Journal of Current Development in Artificial Intelligence

Journal of Current Development in Artificial Intelligence

Aims and Scope

Journal of Current Development in Artificial Intelligence is a Journal addresses concerns in applied research and applications of artificial intelligence (AI). the journal also acts as a medium for exchanging ideas and thoughts about impacts of AI research. Articles highlight advances in uses of AI systems for solving tasks in management, industry, engineering, administration, and education evaluations of existing AI systems and tools, emphasizing comparative studies and user experiences and the economic, social, and cultural impacts of AI. Papers on key applications, highlighting methods, time schedules, person months needed, and other relevant material are welcome.

Journal of Current Development in Artificial Intelligence

Managing Editor
Mr. Amit Prasad

Editorial Board Members

Journal of Current Development in Artificial Intelligence

Contents

Nanocomputing & Its Future Trends

[1] Jyotir Moy Chatterjee, [2] Somesh Dewangan

[1,2]Department of Computer Science & Engineering, RSR-RCET, Bhilai

E-mail: [1]jyotirm4@gmail.com, [2]somdew2016@gmail.com

A B S T R A C T

Nanocomputer is the intelligent name for a PC littler than the Microcomputer, which is littler than the minicomputer. Microelectronics segments that are at the focal point of all bleeding edge electronic contraptions use semiconductor transistors. The term nanocomputer is progressively used to imply general enrolling contraptions of size similar to a Visa. The key use of this name has all the earmarks of being to depict the s1mp3 made by The Flying Electron Inc. (7 November 2008). It is by and by used for a more broad scope of devices, for instance, Arduino, BeagleBoard, Olinuxino, Odroid, Miracast dongles, All the PC-on-a-stick (MK802 arrangement), Raspberry Pi. In the long run PCs will be made with basic parts that are no more prominent than two or three nanometers. There are a few ways nanocomputers might be manufactured, using mechanical, electronic, biochemical, or Quantum technology. In this paper we are rapidly portraying about the Nano Computing and its applications fields and its market estimate period 2016-2023.

Keywords - Nano computers, Microcomputer, Minicomputer, Microelectronics, Arduino, BeagleBoard, Olinuxino, Odroid, Miracast dongles, All the PC-on-a-stick (MK802 arrangement), Raspberry Pi

I. INTRODUCTION

Nanocomputing is a term utilized for the representation and manipulation of data by computers smaller than a microcomputer. Current gadgets are already using transistors with channels underneath 100 nanometers long. The present goal is to deliver computers smaller than 10 nanometers. Future advancements in nanocomputing will give resolutions to the present troubles of shaping registering technology at the nanoscale. For example, current nanosized transistors have been found to create a quantum tunneling impact where electrons 'tunnel' through barriers, making them unsuitable for use as a standard switch [1]. The increased registering power framed by nanocomputers will allow for the solution of exponentially troublesome real world issues. Nanocomputing also has the advantage of being created to fit into any environment, including the human body, while being undetectable to the naked eye. The small size of gadgets will allow for preparing energy to be shared by thousands of nanocomputers. Nanocomputing as DNA nanocomputers and quantum computers will require unexpected technology in comparison to current microcomputing strategies yet supply their own advantages. The various applications of Nanocomputing are as per the following:

II. DNA NANOCOMPUTING

Nanocomputing can be delivered by various nanoscale structures including biomolecules, for example, DNA and proteins. As DNA functions through a coding arrangement of four nucleobases it is suited for application in data handling. DNA nanocomputers could deliver faster critical thinking through the ability to investigate all potential solutions simultaneously. This is in contrast to conventional computers which take care of issues by investigating solution paths one at any given moment in a series of steps. Solutions to troublesome issues would never again be constrained by preparing time. DNA has the ability to give this level of processing ability at the nanoscale because of the unending conceivable

rearrangements of DNA through quality altering technology [2]. The large number of random hereditary code combination can be utilized for preparing solutions simultaneously, necessary for tackling exponentially troublesome real world issues. Practical applications of this theoretical technology will require the ability to control and program DNA adaptably [3]. The earliest applications of DNA to processing will probably be as transistor switches, defeating current microcomputing issues, for example, transistor tunneling. Biomolecular switches will have the capacity to control electron stream for computation through a change in composition of the DNA atoms or by adapting the amount of light scattered by the biomolecules. Alternative transistors have already been created utilizing DNA for biological nanocomputers. The DNA switch could be genetically programmed to create or repress the production of a protein. This would allow for the improvement of biological functions that can process disease diagnostics [4].

III. QUANTUM COMPUTING

Quantum figuring gives computational power at the nanoscale with abilities that reach beyond the limitations of conventional computers. This is because quantum computers store and manipulate data through the utilization of subatomic particles dynamics [5]. Binary computers process single pieces of information as a binary state, either a 1 or a 0. Subatomic particles have two states, however can also exist in any superposition of states. This means they are administered by the laws of quantum mechanics rather than classical material scienceallowing them to figure solutions to issues with greater speed while requiring less space. Future applications of quantum registering may include:

1. The simulation of medication response that is more proficient than current medical trials. This will lead to the faster advancement of new medications.
2. Greater understanding of disease advancement through enhanced computational models.
3. Enhanced transportation coordinations across the world.
4. Enhanced financial demonstrating to avoid economic downturns.
5. The advancement of driverless cars with the ability to process real world driving issues faster than human drivers.
6. The rapid handling of large amounts of astronomical data for finding new planets.
7. The production of quantum simulations for demonstrating the behavior of subatomic particles without the requirement for creating the outrageous conditions necessary for watching these particles.
8. Enhanced machine learning for artificial insight progression.

The global nano and miniaturized scale satellite market is required to develop with the CAGR of approximately 23.9% amid the forecast time frame 2016-2023. The nano and miniaturized scale satellite market is valued at around $1.08 billion out of 2016.The global nano and smaller scale satellite market is relied upon to reach to $4.85 billion before the finish of 2023. The developing number of nano and miniaturized scale satellite launches because of cost adequacy of the nano and small scale satellite is adding meaningful development in the global market. According to National Aeronautics and Space Administration (NASA), In 2015, they have launched around 3 nano and small scale satellite. Furthermore, in 2016, around 101 nano and miniaturized scale satellite was launched across the globe according to space works [6].

In any case, there are few factor, for example, lack of spending plan and delays in launch that are limiting the development of the global nano and miniaturized scale satellite market. The delays in launch is one of the major factor that is confining the development of the global nano and miniaturized scale satellite market. The major launch failure are as per the following:

June 2015; Failure of launch of Falcon 9 that is around 6 months' delays from the launch date November 2015; Failure of launch of Super Strypi that has come about into loss of 51 (small, nano, and miniaturized scale) satellites.

Along these lines, the delays in launch of satellite is backlogging the development chance of the global nano and smaller scale satellite market. In addition, the increasing application of nano and smaller scale satellite earth observation and remote detecting, technology, communication, and so forth is creating gigantic open door for the global nano and miniaturized scale satellite market. Developing demand for mapping and reviewing is one of the major factor that is developing demand for nano and smaller scale satellite in earth observation and remote detecting.

REFERENCE

[1] Cara, E.A.E. et al. 2009. An Introduction to Nanocomputing, Bioinspired And Nanoscale Integrated Computing, 1, pp. 130.http://onlinelibrary.wiley.com/doi/10.1002/9780470429983.ch1/summary

[2] Currin, A. et al. 2017. Computing exponentially faster: implementing a nondeterministic universal Turing machine using DNA, Journal of the Royal SocietyInterface, 14, e: 20160990. http://rsif.royalsocietypub lishing.org/content/14/128/2016099 0

[3] Bonnet, J. et al. 2013. Amplifying genetic logic gates, Science, 340, pp. 599603. http://science.sciencemag.org/content/340/6132/599

[4] Ambainis, A. 2014. What can we do with a quantum computer? In the Institute for Advanced Study Spring Letter. https://www.ias.edu/ideas/2014/ambainisquantumcomputing

[5] IBM: Applications of Quantum Computing. http://www.research.ibm.com/ibmq/learn/quantumcomputing applications/

[6] "Nano Technology." Searched Report, www.occamsresearch.com/categorynew/report_details.

Brief Survey on Network Security Attacks and Avoidance Mechanism

Neha Choubey

Assistant Professor Department of Computer Science, RSR Bhilai Chhattisgarh, India
E-mail: nehachb5@gmail.com

A B S T R A C T

Due to active need of computer's in business and other organizations many networks has been established. In today scenario attacks on computer networks has increased to a great extend. Networks are very much needed but they are very prone to attacks. Network security is the security provided to a network from unauthorized access and risks. It is the duty of network administrators to adopt preventive measures to protect their networks from potential security threats. Computer networks that are involved in every day transactions and communication within the government, individuals, or business require security. The most common and simple way of protecting a network resource is by assigning it a unique name and a corresponding password. There are several types of attacks which can go through in our networks or edge devices. In this paper we will study different types of attacks and how to protect our network.

Keywords: Security Goal; Security Attacks; Defensive mechanisms.

I. INTRODUCTION

The world is becoming more interconnected with the advent of the Internet and new networking technology. There is a large amount of personal, commercial, military, and government information on networking infrastructures worldwide. Network security is becoming of great importance because of intellectual property that can be easily acquired through the internet. Based on this research, the future of network security is forecasted. Many new trends that are also emerging will be considered to understand.

Network security:

System and network technology is a key technology for a wide variety of applications. Security is crucial to networks and applications. Although, network security is a critical requirement in emerging networks, there is a significant lack of There exists a "communication gap" between the developers of security technology and developers of networks. Network design is a well-developed process that is based on the Open Systems Interface (OSI) model. The OSI model has several advantages when designing networks. It offers modularity, flexibility, ease-of-use, and standardization of protocols. The protocols of different layers can be easily combined to create stacks which allow modular development. The implementation of individual layers can be changed later without making other adjustments, allowing flexibility in development.

When considering network security, it must be emphasized that the whole network is secure. Network security does not only concern the security in the computers at each end of the communication chain. When transmitting data the communication channel should not be vulnerable to attack.

A possible hacker could target the communication channel, obtain the data, and decrypt it and re-insert a false message. Securing the network is just as important as securing the computers and encrypting the message. When developing a secure network, the following need to be considered [1]:

a. Access – authorized users are provided the means to communicate to and from a particular network.
b. Confidentiality – Information in the network remains private.
c. Authentication – Ensure the users of the network are who they say they are.
d. Integrity – Ensure the message has not been modified in transit.
e. Non-repudiation – Ensure the user does not refute that he used the network.

Differentiating Data Security and Network Security: Data security is the aspect of security that allows a client's data to be transformed into unintelligible data for transmission. Even if this unintelligible data is intercepted, a key is needed to decode the message. This method of security is effective to a certain degree. Strong cryptography in the past can be easily broken today. Cryptographic methods have to continue to advance due to the advancement of the hackers as well. When transferring cipher text over a network, it is helpful to have a secure network. This will allow for the cipher text to be protected, so that it is less likely for many people to even attempt to break the code. A secure network will also prevent someone from inserting unauthorized messages into the network. Therefore, hard ciphers are needed as well as attack-hard networks [2].

The relationship of network security and data security to the OSI model is shown in Figure 1. It can be seen that the cryptography occurs at the application layer; therefore the application writers are aware of itsexistence. The user can possibly choose different methods of data security. Network security is mostly contained within the physical layer.Layers above the physical layer are also used to accomplish the network security required [2]. Authentication is performed on a layer above the physical layer. Network security in the physical layer requires failure detection, attack detection mechanisms, and intelligent counter measure strategies [2].
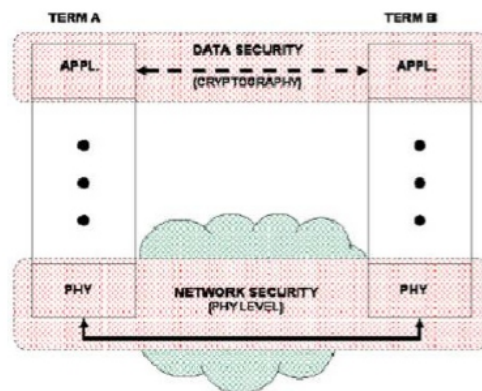
Figure 1: Based on the OSI model, data security and network Security have a different security function.

II. SECURITY GOALS FOR THE NETWORKS

Data Confidentiality:
Confidentiality is the ability to conceal messages from a\ passive attacker so that any message communicated via the sensor network remains confidential. This is the most important issue in network security. A sensor node should not reveal its data to the neighbours.

Data Authentication:
Authentication ensures the reliability of the message by identifying its origin. Attacks in sensor networks do not just involve the alteration of packets; adversaries can also inject additional false

packets [4]. Data authentication verifies the identity of the senders and receivers. Data authentication is achieved through symmetric or asymmetric mechanisms where sending and receiving nodes share secret keys. Due to the wireless nature of the media and the unattended nature of sensor networks, it is extremely challenging to ensure authentication.

Data Integrity:
Data integrity in sensor networks is needed to ensure the reliability of the data and refers to the ability to confirm that a message has not been tampered with, altered or changed. Even if the network has confidentiality measures, there is still a possibility that the data integrity has been compromised by alterations. The integrity of the network will be in trouble when:
    a. A malicious node present in the network injects false data.
    b. Unstable conditions due to wireless channel cause damage or loss of data.[4]

Data Availability:
Availability determines whether a node has the ability to use the resources and whether the network is available for the messages to communicate. However, failure of the base station or cluster leader's availability will eventually threaten the entire sensor network. Thus availability is of primary importance for maintaining an operational network.

Data Freshness:
Even if confidentiality and data integrity are assured, there is a need to ensure the freshness of each message. Informally, data freshness [4] suggests that the data is recent, and it ensures that no old messages have been replayed. To solve this problem a nonce, or another time related counter, can be added into the packet to ensure data freshness.

Self-Organization:
A wireless sensor network is a typically an ad hoc network, which requires every sensor node be independent and flexible enough to be self-organizing and self-healing according to different situations. There is no fixed infrastructure available for the purpose of network management in a sensor network. This inherent feature brings a great challenge to wireless sensor network security. If self-organization is lacking in a sensor network, the damage resulting from an attack or even the risky environment may be devastating.

Time Synchronization:
Most sensor network applications rely on some form of time synchronization. Furthermore, sensors may wish to compute the end-to-end delay of a packet as it travels between two pair wise sensors. A more collaborative sensor network may require group synchronization [4] for tracking applications.

Secure Localization:
Often, the utility of a sensor network will rely on its ability to accurately and automatically locate each sensor in the network. A sensor network designed to locate faults will need accurate location information in order to pin point the location of a fault. Unfortunately, an attacker can easily manipulate non secured location information by reporting false signal strengths, replaying signals. This Section has discussed about the security goals that are widely available for wireless sensor networks and the next section explains about the attacks that comm. Only occur on wireless sensor networks.

III. ATTACKS ON NETWORKS

Attacks on networks are as follows:

Eavesdropping:
Interception of communications by an unauthorized party is called eavesdropping. Passive eavesdropping is when the person only secretly listens to the networked messages. On the other hand, active eavesdropping is when the intruder listens and inserts something into the communication stream. This can lead to the messages being distorted. Sensitive information can be stolen this way [8].

Viruses:
Viruses are self-replication programs that use files to infect and propagate [8]. Once a file is opened, the virus will activate within the system.

Worms:
A worm is similar to a virus because they both are self-replicating, but the worm does not require a file to allow it to propagate [8]. There are two main types of worms, mass-mailing worms and network aware worms. Mass mailing worms use email as a means to infect other computers. Network-aware worms are a major problem for the Internet. A network-aware worm selects a target and once the worm accesses the target host, it can infect it by means of a Trojan or otherwise.

Trojans:
Trojans appear to be benign programs to the user, but will actually have some malicious purpose. Trojans usually carry some payload such as a virus [8].

Phishing:
Phishing is an attempt to obtain confidential information from an individual, group, or Organization [9]. Phishers trick users into disclosing personal data, such as credit card numbers, online banking credentials, and other sensitive information.

IP Spoofing Attacks:
Spoofing means to have the address of the computer mirror the address of a trusted computer in order to gain access to other computers. The identity of the intruder is hidden by different means making detection and prevention difficult. With the current IP protocol technology, IP spoofed packets cannot be eliminated [8].

Denial of Service:
Denial of Service is an attack when the system receiving too many requests cannot return communication with the requestors [9]. The system then consumes resources waiting for the handshake to complete. Eventually, the system cannot respond to any more requests rendering it without service.

Node Subversion:
Capture of a node may reveal its information including disclosure of cryptographic keys and thus compromise the whole sensor network. A particular sensor might be captured, and information (key) stored on it might be obtained by an adversary. [6]

Node Malfunction:

A malfunctioning node will generate inaccurate data that could expose the integrity of sensor network especially if it is a data-aggregating node such as a cluster leader [6].

Node Outage:

Node outage is the situation that occurs when a node stops its function. In the case where a cluster leader stops functioning, the sensor network protocols should be robust enough to mitigate the effects of node outages by providing an alternate route [6].

Physical Attacks:

Sensor networks typically operate in hostile outdoor Environments. In such environments, the small form factor of the sensors, coupled with the unattended and distributed nature of their deployment make them highly susceptible to physical attacks, i.e., threats due to physical node destructions. Unlike many other attacks mentioned above, physical attacks destroy sensors permanently, so the losses are irreversible. For instance, attackers can extract cryptographic secrets, tamper with the associated circuitry, modify programming in the sensors, or replace them with malicious sensors under the control of the attacker.

Message Corruption:

Any modification of the content of a message by an attacker compromises its integrity. [9]

False Node:

A false node involves the addition of a node by an adversary and causes the injection of malicious data. An intruder might add a node to the system that feeds false data or prevents the passage of true data. Insertion of malicious node is one of the most dangerous attacks that can occur. Malicious code injected in the network could spread to all nodes, potentially destroying the whole network, or even worse, taking over the network on behalf of an adversary.[9]

Node Replication Attacks:

Conceptually, a node replication attack is quite simple; an attacker seeks to add a node to an existing sensor network by copying the node ID of an existing sensor node. A node replicated in this approach can severely disrupt sensor network's performance. Packets can be corrupted or even misrouted. This can result in a disconnected network, false sensor readings, etc. If an attacker can gain physical access to the entire network he can copy cryptographic keys to the replicated sensor nodes. By inserting the replicated nodes at specific network points, the attacker could easily manipulate a specific segment of the network, perhaps by disconnecting it altogether. [1]

Passive Information Gathering:

An adversary with powerful resources can collect information from the sensor networks if it is not encrypted. An intruder with an appropriately powerful receiver in well designed antenna can easily pick off the data stream. Interception of the messages containing the physical locations of sensor nodes allows an attacker to locate the nodes and destroy them. Besides the locations of sensor nodes, an adversary can observe the application specific content of messages including message IDs, timestamps and other fields. To minimize the threats of passive information gathering, strong encryption techniques needs to be used. [8]

This section explained about the attacks and their classification that widely happens on wireless sensor networks. The next section discusses about the security mechanisms that are used to handle the attacks.

SECURITY MECHANISMS
Following are the various security mechanisms:

Low-Level Mechanism:
Low-level security primitives for securing sensor networks includes,
    a. Key establishment and trust setup
    b. Secrecy and authentication
    c. Privacy
    d. Robustness to communication denial of service
    e. Secure routing
    f. Resilience to node capture

Key establishment and trust setup:
The primary requirement of setting up the sensor network is the establishment of cryptographic keys. Generally the sensor devices have limited computational power and the public key cryptographic primitives are too expensive to Follow. Key-establishment techniques need to scale to Networks with hundreds or thousands of nodes. In addition, the communication patterns of sensor networks differ from traditional networks; sensor nodes may need to set up keys with their neighbors and with data aggregation nodes. The disadvantage of this approach is that attackers who compromised sufficiently and many nodes could also reconstruct the complete key pool and break the scheme. [1]

Secrecy and authentication:
Most of the sensor network applications require protection against eavesdropping, injection, and modification of packets. Cryptography is the standard defense. Remarkable system trade-offs arise when incorporating cryptography into sensor networks. For point-to-point communication[2], end-to-end cryptography achieves a high level of security but requires that keys be set up among all end points and be Incompatible with passive participation and local broadcast. Link-layer cryptography with a network wide shared key simplifies key setup and supports passive participation and local broadcast, but intermediate nodes might eavesdrop or alter messages. The earliest sensor networks are likely to use link layer cryptography, because this approach provides the greatest ease of deployment among currently available network cryptographic approaches. [6]

Privacy:
Like other traditional networks, the sensor networks have also force privacy concerns. Initially the sensor networks are deployed for legitimate purpose might subsequently be used in unanticipated ways. Providing awareness of the presence of sensor nodes and data acquisition is particularly important. [1]

Robustness to communication denial of service:
An adversary attempts to disrupt the network's operation by broadcasting a high-energy signal. If the transmission is powerful enough, the entire system's communication could be jammed. More sophisticated attacks are also possible; the adversary might inhibit communication by violating the 802.11 medium access control (MAC) protocol by, say, transmitting while a neighbor is also transmitting or by continuously requesting channel access with a request-to send signal.[1]

Secure routing:

Routing and data forwarding is a crucial service for enabling communication in sensor networks. Unfortunately, current routing protocols suffer from many security vulnerabilities.

1

For example, an attacker might launch denial of- service attacks on the routing protocol, preventing communication. The simplest attacks involve injecting malicious routing information into the network, resulting in routing inconsistencies. Simple authentication might guard.

CONCLUSION

Network security is an important field that is day by day very raipdly gaining attention as the internet expands. The security threats and internet protocol were analyzed to determine the necessary security technology. The security technology is mostly software based, but many common hardware devices are used. The current development in network security is not admirable. This paper focuses on the various types of attacks and their classifications in wireless sensor networks and the security mechanism widely used to handle those attacks. This survey will probably motivate future researchers to come up with elegant and more powerful security mechanisms and make their network safer.

REFERENCES

[1] Adrian Perrig, John Stankovic, David Wagner, "Security in Wireless Sensor Networks" Communications of the ACM, Page53-57, year 2004.

[2] Dowd, P.W.; McHenry, J.T., "Network security: it's time to take it seriously, "Computer, vol.31, no.9, pp.24-28, Sep1998.

[3] Al-Sakib Khan Pathan, Hyung-Woo Lee, ChoongSeon Hong, "Security in Wireless Sensor Networks: Issues and Challenges", International conference on Advanced Computing Technologies, Page1043-1045, year 2006.

[4] Chris Karlof, David Wagner, "Secure Routing in Wireless Sensor Networks: Attacks and Countermeasures", AdHoc Networks (elsevier), Page: 299-302, 2003.

[5] Ian F. Akykildiz, Weilian Su, Yogesh Sankarasubramaniam, and ErdalCayirci, "A Survey on Sensor Networks", IEEE Communication Magazine, 2002.

[6] John Paul Walters, Zhengqiang Liang, Weisong Shi, Vipin Chaudhary, "Wireless Sensor Network Security: A Survey", Security in Distributed, Grid and Pervasive Computing Yang Xiao (Eds), Page3-5, 10-15, 2006.

[7] Pathan, A.S.K.; Hyung-Woo Lee; ChoongSeon Hong, "Security in wireless sensor networks: issues and challenges" Advanced Communication Technology (ICACT), Page(s):6, 2006.

[8] Tahir Naeem, Kok-Keong Loo, Common Security Issues and Challenges in Wireless Sensor Networks and IEEE 802.11 Wireless Mesh Networks, International Journal of Digital Content Technology and its Applications, Page 89-90 Volume 3, Number 1, 2009.

[9] Undercoffer, J., Avancha, S., Joshi, A. and Pinkston, J. "Security for sensor networks". In Proceedings of the CADIP Research Symposium, University of Maryland, Baltimore County, USA, year 2002 .

[10] Zia, T.; Zomaya, A., "Security Issues in Wireless Sensor Networks", Systems and Networks Communications (ICSNC) Page(s):40 – 40, 2006.

[11] Ammar Yassir, Smitha Nayak," Cybercrime: A threat to Network Security," IJCSNS International Journal of Computer Science and Network Security, VOL.12 No.2, February 2012.

Using Strength Factors Fingerprint Verification based Ridges

[1] **Somesh Dewangan**, [2] **Shivendra Shivani**, [3] **Lokesh Singh**, [4] **Siddharth Choubey**, [5] **Jyotir Moy Chatterjee**

[1] Department of Computer Science and Engineering RSR-Rungta College of Engineering and Technology Bhilai
[2] Department of Computer Science and statics, Trinity College Dublin, Ireland
[3] Department of Mechanical Engineering, RSR-Rungta College of Engineering and Technology Bhilai
[4] Department of Computer Science and Engineering Shri Shankracharya Technical Campus, Bhilai
[5] Department of Computer Science and Engineering RSR-Rungta College of Engineering and Technology Bhilai
Email: [1] somdew2016@gmail.com, [2] s.shivani@gmail.com, [3] lokeshsingh25@gmail.com,
[4] siddhartha00@rediffmail.com, [4] siddhartha00@rediffmail.com, [4] jyotirm4@gmail.com

A B S T R A C T

In This Paper With the increasing emphasis on the automatic personal identification applications, biometrics especially fingerprint identification is the most reliable and widely accepted technique. In this paper Fingerprint Verification based on fusion of Minutiae and Ridges using Strength Factors (FVMRSF) is presented. The proposed algorithm has better matching percentage for different fingerprints compared to the existing algorithms.

Keywords - Minutiae, Ridge, Dilation, Ridge Bifurcations, Block Filter, Hough

I. INTRODUCTION

The biometric acknowledgment of a man alludes to the utilization of certain physiological or behavioral highlights to decide the personality of a Furthermore, straightforward passwords are anything but difficult to figure by an impostor, while troublesome passwords might be difficult to review by a real client. Biometrics has the capacity to recognize an approved client and faker. The rise of biometric innovation has given an appealing substitute to take care of the issues display in conventional confirmation techniques. Unique mark is the most viable and generally utilized biometric system in individual ID for a few centuries. Among the various sort of well known individual recognizable proof strategies, unique mark ID is the most develop and dependable procedure.. Unique finger impression acknowledgment exploits the way that the finger impression has some exceptional qualities, for example, particulars and the edges. The utilization of multibiometric frameworks is considered as one of the keys to enhance the precision of biometric frameworks, than single biometric parameter and one coordinating calculation. Unique mark innovation is utilized by countless individuals every day to get to organize PCs, PC/Network Access, Physical Security/Time, Attendance and Civil ID. Numerous army installations and government structures utilize PCs to check fingerprints of representatives before they are confessed to secure zones. The unique mark applications are isolated into three classifications (I) Forensic applications utilized for criminal examination, psychological oppressor distinguishing proof, parenthood assurance, missing youngsters and so on (ii) Government applications, National ID cards, adjustment office, Driving permit, Passport Control and so on. (iii) Commercial applications are learning based framework, for example, Computer Network Logic, Electronic Data Security, E-trade, Internet Access, ATM, Credit Cards, Cellular Phones, Personal Digital Assessment and Medical Record Management.

Commitment: In this paper particulars and edge based strategies are at the same time utilized as a part of request to enhance the coordinating execution and to diminish the false coordinating proportion significantly.

II. RELATED WORK

Michael Kucken and Newell [1] examined the theory on the improvement of epidermal edges viz., (I) the epidermal edge design is set up because of clasping precariousness following up on the basal layer of the epidermis and bringing about the essential edges. (ii) The clasping procedure basic unique mark improvement is controlled by the burdens shaped in the basal layer and not by the bends of the skin surface and (iii) the anxieties that decide edge bearing are themselves dictated by limit powers acting at wrinkles and nail wrinkle, ordinary removals which are most articulated near the edge. Ashish Mishra et. al., [2] proposed the calculation in view of introduction field of the unique mark, over which slope channel cover was utilized to identify the center focuses in the unique mark picture. Bazen and Gerez [3] displayed strategies for the estimation of a high determination directional field from fingerprints. The directional field identifies the solitary focuses and the introductions of the focuses. Yun and Cho [4] proposed a versatile preprocessing strategy, which extricates five highlights from the unique finger impression pictures, examines picture quality with grouping technique, and upgrades the pictures asindicated by their attributes. Brankica M. Popovi'c and L. Maskovic [5] utilized multiscale directional data acquired from introduction field picture to channel the spurious details. The element extraction in design acknowledgment framework is to remove data from the info information and depends incredibly on the nature of the pictures. Multiscale directional data evaluated in light of introduction field estimation. F. A. Afsar et. al., [6] displayed the details based Automatic Fingerprint Identification Systems. The method depends on the extraction of particulars from the diminished, binarized and divided adaptation of a unique finger impression picture. The framework utilizes unique finger impression characterization for ordering amid unique mark coordinating. G. Jagadeeswar Reddy et. al., [7] exhibited unique mark denoising utilizing both wavelet and Curvelet Transforms. The hunt adjustment strategy performs superior to particulars based coordinating for unique mark twofold limitation diagram coordinating since verifiable arrangement of two finger impression pictures are not required. K. Zebbiche and F. Khelifi [8] introduced biometric pictures as one Region of Interest (ROI) that has the information handled by most biometric based frameworks. The plan comprises of inserting the watermark into ROI in unique finger impression pictures. Discrete Wavelet Transform and Discrete Fourier Transform are utilized. Bhupesh Gour et. al., [9] presented midpoint edge shape portrayal to extricate the particulars from unique mark pictures. Shading coding plan is utilized to examine each edge just once. Seung Hoon chae and Jong Ku Kim [10] proposed Fingerprint Verification in which both details and edge data are utilized to diminish the blunders because of deficient arrangement or contortion. Aparecido Nilcau Marana and A. K. Jain [11] proposed Ridge Based Fingerprint coordinating utilizing the Hough change. The significant straight lines that match the unique mark edges are utilized to evaluate pivot and interpretation parameters.

Anil K Jain et al., [12] portrayed the utilization of strategic relapse technique to coordinate different unique mark coordinating calculations. The incorporation of Hough change coordinating, string separation coordinating and 2D dynamic programming based coordinating utilizing the calculated relapse has limited the False Rejection Rate for a predetermined level of False Acceptance Ratio. Fanglin Chen et al., [13] proposed a calculation for recreating unique mark introduction field from spared particulars and is utilized as a part of the coordinating stage to contrast and the details from the inquiry finger impression. The introduction fields figured from the spared particulars is a worldwide

component and the spared details are the neighborhood include, are utilized to get more data. Chunxian Ren et al., [14] utilized the half and half calculation in view of straight classifier to isolate forefront and foundation squares. The pixel savvy classifier utilizes three pixel highlights, for example, Coherence, mean and change. Hartwig Fronthaler et al., [15] proposed a multigrid portrayal of a discrete differential scale space improvement methodology of unique mark acknowledgment framework. The unique mark picture is disintegrated utilizing Laplacian Pyramid as pertinent data is focused inside a couple of recurrence groups. The Fausian Directional Filtering is utilized to improve edge valley example of unique finger impression utilizing 1-D separating on higher pyramid level. The straight symmetric highlights are utilized to remove the neighborhood edge – valley introduction. Shabana Tadvi and Mahesh Kalte [16] proposed the strategy for consolidating the particulars highlights and wavelet factual highlights to acquire the half and half unique finger impression coordinating. Manvjeeth Kaur et al., [23] proposed unique finger impression confirmation framework embracing numerous strategies to fabricate a particulars extractor and a details matcher. The strategy with a few changes like division utilizing morphological operation, diminishing, particulars checking with exceptional triple branch tallying, Minutiae unification by breaking down a branch into three terminations, coordinating the bound together x – y co-ordinate framework are employed.Liu Wei [24] depicted Rapid Singularity Searching for unique finger impression grouping. The calculation utilizes Delta Poincare Index and Rapid Classification to characterize the unique finger impression into five classes. The Singularity is accomplished by location calculation which looks through the bearing field that has the bigger directional change. Arun Ross et al., [25] proposed the half breed unique mark matcher which utilizes the mix of edge qualities and an arrangement of details focuses. Zhang Yuanyuan and Jing Xianjun [26] introduced the unique mark picture upgrade calculation where the qualities of the Gabor channel capacities were investigated both in spatial and unearthly space to get channel conceal parameters. These parameters were then convolved with the advanced picture to improve the unique finger impression picture.

III. MODEL
In this section we discuss definitions and FVMRSF model.

3.1 Definitions:
    (i) Fingerprint: Impression of a finger gained from advanced scanners.

    (ii) Minutiae: Ridge bifurcations, Ridge endings in unique finger impression picture.

    (iii) Ridge bifurcation: The edge parts into two edges.

    (iv) Ridge end: The edge end point.

    (v) False Minutiae: The focuses which are mistakenly recognized as particulars.

    (vi) Pores: The examples which are uniformly put along the edges.

3.2 Block Diagram of FVMRSF called top coat. Top coat was done of Yttria Stabilized Zirconia (YSZ) by APS. Parameters of top coat parameter are given in Table 3.
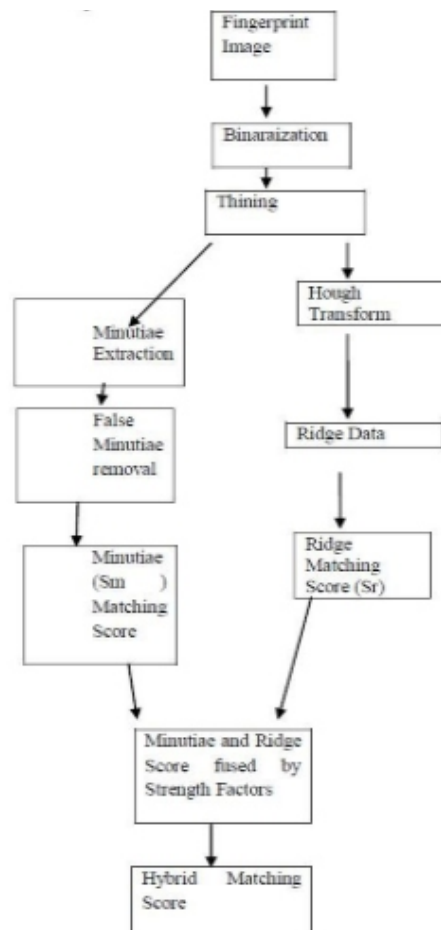
Fig 1. Block Diagram of FVMRSF.

3.2.1 Fingerprint Image

A gray-level fingerprint image (I) of size 640*480 from the data base fvc2004 is considered.

3.2.2 Binarization

The way toward changing over a grayscale picture to parallel picture is known as binarization. In a dark scale unique mark picture, a pixel can go up against 256 distinctive force levels. The edge esteem is utilized to change over grayscale picture to parallel. The pixel esteems underneath the limit are set to zero and the power esteems more noteworthy than the edge is alloted one. In twofold picture the pixel esteems are alloted 0 and 1 to high contrast pixels separately. The handling of double picture is simple as it has just two power levels contrasted with dark scale picture of 256 force levels. Figure 2 indicates unique mark picture and its comparing binarized image. The impediment of binarization is that the edges end close to the limit is considered as minutia despite the fact that it isn't genuine minutia. The issue of binarization is killed in diminishing procedure.


(a)Original image   **(b) Binarized image**
Fig 2. Fingerprint Binarization

3.2.3 Thinning:

The thickness of edge is changed over into single pixel wide by keeping unique introduction and area of the details to guarantee precise estimation by diminishing and is executed utilizing Block Filter. Expansion is utilized to thicken the territory of the valleys in the unique finger impression accordingly the edges are adequately disintegrated. A traditionalist organizing component comprising of four ones orchestrated in a two-by-two square is utilized for the valley expansion to accomplish some edge width lessening, while at the same time limiting the discontinuities.
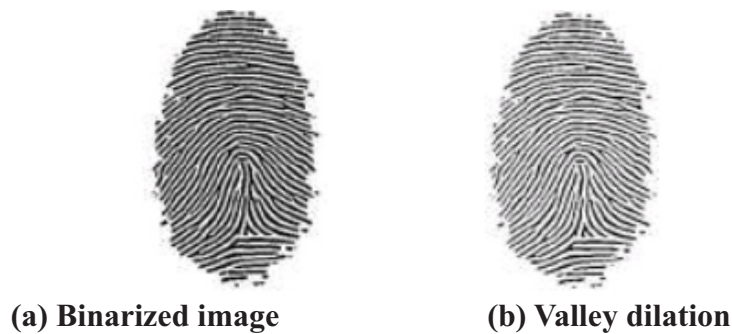
(a) Binarized image   **(b) Valley dilation**
Fig 3. Ridge Thinning.

3.2.4 Block Filtering

The thinning technique is to protect the furthest pixels along each edge. The outskirt is settled for unique mark picture to wipe out goad particulars by allocating pixel esteems as one for initial five lines, last five lines, initial five sections and last five segments. The left to right output for edges that climb and right, while ideal to left sweep for edges that move down and left is utilized to lessen edge width to one pixel. The two outputs are joined to decrease edge width to one pixel for entire unique mark as appeared in Figure 4.
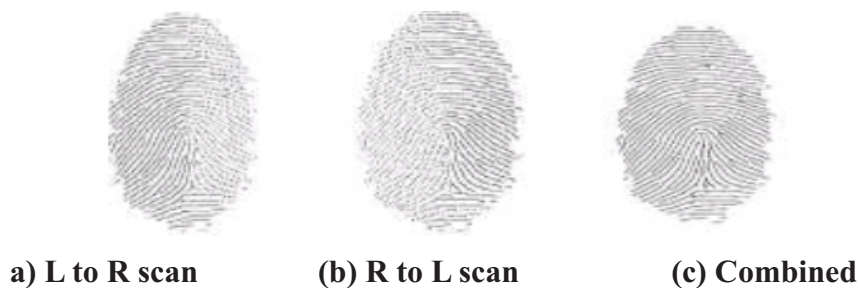
a) L to R scan   **(b) R to L scan**   **(c) Combined**
Fig 4. Scanned output of filter.

The isolated noise is killed utilizing pixel box strategy by processing crossing number for each dark pixel in the diminished unique finger impression. The intersection number is a large portion of the entirety of contrast between neighboring pixel combines that encompassed the given dark pixel
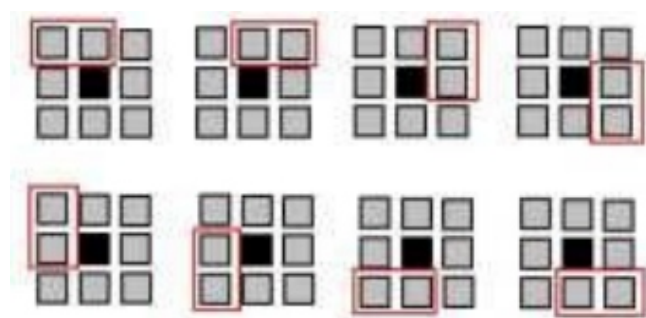
Fig 5. Eight sets of adjacent pixels pairs

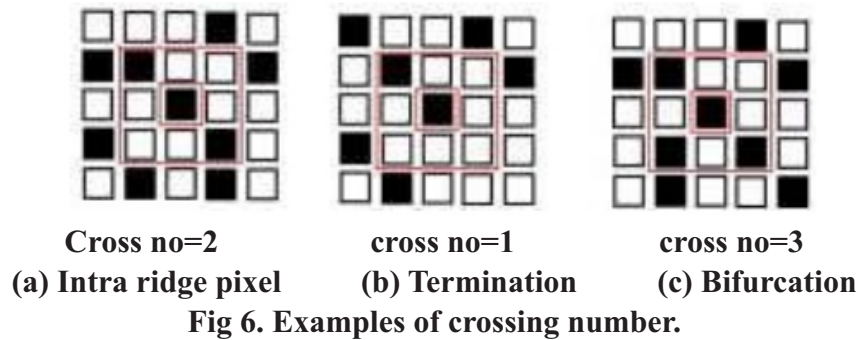**Cross no=2** **cross no=1** **cross no=3**
(a) Intra ridge pixel **(b) Termination** **(c) Bifurcation**
Fig 6. Examples of crossing number.

The intersection number relating to each dark pixel contained in the picture is registered and used to erase undesirable goads. The edge is resolved as undesirable goad if the follow achieves a bifurcation point in under twenty pixels.

(a) Before removing spurs   **(b) After removing spurs**
Fig 7. Removing spurs.
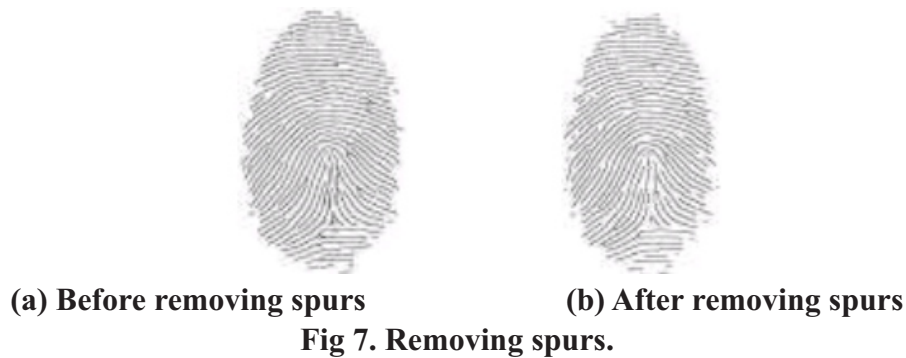
3.2.5 Final Noise Removal

The noise created by binarization and diminishing is wiped out by recognizing the short island portions close to the external limit of the picture. Beginning at every end the edge is followed pixel by pixel and if another end is come to inside the length of seventeen pixels from the end, it is considered as island section and is erased. In the event that no end is experienced until the point that the most extreme follow length is come to with no adjustments, at that point that section is held. Figure 9 indicates short island fragments.

(a) Before **(b) Island segments to** **(c) After**
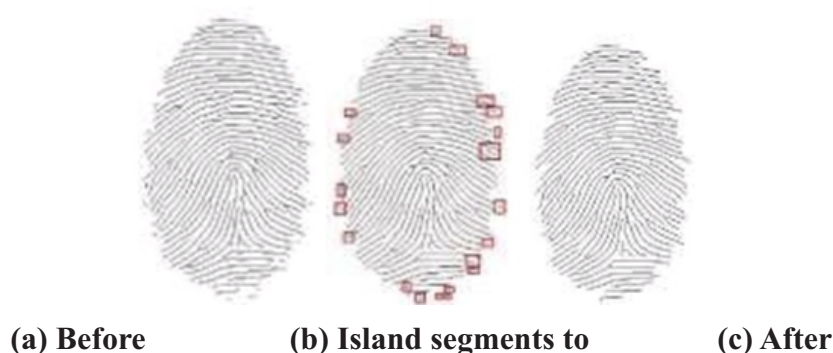
3.2.6. Minutiae Extraction

The focal point of the oval is built up by finding the base and greatest lines and sections that contain an edge pixel, at that point figuring the line and segment that lie somewhere between these extremes. The real hub of this circle is exactly chosen as 94% of the distinction between the base and greatest lines containing an edge pixel, though the minor pivot is observationally chosen as 86% of the contrast between the base and most extreme segments with an edge pixel. Figure10. Demonstrates the oval created for a unique finger impression.

3.2.7 False Minutia Removal

The normal between edge width (D) alludes to the normal separation between two neighboring edges. The methodology in evacuating false minutia is: (I) If the separation between one bifurcation and one end is not as much as D and the two details are in a similar edge, expel them two. (ii) If the separation between two bifurcations is not as much as D and they are in a similar edge, expel the two bifurcations. (iii) If two terminations are inside a separation D and their bearings are correspondent with a little point variety, they fulfill the condition that no other end is situated between the two terminations, and afterward the two terminations are viewed as false minutia got from a broken edge, and are expelled. (iv) If two terminations are situated in a short edge with length not as much as D, expel the two terminations.

Matching score

The procedure includes contrasting the arrangement of particulars information removed from input picture to an arrangement of details information separated from layout picture. The coordinating starts by making a lattice, called turn esteems, of the introduction edge distinction between every layout particulars, Tk ($1 \leq k \leq$ NT), and each information details, Im ($1 \leq m \leq$ NI). NT and NI speak to the aggregate number of details in the format and info picture, individually. The incentive at rotatevalues(k,m) speaks to the distinction between the introduction points of Tk and Im. Tk and Im speak to the separated information in every one of the sections of column k and line m in the format and information grids, individually.

Instead of contrasting line and segment lists, the examination is presently in view of the relative position of the details with respect to the reference particulars. The relative places of the particulars continue as before even as the total position of the unique finger impression picture changes. The contrast between the format and information is registered for the outspread separation, spiral point, and introduction edge. Two details are resolved to coordinate in the event that (I) without a doubt the outspread separation contrast is not as much as a resilience of three pixels. (ii) indisputably the spiral edge contrast is not as much as a resistance of five degrees. (iii) The supreme introduction point contrast is not as much as a resilience of ten degrees. (iv) The two particulars are a similar sort. A coordinating

score speaking to the likeness between the datasets is ascertained for every blend of reference focuses utilizing the aggregate number of particulars coordinated for each situation. Condition 3 demonstrates the equation for figuring the coordinating score when Tk and Im are being utilized as reference.

Minutiae matching score (k,m) = Number of minutiae pair

$$------------------ \quad Min(M!...Mn)$$

IV. ALGORITHM

Problem definition: The Fingerprint is verified using Fingerprint Verification based on fusion of Minutiae and Ridges using Strength Factors.

Objectives of the algorithm are:
(i) The Minutiae Extraction using thinned image by Block Filter.
(ii) The true ridge information is extracted by Hough Transform.
(iii) The true minutiae and ridges information are combined to get matching score.

Assumption: Data base of fvc2004 [18] is considered for performance analysis.
Table 1 Algorithm of FVMRSF

Input : Fingerprint Image
Output: Verified Fingerprint Image

1. Binarizing the gray scale fingerprint image.
2. Ridge thickness of binarized image is reduced to 1- pixel width by thinning of the image by Block Filter.
3. Minutiae extraction is done on thinned image by considering the region of interest by using an Ellipse
4. False Minutiae removal.
5. Extracting the ridge information of the image by Hough Transform.
6. Compute the minutiae and ridge matching scores.
7. Compute the hybrid matching score.

$$HMS= \alpha \ Sr + \beta \ 2 \ Sm$$

V. PERFORMANCE ANALYSIS

The Fingerprint information base of fvc2004 is considered for the execution investigation. The execution of particulars method is poor for low quality unique finger impression pictures, for example, little zone of cover between the format and inquiry picture. The edge based strategy has drawback contrasted with particulars method as the quantity of parameters for coordinating are less, thus it might dismiss bona fide unique finger impression. The mix of both particulars and edge based procedure enhances the execution comes about by wiping out disservices of every strategy. In the current Hybrid Fingerprint Matcher (HFM) strategy, the details coordinating scores are registered with two methods of particulars extraction.

The proposed technique has rate change in the scope of 10 to 54 contrasted with the current HFM strategy when two distinct Fingerprints are looked.

CONCLUSION

Unique finger impression check is most dependable attributes for individual recognizable proof as it is special and relentless. In this paper we proposed Fingerprint Verification in view of combination of Minutiae and Ridges utilizing Strength Factors in which the particulars and edge strategies are joined. The Block Filter and Hough Transform are utilized to remove details and edges individually. The FVMRSF gives better outcomes for various unique mark coordinating contrasted with existing calculations. In Future, the Wavelet Transform is acquainted with enhance the outcomes further.

REFERENCES

[1] Shashi Kumar D.R,R.K. Chhotaray,K.B. Raja, Sabyasachi Pattnaik," Fingerprint Verification based on Fusion of Minutiae and Ridges using Strength Factors", International Journal of Computer Applications (0975-888) Volume 4 –No. 1,July 2010
[2] M. Kucken and A. C. Newell, "Fingerprint Formation," Proceedings of Journal of Theoretical Biology, pp. 71–83, 2005.
[3] Ashish mishra and Madhu Shandilya,"Fingerprint Core Point Detection using
[4] Gradient Field Mask," International Journal of Computer Applications, vol 2, pp19-23, 2010.
[5] Bazen and Gerez, "Extraction of Singular Points from Directional Fields of Fingerprints," Annual Centre for Telematics and Information Technology Workshop, vol 24, pp 905-919, July 2002.

[6] M. P. Brankica and L. Maskovic, "Fingerprint Minutiae Filtering Based on Multiscale Directional Information," FACTA Universitatis-Series: Electronics and Energetics, vol. 20, pp.233-244, August 2007.

[7] F. A. Afsar, M. Arif and M. Hussain, "Fingerprint Identification and Verification System using Minutiae Matching," National Conference on Emerging Technologies, pp.141-146, 2004.

[8] G. Jagadeeswar Reddy, T. Jaya Chandra Prasad and M. N. Giri Prasad, "Fingerprint Image Denoising using Curvelet Transform," Proceedings of Asian Research Publishing Network Journal of Engineering and Applied Sciences, vol 3, no 3, pp. 31-35, June 2008.

[9] K. Zebbiche and F. Khelifi, "Region-Based Watermarking of Biometrics Images: Case Study in Fingerprint Images," Proceedings of International Journal of Digital Multimedia Broadcasting, pp. 1-13, 2008.

[10] Bhupesh Gour, T. K. Bandopadhyaya and Sudhir Sharma, "Fingerprint Feature Extraction using Midpoint Ridge Contour Method and Neural Network," Proceedings of International Journal of Computer Science and Network Security, vol.8, no.7, pp. 99-103, July 2008.

[11] Seung-Hoon Chae and Jong Ku Kim "Ridge-Based Fingerprint Verification for Enhanced Security," Digest of Technical Papers International Conference on Consumer Electronics, pp 1-2, 2009.

[12] A. N. Marana, and A. K. Jain, "Ridge-Based Fingerprint Matching using Hough Transform," IEEE Proceedings of the Brazilian Symposium on Computer Graphics and Image Processing, pp. 112-119, October 2005.

[13] A. K. Jain, S. Prabhakar and A. Chen, "Combining Multiple Matchers for a High Security Fingerprint Verification System," Pattern Recognition Letters, Elsevier Science Direct, vol. 20, pp 1371- 1379, 1999.

[14] Fanglin Chen and Jie Zhou, "Reconstructing Orientation Field from Fingerprint Minutiae to Improve Minutiae- Matching Accuracy," IEEE Transactions on image processing, vol. 18, no 4, pp 1665-1670, July 2009.

[15] Chunxiao Ren and Yilong Yin, "A Linear Hybrid Classifier for Fingerprint Segmentation," Fourth International Conference on Neural Computation, pp 33-37, November 2008.

[16] Hartwig Fronthaler and Klaus Kollreider, "Local Features for Enhancement and Minutiae Extraction in Fingerprints," IEEE Transactions on Image Processing, vol. 17, no 3, pp 354-363, 2008.

[17] Shabana Tadvi and Mahesh Kalte, "A Hybrid System for Fingerprint Identification," International Journal of Computer Science and Engineering, vol 2, no 3, pp 767-771, 2010.

[18] Liu Wei and Zhou Cong, "Efficient Gradual Segmentation of Fingerprint Images," Proceedings of Sixth WSEAS International Conference on Multimedia Systems and Signal Processing, pp 67-70, 2006.

[19] Finger Print verification through competation table.

[20] Hemanth Krishnappa and Hongyu Guo, "Fingerprint Verification using Mutual Information," Journal of The Consortium for Computing Sciences in Colleges, pp 15-22,2008.

[21] Swapnali Mahadik, K Narayanan, D V Bhoir and Darshana Shah, " Access Control System using Fingerprint Recognition," International Conference on Advances in Computing, Communication and Control, pp 306-311, 2009.

[22] Yi Chen and A K Jain, "Beyond Minutiae: A Fingerprint Individuality Model with Patteren, Ridge and Pore Features," International Conference on Biometrics, pp 523-533, 2009.

[23] Jong KU Kin, Seung-Hoon Chae, Sung Jin Lim and Sung Bum Pan, " A Study on the Performance Analysis of Hybrid Fingerprint Matching Methods," International Journal of Future Generation Communication and Networking, pp 23- 28, 2008.

[24] Manvjeet Kaur, Mukhwinder Singh, Akshay Giridhar and Parvinder S. Sandhu, " Fingerprint Verification System using Minutiae Extraction Technique," Proceedings of World Academy of Science, Engineering and Technology, vol 36, pp 497-502, 2008.

[25] Liu Wei, "Fingerprint Classification using Singularities Detection," International Journal of Mathematics and Computers in Simulation, vol 2, issue 2, pp 158-162, 2008.

[26] Arun Ross, Anil Jain and James Reisman, "A Hybrid Fingerprint Matcher," Proceedings of International Conference on Pattern Recognition, pp 1661-1673, 2003.

[27] Zhang yuanyuan and Jing Xianjun, "Spectral Analysis Based Fingerprint Image Enhancement Algorithm," International Conference on Image Analysis and Signal Processing. pp 656- 659, 2010.

A Scrutinized Study on Robotics Mechanism & Capability Evaluation

[1]Srijani Ghatak, [2]Jyotir Moy Chatterjee, [3]Ritesh Kumar Ram, [4]Somesh Dewangan

[1,2,4]Department of CSE, RSR-RCET, Bhilai
[3]BE 4th Year CSE student
E-mail: [2]jyotirm4@gmail.com

A B S T R A C T

The motivation behind this paper is to show a study of general automated frameworks and execution investigation. This paper will likewise show thoughts and research from three related fields inside apply autonomy: assistive mechanical technology, human robot collaboration, and self-ruling apply autonomy. In each of these cases the data gave is planned to help with future research by giving the scientific classification and ideas of that field. The most essential thought this paper tries to pass on is to know about all parts of a framework before examining, and to maintain a strategic distance from examination blunders coming about because of limited focus. Processing.

Keywords - Robotics, Human Robot Interaction, Benchmarking.

I. INTRODUCTION

Mechanical technology is various zone of concentrate with applications in various fields and parts of society. Legitimately planned mechanical frameworks that consider how they advantage human clients make utilization of various strategies for assessment. With the end goal of this paper Robotics will be characterized as a mechanical framework controlled by inserted or other PC frameworks with the reason for streamlining human assignments. As this is an overview paper, points will be talked about at a larger amount and give understanding to additionally look into. This paper will likewise examine the qualifications between a few fields inside mechanical technology. The main segment will cover assistive apply autonomy, trailed by human robot collaboration, independent mechanical technology, constant automated frameworks, and assessment entanglements.

II. ASSISTIVE ROBOTICS

Assistive Robotics is a zone of apply autonomy that arrangements with using robots as instruments as opposed to undertaking based self-sufficient frameworks. The utilization of apply autonomy as an assistive device requires an uncommon arrangement of measurements instead of the sole utilization of the ordinary assignment consummation time metric. While Assistive Robotics covers various zones where robots are used as instruments, here the concentration will be in the territory of medicinal undertakings for the situation of recovery, amicability, simplicity of operation, and adequacy of info gadget are more appropriate to give valuable outcomes [Tsui08]. The rest of this segment will address the improvement of assistive apply autonomy, examine clinical applications, lastly the advance in setting up standard benchmarks investigation. Uses of Nano Technology is spread in changed different regions and the vast majority of the specialists are engaged also, proceeding with the improvements in the Nanoinvestigation.

III. INNOVATION DEVELOPMENT CHALLENGES

This area will concentrate on the formation of new gadgets and their convenience. One of the troubles of testing frameworks in assistive mechanical technology is the low number of trials, which give great knowledge, yet are restricted by human weakness. Running a large number of trials isn't commonsense or financially savvy. The time included would likewise keep the information gathered so far from being utilized to dissect the framework and enhance execution, and in this manner, personal satisfaction. For instance, on account of building up a prosthetic arm, run of the mill measurements were considered, for example, time to finish an assignment and precision of the errand. Past these measurements, analysts likewise checked blood oxygen levels and carbon dioxide generation. This enables a beginning time gadget to be examined and contrasted with its organic partner. Since the objective characterized by assistive robots is to make assignments less demanding, an inability to perform in any event keeping pace with common frameworks implies another look must be taken at the plan. The time span included is likewise a basic reason watchful idea must be taken while picking components to watch. On account of prosthetic appendages and stroke restoration, testing time ranges are on the request of a half year. With such prolonged stretch of time outlines, including pointless components squander both time and cash, while giving minimal future advantage to patients [Tsui09]

IV. CLINICAL APPLICATION

This segment disks how assistive innovation is connected to a given end-client populace. At this stage, assistive apply autonomy are being utilized consistently, and investigation can be led to gage where future endeavors for advancement are required. While assessing the mental endeavors used to work an assistive automated framework, Functional Independence Measure (FIM), Rating Scale for Mental Efforts (RSME), and Standardized Mini- Mental State Examination are ordinarily utilized, yet different measures do exist [Tsui08]. These scales help give some level of quantitative information with respect to the execution of assistive apply autonomy frameworks as saw by clients. This exhibits the troubles in endeavoring to sum up apply autonomy to a state of a solitary assessment and examination system, which will be talked about later.

V. BENCHMARKS AND EVALUATION

Assessment execution of assistive mechanical technology can be troublesome with the human component display. As proposed by David Feil- Seiferet al. [5] in table 1, an arrangement of benchmark criteria exists. While it may not be decisive, it helps future scientists in the field by making them mindful of the human component of the framework. The induction of the table stems from a Stanford University test, which included surveys for patients to accumulate non-quantitative information, for example, helpfulness and convenience of the ProVAR framework.

Robotic Technology	Social Interaction	Assistive Technology
Safety	Autonomy	Impact on User's Care
Scalability	Imitation	Impact on Care Givers
	Privacy	Impact on User's Life
	Understanding of Domain	
	Social Success	

Table 1. Propose of Benchmarks for the field of Assistive Robotics

Different things to remember are the place and why a framework will be utilized. Since the frameworks here of apply autonomy are proposed to help human partners, high throughput of the mechanical framework alone may really be unfavorable, as the clients capacity to process include from the framework won't have the capacity to keep up. A reasonable agreement has risen here, that taking note of the objective of the framework before outlining and assessing it is maybe the most vital advance in the assessment procedure. Interfacing with robots as an assistive apparatus is just a single piece of the cooperation that happens amongst people and robots. The following area will talk about changing levels of collaboration amongst people and automated frameworks.

VI. HUMAN ROBOTIC INTERACTION

The association amongst human and mechanical frameworks penetrates every single automated framework to some level. The three principle levels examined in this segment include: full human, fractional human, and people as onlookers. Assistive mechanical autonomy, in the past area, ties into full and fractional human cooperation, while independent apply autonomy in segment four essentially concentrates on people as onlookers. A key point to remember for this area is the means by which every component influences trust of the framework [Freedy07]. While the automated framework all alone might be prepared to do high throughput rates, if the framework isn't used the throughput tumbles to zero. The rest of this area will talk about information procurement and how this applies to single and multi- robot frameworks.

VII. AUTONOMOUS ROBOTICS

The concentration of this area is to show the improvement of trial plan in self-ruling mechanical technology, and its utilization in current frameworks. Nearly, the gauges of trial strategies have not made an indistinguishable progression from different fields, but rather late endeavors have been made to utilize reenactment to redress this [Amigoni10]. With the end goal of this paper, self-governing apply autonomy will be characterized as the utilization of robots in eccentric conditions without nonstop human mediation.For instance, neglecting to consider satisfactory learning of true qualities at last prompts troubles when the frameworks goes past recreation into this present reality. Mulling over the properties of this present reality field the frameworks will perform in likewise misses the mark regarding the entire picture, as clamor introduce in reality should likewise be managed before displaying and reenactment. Considering this, the reproduction results ought to be approved against genuine execution to separate any disparities in the data.

Two famous test systems specified in [Amigoni10], Player/Stage and USARSim will be talked about in this area. The principal, Player/Stage, which can be gotten from http://playerstage.sourceforge.net/, is included two projects working in conjunction. The player program divide permits any PC with a system association with speak with sensors on the robot.As addressed in the past area, measurements are firmly combined with the space of the automated framework. Components of constant parts may exist in different frameworks; in any case, the framework in general does not concentrate on keeping up the

qualities of an ongoing framework. For example, while watching the impact of a most pessimistic scenario execution situation is significant, to keep up constant execution the framework load ought to stay under half of its ability [yoon09]. Continuous frameworks do impart a few qualities to general mechanical frameworks, including concentrating tuning endeavors on bottleneck segments. Humanoid robots specifically have segment bottlenecks, however require the general framework to hold fast to constant necessities.

CONCLUSION

In conclusion, the ideas displayed in this paper concerning apply autonomy can be connected to numerous different fields also. The possibility that an arrangement ought to be well thoroughly considered before testing is a piece of all territory of apply autonomy say, and when all is said in done is a best practice. For mechanical autonomy specifically it is important that the best possible level of self-sufficiency be resolved before investigation to appropriately assess framework execution. The objective of this paper was to indicate three levels of metric determination and investigation. These levels included measurements concentrated on human side of framework, measurements with an adjust of human and robot variables, and frameworks concentrated on the automated side of frameworks. The traps said are firmly attached to the zone of mechanical technology a framework is a piece of, and fluctuate from metric choice to nonappearance of the human component in the plan procedure. It is additionally essential to be aware of the objectives of the frameworks, and maintain a strategic distance from incorrect measurements that won't gave helpful investigation.

REFERENCES

[1] [Helmer09] Scott Helmer, David Meger et al., "Semantic Robot Vision Challenge: Current State and Future Directions", 2009,

[2] [Yoon] Hobin Yoon/Jungmoo Song et al, "Real-Time Performance Analysis in Linux-Based Robotic Systems", 2009

[3] [Haddadin] Sami Haddadin et al.,"Requirements for Safe Robots: Measurements, Analysis and New Insights", 2009, The International Journal of Robotics Research

[4] [Tsui2008] Katherine M. Tsui/Holly A. et al, "Survey of Domain-Specifc Performance Measures in Assistive Robotic Technology", 2008

[5] [Feil] David Feil-Seifer, Kristine Skinner and Maja J. Mataric, "Benchmarks for evaualting socially assistive robotics", Interaction Studies: Psychological Benchmarks of Human-Robot Inteaction, Vol 8, no 3, pages 423-429, 2007

[6] [Freedy] Amos Freedy et al., "Measurement of Trust in Human-Robot Collaboration", 2007,

[7] [Tsui2009] Katherine Tsui, David Feli-Seifer, et al., "Performance Evaluation Methods for Assistive Robotic Technology", 2009

[8] [Amigoni] Francesco Amigoni, Viola Schia?onati, "Good Experimental Methodologies and Simulation in Autonomous Mobile Robotics", 2010

[9] [Crandall] Jacob W. Crandall and M. L. Cummings, "Identifying Predictive Metrics for Supervisory Control of Multiple Robots", 2007

[10] Kensuke Harada, ShuujiKajita, et al., "An Analytical Method on Real-time Gait Planning for a Humanoid Robot", 2005, http://www.lira.dist.unige.it/teaching/SINA_08 09/SINA_PREV/library/HUMANOIDS 2004/paper/60_paper. pdf

A Study Report on Image Segmentation Techniques

[1]Somesh Kumar Dewangan, [2]Jyotir Moy Chatterjee

[1,2] Department of Computer Science and Engineering RSR-Rungta College of Engineering and Technology Bhilai

Email: [1]somdew2016@gmail.com, [2]jyotirm4@gmail.com

A B S T R A C T

Segmentation is considered as one of the primary strides in picture handling. It separates a computerized picture into various locales so as to break down them. It is likewise used to recognize diverse questions in the picture. A few picture division strategies have been produced by the analysts with a specific end goal to influence pictures to smooth and simple to assess. This paper displays a writing survey of fundamental picture division procedures from most recent five years. Late research in each of picture division system is displayed in this paper.

Keywords - Fuzzy theory, PDE based image segmentation, segmentation, threshold

I. INTRODUCTION

Popular systems of picture division which are as yet being utilized by the specialists are Edge Detection, Threshold, Histogram, Region based techniques, and Watershed Transformation. Since pictures are isolated into two sorts based on their shading, i.e. dark scale and shading pictures. In this way picture division for shading pictures is very surprising from dim scale pictures, e.g., content based picture retrieval[1], [2]. Likewise which calculation is powerful and functions admirably is relies upon the sort of picture [3]. The property of a pixel in a picture and data of pixels close to that pixel are two essential parameters for any picture division calculation. It can likewise be speaking to as comparability of pixels in any district and irregularity of edges in picture. Edge based division is utilized to partition picture based on their edges. Area based strategies utilized the edge keeping in mind the end goal to isolate the foundation from a picture, while neural system based methods utilized the learning calculation to prepare the picture division process [4]. The outcome taken from picture division process is the fundamental parameter for additionally picture preparing research; this outcome will likewise decide the nature of further picture handling process. Picture division calculations assume a critical part in medicinal applications, i.e., conclusion of infections identified with mind [5]-[8] heart, knee, spine, pelvis, prostate and vein, and pathology restriction. In this way, Image division is as yet an exceptionally hot region of research for picture preparing field. It is as yet a testing errand for analysts and engineers to build up a general system for picture division [9].

Picture division is likewise used to separate distinctive questions in the picture, since our picture is partitioned into frontal area and foundation, though closer view of picture is identified with the locale of intrigue, and foundation is whatever is left of the picture. Henceforth, picture division will isolate these two sections from each other. In this way, the fundamental three methodologies for picture division are, Threshold, Edge, and Region based [10].

II. LITERATURE REVIEW OF IMAGE SEGMENTATION TECHNIQUES

All basic image segmentation techniques currently being used by the researchers and industry will be discussed and evaluate in this section.
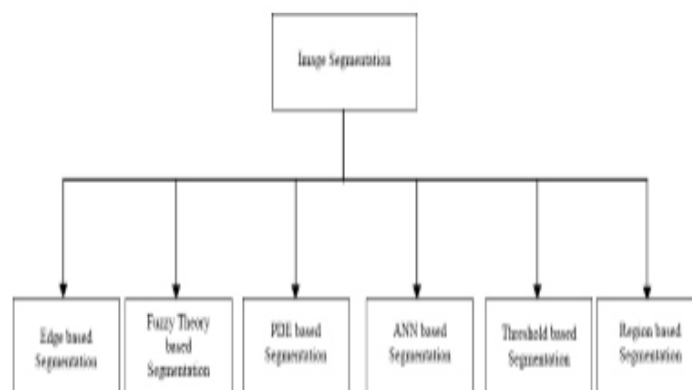
A. Edge Based Image Segmentation

Fernando C. Monteiro [11] proposed a new image segmentation method comprises of edge and region based information with the help of spectral method and morphological algorithm of watershed. Firstly, they reduce the noise from image using bilateral filter as a pre-processing step, secondly, region merging is used to perform preliminary segmentation, region similarity is generated and then graph based region grouping is perform using Multi-class Normalized Cut method [12]. Berkley segmentation dataset is use as a dataset. They compare the technique with mean shift, multi-scale graph based segmentation, and JSEG. It is found that proposed technique has outperformed other methods and produce better results.

R. V. Patil [13] claims that if the number of clusters is estimated in accurate manner, K-means image segmentation will provide better results. They proposed a new method based on edge detection to estimate number of clusters. Phase congruency is used to detect the edges. Then these edges are used to find clusters. Threshold and Euclidean distance is used in order to make clusters. K-means is sued to find the final segmentation of image. MATLAB is used to implement the proposed technique. Experiments are performed on nine different images and results shows that number of clusters is accurate and optimal. Weihong Cui Yi Zhang [14] proposed an edge based auto threshold select method to generate multi-scale image segmentation. Band weight and NDVI (Normalized Difference Vegetation Index) is used to calculate edge weight. MST andEdge based Threshold method is used to perform image segmentation. Experiments are performs on multi-scale resolution images, i.e.,Q u i c k - bird multispectral images. Results have shown that their method maintain the object information and keep object boundaries while segment the image. Anna Fabijańska [15] introduced a new method uses Variance Filter for edge detection in image segmentation process. Their method found the edge position using Variance Filter. Sobel Gradient filter with K-means is also used to extract the edges and compared with the proposed technique. The effect of filtering window size on determining edges is also discussed and it is found that if the 9×9 window is used to extract edges then edge is complete accurately match the shape of object in the Image of picture.

Fig. 1. Image segmentation technique

Mohammed J. Islam [16] found that Computer Vision is a best answer for continuous review of cases in pharmaceutical industry. Creator has built up a framework for quality review utilizing edge based image segmentation methods [17]. They utilized Sobel Edge Detector [18] so as to distinguish edges with commotion concealment property. After edge identification, Otsu Thresholding system is utilized for confinement of foundation and closer view pixels. Tests are led and results are contrasted and NN-based segmentation procedure building Visual C++. Results beat NN method based on exactness and preparing time contrast of 10 ms.

B. Fuzzy Theory Based Image Segmentation

Liu Yucheng [19] proposed another fuzzy morphological based fusion image segmentation calculation. Calculation has utilized morphological opening and shutting operations to smooth the image and after that play out the inclination operations on the resultant image [20]. After contrast the proposed combination calculation and Watershed algorithm[21] and Prewitt techniques, it is discovered that combination approach take care of the issue of over- segmentation of Watershed calculation. It additionally spare the data points of interest of image and enhance the speed too. Syoji Kobashi [22] utilized scale based fuzzy associated image segmentation and fuzzy object model to section the cerebral parenchyma area of new conceived cerebrum MRI image. Frontal area locale is isolated in initial step, rectification of MRI power in-homogeneity is performed next, and after that scale-base Fuzzy Object Model (FOM) is connected on resultant image. Consequences of proposed technique are assessed based on Fast Positive Volume Fraction (FPVF) and Fast Negative Volume Fraction (FVNF). Results from try have demonstrated that FOM (Fuzzy object model) has accomplished least FPVF and FVNF esteems. Refik Samet [23] proposed a new Fuzzy Rule based image segmentation technique to segment the rock thin segment images. They take RGB image of rock thin segment as input and give segmented mineral image as output. Fuzzy C Means is also applied on rock thin images and results are compared of both techniques. Firstly, the user will take sample image from minerals; features are distinguished on the basis of red, green and blue components of image. Membership function is defined for each component using Fuzzy rules. Each membership function represents the color's distribution in the image. Strong and weak points are defined, whereas strong points are considered as seed points and weak points become their members. Results have shown that proposed technique is better than FCM algorithm. Muhammad Rizwan Khokher [24] presented a new method of image segmentation using Fuzzy Rule based system and Graph Cuts. Authors have firstly segmented the gray scale, color, and texture images using Graph Cuts. Weights are assigned to the features of image using Fuzzy Rules. Their algorithm works by firstly extracting the features of image, calculate the constants using fuzzy rules, calculate the weighted average of constants to find the similarity matrix, partition the graph using Normalized Graph Cut method[25], and finally get the segmented image from partitioned graph. Berkley database is used to evaluate the algorithm. Simulation is performed in Matlab and C language. Results are evaluated on the basis of Mean, Standard Deviation, and PPV value. It is found that most of the evaluation measure range from 0.85 to 0.95 for S.D and PPV.

C. Partial Differential Equation (PDE) Based Image Segmentation

Jinsheng Xiao [26] proposed a new non-linear discontinue partial differential equation (PDE) that models the level set method of gray images. A discrete method is also proposed to find numerical solution and to implement the filter. Non-Linear discontinue PDE formula is applied on image of cameramen using MATLAB. Results have shown that image edges and boundaries are remained blurred and can be shifted by using Close operator. More information can be saved by using the proposed scheme. Fengchun Zhang [27] presents a variation model using 4th order PDE with 2nd order PDE for finger vein image de-noising. Midpoint Threshold segmentation technique is used to extract the region of interest accurately. 4th order PDE has reduced the noise very well, whereas 2nd order PDE has approximated the boundaries effectively. It can be observed from experiments that PSNR value of proposed method is increase by 2 dB. Method is compared with threshold based segmentation algorithm and it is found that proposed method has segment the real finger vein image accurately. Chun Yuan[28] proposed a new segmentation model for color images. Their model is based on Geodesic Active Contour (GAC) model. But GAC is only restricted to gray scale images. Therefore their model is also an extension of GAC model, and known as color-GAC model. It uses the expression of the Gradient of color image.

D. Artificial Neural Network (ANN) Based Image Segmentation

Wencang Zhao [29] proposed another image segmentation calculation based on textural features [30] and Neural Network[31] to isolate the focused on images from foundation. Dataset of smaller scale CT images are utilized. De-noising channel is utilized to expel commotion from image as a pre-handling step, Feature extraction is performed next, and afterward Back Propagation Neural Network is made, and in conclusion, it alters the weight number of system, and spare the yield. Proposed calculation is contrasted and Thresholding strategy and Region Growing technique. Results have demonstrated that proposed system beats different techniques based on speed and precision of segmentation. Lijun Zhang [32] proposed a new neural network based image segmentation system for color images. They combined the Wavelet Decomposition and Self Organizing Map (SOM) to propose a new method, i.e., SOM-NN. Voting among child pixels selected the parent pixel. After initialization, ANN found the segmentation result which satisfies all levels. Wavelet decomposition is performed to remove noise. Hence wavelet decomposition and SOM-NN are combined to perform segmentation. Results have shown that method has reduce noise and produce accurate segmentation. Shohel Ali Ahmed [33] proposed Image Texture Classification procedure based on Artificial Neural Networks (ANN). Right off the bat, image is caught and pre-preparing is performed, after it, highlight extraction[34] is performed, though, ANN classifier [35] is utilized for surface grouping, Clustering is performed to isolates foundation from sub-images. Prepared ANN consolidates the information pixels into two groups which give comes about. It delivers the surface grouping and segmentation of image.

E. Threshold Based Image Segmentation

Shiping Zhu [36] proposed a new threshold based edge detection and image segmentation algorithm. They calculate the threshold of each pixel in the image on the basis of its neighboring pixels. They also find the edges of image with the help of proposed algorithm. A threshold of each pixel was set using histogram. PDF is used to isolate the background and threshold of image. They implement their algorithm in Visual C++. Results outperform the Canny Operator results, because it performs edge detection and segmentation simultaneously. Anping XU [37] proposed a threshold-based level set approach comprising both threshold based segmentation and Fast Marching Method (FMM) for medical image segmentation [38]. The result of de- noising filter is passed to FMM for segmentation purpose with the help of threshold based level set technique. They implement their method in VC++ and ITK. After the experiment, results have shown that level set method based on threshold results in clearer, accurate and more perfect segmentation, it also avoid from edge leakage and improve the speed of segmentation Wu Kaihua and Ban Tao [39] have presented a new optimal threshold segmentation method based on entropy criteria and Genetic algorithm in order to improve the image acquisition process in computer vision. The factors taken by them are illumination, light, reflection of light, CCD exposure time and some properties of image histogram. They compare their proposed technique with Otsu algorithm and found that their algorithm is efficient in searching and in finding threshold based segmentation of an image. Frank Jiang [40] proposed a new multilevel Threshold-based segmentation technique using PSO and Wavelet mutation. They also proposed a new PSO algorithm which is used in first two steps of algorithm. Then the output of PSO is passed to wavelet mutation operations which performs the mutation operation and update the PSO equations after it. This work will generate optimized threshold and correct segmentation. After comparing their method with HCOCLPSO, they found that it produces optimal threshold as compare to other method. They claim that their algorithm is best for real time applications, e.g., error resilient video application in hostile environment.

F. Region Based Image Segmentation

D. Barbosa [41] proposed another image segmentation system which joins the edge and locale based data with unearthly strategy utilizing Morphological Watershed calculations. Initially commotion channel is utilized with Magnitude Gradient in a pre-preparing stage, besides, pre- segmentation is finished utilizing area consolidating, at that point locale likeness diagram is created lastly segmentation is performed utilizing Multi Class Normalized Cut. Strategy is contrasted and Mean Shift, MNCUT, and JSEG utilizing normal images. Proposed procedure beats Spectral Clustering technique. Group Chen [42] found that quick extraction of object data from a given image is as yet an issue for ongoing image handling. They additionally found that area based strategies are likewise tedious and not give successful segmentation. They proposed another district based technique based on Least Square strategy so as to identify objects strongly. They utilized a weight grid for area based strategy which additionally considers the neighborhood data and furthermore the utilization of Least Square technique gives ideal and quick segmentation. Correlation of their technique is led with Otsu strategy and Chan-Vese technique utilizing Lena image. Their strategy can remove the highlights more precisely than different strategies. Zhen Hua, Yewei Li [43] proposed another image segmentation technique based on enhanced visual consideration and district developing methodology. The dim esteems and edges of information image are removed utilizing Gabor channel [44] and Guass-Laplace channels [45]. Then ANN methods are used to extract the region of interest. Experiments are conducted on natural scene images, and it is found that their algorithm not only segmented the image perfectly but also found the salience edges which others can't. Tiancan Mei [46] claims that Markov random field (MRF) [47] is suffered from lack of handling the large range of interaction. In order to overcome this drawback of MRF, they presented a new supervised image segmentation method, i.e., Region based Multi-scale segmentation method. Natural scene images are used as a dataset. By using region as a parameter in Multi- scale MRF model, their algorithms perform better than other techniques. It is observed from results that RSMAP improve the MSAP method used for image segmentation.

CONCLUSION

In this paper, we talked about and examined fundamental image segmentation procedures utilized with the end goal of image examination. It is discovered that there is no ideal strategy for image segmentation on the grounds that the consequence of image segmentation is relies upon many elements, i.e., pixel shading, surface, force, comparability of images, image substance, and issue space. In this way, it isn't conceivable to consider a solitary technique for all kind of images nor all strategies can perform well for a specific sort of image. Thus, it regards utilize half breed arrangement comprises of various techniques for image segmentation issue.

REFERENCES

[1] C.R.C. Lima, J.M. Guilemany, "Adhesion improvements of Thermal Barrier Coatings with HVOF thermally sprayed bond coats", Surface and Coatings Technology, vol.201,no.8,pp.4694–4701,15 January 2007,.

[2] Esfahanian, A. Javaheri, and M. Ghaffarpour, "Thermal analysis of an SI engine piston using different combustion boundary condition treatments", Applied Thermal Engineering,vol.26,p Esfahanian, A. Javaheri, and M. Ghaffarpour, "Thermal analysis of an SI engine piston using different combustion boundary condition treatments", Applied Thermal Engineering,vol.26,pp.277-287,2006.", Surface and Coatings Technology,vol. 203, pp. 91-98, 2008.

[3] Anna Gilbert, Esfahanian, A. Javaheri, and M. Ghaffarpour, "Thermal analysis of an SI engine piston using different combustion boundary condition treatments", Applied Thermal Engineering,vol.26,pp.277-287,2006., Surface and Coatings Technology,vol..202,pp.2152-2161,2008.

[4] T. Hejwowski, and A. Weronski, "The effect of thermal barrier coatings on diesel engine performance", Vacuum, vol.65, pp.427-432, 2002.

[5] E. Buyukkaya, "Thermal analysis of functionally graded coating Al-Si alloy and steel pistons", Surface and Coatings Technology, vol.202, pp. 3856-3865, 2008.

[6] E. Esfahanian, A. Javaheri, and M. Ghaffarpour, "Thermal analysis of an SI engine piston using different combustion boundary condition treatments", Applied Thermal Engineering, vol.26, pp.277-287,2006.,pp.398-402,2007.

[7] M. Cerit, V. Ayhan, A. Parlak, and H. Yasar, "Thermal analysis of a partially ceramic coated piston: Effect on cold start HC emission in a spark ignition engine", Applied Thermal Engineering, vol. 31, no. 2–3, pp.336-341,2011.

[8] Michael Anderson Marr, "An Investigation of Metal and Ceramic Thermal Barrier Coatings in a Spark-Ignition Engine", M.S thesis, Mechanical and Industrial Engineering, University of Toronto, 2009.

[9] V. Esfahanian, A. Javaheri, and M. Ghaffarpour, "Thermal analysis of an SI engine piston using different combustion boundary condition treatments", Applied Thermal Engineering, vol.26, pp.277-287,2006.

[10] Muhammet Cerit, "Thermo mechanical analysis of a partially ceramic coated piston used in an SI engine", Surface & Coatings Technology, vol.205, pp. 3499- 3505,2011.

[11] Daniel W Parker, "Thermal barrier coatings for gas turbines, automotive engines and diesel equipment", Materials & Design, Vol. 13, no. 6, pp. 345-351,1992.

[12] H. Jamali, R. Mozafarinia, R. Shoja Razavi, and R. Ahmadi- Pidani, "Fabrication and Evaluation of Plasma-Sprayed Nanostructured and Conventional YSZ Thermal Barrier Coatings", Ceramic International, vol.38, pp.6805- 6712,2012.

[13] R. Ahmadi-Pidani, R. Shoja-Razavi, R. Mozafarinia, and H. Jamali, "Improving the thermal shock resistance of plasma sprayed CYSZ thermal barrier coatings by laser surface modification", Optics and Lasers in Engineering, vol.50, pp.780–786,2012.

[14] W. Cui and Y. Zhang, "Graph based multispectral high resolution image segmentation," in Proc. International Conference on Multimedia Technology (ICMT), pp. 1-5, 2010.

[15] A. Fabijanska, "Variance filter for edge detection and edge- based image segmentation," in Proc. International Conference on Perspective Technologies and Methods in MEMS Design (MEMSTECH), pp. 151-154, 2011.

[16] M. J. Islam, S. Basalamah, M. Ahmadi, and M. A. S. Ahmed, "Capsule image segmentation in pharmaceutical applications using edge-based techniques," IEEE International Conference on Electro/Information Technology (EIT), pp. 1-5, 2011.

[17] M. SHARIF, M. RAZA, and S. MOHSIN, "Face recognition using edge information and DCT," Sindh Univ. Res. Jour. (Sci. Ser.), vol. 43, no. 2, pp. 209-214, 2011.

[18] W. Haider, M. S. Malik, M. Raza, A. Wahab, I. A. Khan, U. Zia, J. Tanveer, and H. Bashir, "A hybrid method for edge continuity based on Pixel Neighbors Pattern Analysis (PNPA) for remote sensing satellite images," Int'lJ. of Communications, Network and System Sciences, vol. 5, pp. 624-630, 2012.

[19] L. Yucheng and L. Yubin, "An algorithm of image segmentation based on fuzzy mathematical morphology," in International Forum on Information Technology and Applications, IFITA'09, pp. 517-520, 2009.

[20] W. Haider, M. Sharif, and M. Raza, "Achieving accuracy in early stage tumor identification systems based on image segmentation and 3D structure analysis," Computer Engineering and Intelligent Systems, vol. 2, pp. 96-102, 2011.

[21] M. S. A. Shahzad, M. Raza, and K. Hussain, "Enhanced watershed image processing segmentation," Journal of Information & Communication Technology, vol. 2, pp. 1-9, 2008.

[22] S. Kobashi and J. K. Udupa, "Fuzzy object model based fuzzy connectedness image segmentation of newborn brain MR images," in Proc. IEEE International Conference on Systems, Man, and Cybernetics (SMC), pp. 1422-1427, 2012.

[23] R. Samet, S. E. Amrahov, and A. H. Ziroglu, "Fuzzy rule- based image segmentation technique for rock thin section images," 1in Proc. 3rd International Conference on Image Processing Theory, Tools and Applications (IPTA), pp. 402-406, 2012.

[24] M. R. Khokher, A. Ghafoor, and A. M. Siddiqui, "Image segmentation using fuzzy rule based system and graph cuts," in Proc. 12th International Conference on Control Automation Robotics & Vision (ICARCV), pp. 1148-1153, 2012.

[25] M. Sharif, S. Mohsin, M. J. Jamal, and M. Raza, "Illumination normalization preprocessing for face recognition," in Proc. International Conference on Environmental Science and Information Application Technology (ESIAT), pp. 44-47, 2010.

[26] J. Xiao, B. Yi, L. Xu, and H. Xie, "An image segmentation algorithm based on level set using discontinue PDE," in Proc. First International Conference on Intelligent Networks and Intelligent Systems, ICINIS'08., pp. 503-506, 2008.

[27] F. Zhang, S. Guo, and X. Qian, "Segmentation for finger vein image based on PDEs denoising," in Proc. 3rd International Conference on Biomedical Engineering and Informatics (BMEI), pp. 531-535, 2010.

[28] C. Yuan and S. Liang, "Segmentation of color image based on partial differential equations," in Proc. Fourth International Symposium on Computational Intelligence and Design (ISCID), pp. 238-240, 2011.

[29] W. Zhao, J. Zhang, P. Li, and Y. Li, "Study of image segmentation algorithm based on textural features and neural network," in International Conference on Intelligent Computing and Cognitive Informatics (ICICCI), pp. 300- 303, 2010.

[30] M. Sharif, M. Y. Javed, and S. Mohsin, "Face recognition based on facial features," Research Journal of Applied Sciences, Engineering and Technology, vol. 4, pp. 2879- 2886, 2012.

[31] M. Yasmin, M. Sharif, and S. Mohsin, "Neural networks in medical imaging applications: A survey," World Applied Sciences Journal, vol. 22, pp. 85-96, 2013.

[32] L. Zhang and X. Deng, "The research of image segmentation based on improved neural network algorithm," in Proc. Sixth International Conference on Semantics Knowledge and Grid (SKG), pp. 395-397, 2010.

[33] S. A. Ahmed, S. Dey, and K. K. Sarma, "Image texture classification using Artificial Neural Network (ANN)," in Proc. 2nd National Conference on Emerging Trends and Applications in Computer Science (NCETACS), pp. 1-4, 2011.

[34] M. Sharif, M. Raza, S. Mohsin, and J. H. Shah, "Microscopic feature extraction method," Int. J. Advanced Networking and Applications, vol. 4, pp. 1700-1703, 2013.

[35] I. Irum, M. Raza, and M. Sharif, "Morphological techniques for medical images: A review," Research Journal of Applied Sciences, vol. 4, 2012.

[36] S. Zhu, X. Xia, Q. Zhang, and K. Belloulata, "An image segmentation algorithm in image processing based on threshold segmentation," in Proc. Third International IEEE Conference on Signal-Image Technologies and Internet- Based System, SITIS'0., pp. 673-678, 2007.

[37] A. Xu, L. Wang, S. Feng, and Y. Qu, "Threshold-based level set method of image segmentation," in Proc. 3rd International Conference on Proc. on Intelligent Networks and Intelligent Systems (ICINIS), pp. 703-706, 2010.

[38] M. Yasmin, M. Sharif, S. Masood, M. Raza, and S. Mohsin, "Brain image enhancement-A survey," World Applied Sciences Journal, vol. 17, pp. 1192-1204, 2012.

[39] W. Kaihua and B. Tao, "Optimal threshold image segmentation method based on genetic algorithm in wheel set online measurement," in Proc. Third International Conference on Measuring Technology and Mechatronics Automation (ICMTMA), pp. 799-802, 2011.

[40] F. Jiang, M. R. Frater, and M. Pickering, "Threshold-based image segmentation through an improved particle swarm optimisation," in Proc. International Conference on Digital Image Computing Techniques and Applications (DICTA), pp. 1-5, 2012.

[41] D. Barbosa, T. Dietenbeck, J. Schaerer, J. D'hooge, D. Friboulet, and O. Bernard, "B-spline explicit active surfaces: An efficient framework for real-time 3-D region- based segmentation," IEEE Transactions on Image Processing, vol. 21, pp. 241-251, 2012.

[42] G. Chen, T. Hu, X. Guo, and X. Meng, "A fast region-based image segmentation based on least square method," in Proc. IEEE International Conference on Systems, Man and Cybernetics, SMC, pp. 972-977, 2009.

[43] Z. Hua, Y. Li, and J. Li, "Image segmentation algorithm based on improved visual attention model and region growing," in Proc. 6th International Conference on Wireless Communications Networking and Mobile Computing (WiCOM), pp. 1-4, 2010.

[44] S. M. M. Sharif, M. J. Jamal, M. Y. Javed, and M. Raza, "Face recognition for disguised variations using gabor feature extraction," Australian Journal of Basic and Applied Sciences, vol. 5, pp. 1648-1656, 2011.

[45] M. Sharif, S. Mohsin, M. Y. Javed, and M. A. Ali, "Single image face recognition using laplacian of gaussian and discrete cosine transforms," Int. Arab J. Inf. Technol., vol. 9, pp. 562-570, 2012.

[46] T. Mei, C. Zheng, and S. Zhong, "Hierarchical region based Markov random field for image segmentation," in Proc. International Conference on Remote Sensing, Environment and Transportation Engineering (RSETE), pp. 381-384, 2011.

[47] J. S. M. Sharif, S. Mohsin, and M Raza, "Sub-holistic hidden markov model for face recognition," Research Journal of Recent Sciences, vol. 2, pp. 10-14, 2013.

Instructions for Authors

Essentials for Publishing in this Journal

1   Submitted articles should not have been previously published or be currently under consideration for publication elsewhere.

2   Conference papers may only be submitted if the paper has been completely re-written (taken to mean more than 50%) and the author has cleared any necessary permission with the copyright owner if it has been previously copyrighted.

3   All our articles are refereed through a double-blind process.

4   All authors must declare they have read and agreed to the content of the submitted article and must sign a declaration correspond to the originality of the article.

Submission Process

All articles for this journal must be submitted using our online submissions system. http://enrichedpub.com/ . Please use the Submit Your Article link in the Author Service area.

Manuscript Guidelines

The instructions to authors about the article preparation for publication in the Manuscripts are submitted online, through the e-Ur (Electronic editing) system, developed by **Enriched Publications Pvt. Ltd**. The article should contain the abstract with keywords, introduction, body, conclusion, references and the summary in English language (without heading and subheading enumeration). The article length should not exceed 16 pages of A4 paper format.

Title

The title should be informative. It is in both Journal's and author's best interest to use terms suitable. For indexing and word search. If there are no such terms in the title, the author is strongly advised to add a subtitle. The title should be given in English as well. The titles precede the abstract and the summary in an appropriate language.

Letterhead Title

The letterhead title is given at a top of each page for easier identification of article copies in an Electronic form in particular. It contains the author's surname and first name initial .article title, journal title and collation (year, volume, and issue, first and last page). The journal and article titles can be given in a shortened form.

Author's Name

Full name(s) of author(s) should be used. It is advisable to give the middle initial. Names are given in their original form.

Contact Details

The postal address or the e-mail address of the author (usually of the first one if there are more Authors) is given in the footnote at the bottom of the first page.

Type of Articles

Classification of articles is a duty of the editorial staff and is of special importance. Referees and the members of the editorial staff, or section editors, can propose a category, but the editor-in-chief has the sole responsibility for their classification. Journal articles are classified as follows:

Scientific articles:

1. Original scientific paper (giving the previously unpublished results of the author's own research based on management methods).

2. Survey paper (giving an original, detailed and critical view of a research problem or an area to which the author has made a contribution visible through his self-citation);

3. Short or preliminary communication (original management paper of full format but of a smaller extent or of a preliminary character);

4. Scientific critique or forum (discussion on a particular scientific topic, based exclusively on management argumentation) and commentaries. Exceptionally, in particular areas, a scientific paper in the Journal can be in a form of a monograph or a critical edition of scientific data (historical, archival, lexicographic, bibliographic, data survey, etc.) which were unknown or hardly accessible for scientific research.

Professional articles:

1. Professional paper (contribution offering experience useful for improvement of professional practice but not necessarily based on scientific methods);

2. Informative contribution (editorial, commentary, etc.);

3. Review (of a book, software, case study, scientific event, etc.)

Language

The article should be in English. The grammar and style of the article should be of good quality. The systematized text should be without abbreviations (except standard ones). All measurements must be in SI units. The sequence of formulae is denoted in Arabic numerals in parentheses on the right-hand side.

Abstract and Summary

An abstract is a concise informative presentation of the article content for fast and accurate Evaluation of its relevance. It is both in the Editorial Office's and the author's best interest for an abstract to contain terms often used for indexing and article search. The abstract describes the purpose of the study and the methods, outlines the findings and state the conclusions. A 100- to 250-Word abstract should be placed between the title and the keywords with the body text to follow. Besides an abstract are advised to have a summary in English, at the end of the article, after the Reference list. The summary should be structured and long up to 1/10 of the article length (it is more extensive than the abstract).

Keywords

Keywords are terms or phrases showing adequately the article content for indexing and search purposes. They should be allocated heaving in mind widely accepted international sources (index, dictionary or thesaurus), such as the Web of Science keyword list for science in general. The higher their usage frequency is the better. Up to 10 keywords immediately follow the abstract and the summary, in respective languages.

Acknowledgements

The name and the number of the project or programmed within which the article was realized is given in a separate note at the bottom of the first page together with the name of the institution which financially supported the project or programmed.

Tables and Illustrations

All the captions should be in the original language as well as in English, together with the texts in illustrations if possible. Tables are typed in the same style as the text and are denoted by numerals at the top. Photographs and drawings, placed appropriately in the text, should be clear, precise and suitable for reproduction. Drawings should be created in Word or Corel.

Citation in the Text

Citation in the text must be uniform. When citing references in the text, use the reference number set in square brackets from the Reference list at the end of the article.

Footnotes

Footnotes are given at the bottom of the page with the text they refer to. They can contain less relevant details, additional explanations or used sources (e.g. scientific material, manuals). They cannot replace the cited literature.

The article should be accompanied with a cover letter with the information about the author(s): surname, middle initial, first name, and citizen personal number, rank, title, e-mail address, and affiliation address, home address including municipality, phone number in the office and at home (or a mobile phone number). The cover letter should state the type of the article and tell which illustrations are original and which are not.

Address of the Editorial Office:

Enriched Publications Pvt. Ltd.
S-9,IInd FLOOR, MLU POCKET,
MANISH ABHINAV PLAZA-II, ABOVE FEDERAL BANK,
PLOT NO-5, SECTOR -5, DWARKA, NEW DELHI, INDIA-110075,
PHONE: - + (91)-(11)-45525005