kerala has changed his