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## Forensic Activity Logger: Harvesting Data From Mobile Devices

Ms. K Devi Dhana Lakshmi, Mr. JV Rama Kumar, Mr. GSVR Abhishek,

### Abstract—

*Nowadays, mobile devices have become one of the most popular instruments used by a person on its regular life, mainly due to the importance of their applications. In that context, mobile devices store user's personal information and even more data, becoming a personal tracker for daily activities that provides important information about the user. Derived from this gathering of information, many tools are available to use on mobile devices, with the restraint that each tool only provides isolated information about a specific application or activity. Therefore, the present work proposes a tool that allows investigators to obtain a complete report and timeline of the activities that were performed on the device. This report incorporates the information provided by many sources into a unique set of data. Also, by means of an example, it is presented the operation of the solution, which shows the feasibility in the use of this tool and shows the way in which investigators have to apply the tool.*

**Keywords**—forensics; tool; register; activity; mobile; smartphone; Android

### INTRODUCTION

Nowadays, mobile devices are used for a wide spread of tasks (e.g., entertainment, education, communication, socialization, research, commercial transactions). As a result of said use, the devices store information related to the user's behaviour. Therefore, they constitute an important source of evidence for forensics analysis [1]. Also, the forensics analysis uses a set of techniques that allow the collection and extraction of information from different devices without altering their original state [2]. For example, it can recover deleted files, browsing history, instant messaging information, login data, among others, all these types of information are known as digital evidence. According to Orio et al., [3], there are three aspects that should be considered during the forensics analysis: I) avoid contamination of the evidence to prevent misinterpretations; ii) act methodically, that is, all the results of the forensics process must be well documented; and iii) control the chain of custody through the use of a protocol. Also, there are legal aspects to take into consideration when performing a forensics investigation, that do not comply always, these leads to the misuse of applications, fraud, theft, dissemination of

copyrighted materials, etc. Thus, according to Taylor et al., [4] it is necessary to follow all the legal guidelines corresponding to the jurisdiction where the conflict is generated, to avoid undue exposure of personal information. Also, there are a variety of applications (e.g., Encase, DFF, FTK, Helix, Oxygen, MOBIL Edit, UFED), which are used for forensic analysis and allow the inspection of various elements of mobile devices (e.g., internal memory, applications, messages). Now, the so-called suites take all the previous points and join them in a single analysis creating a powerful and useful tool [5]. Also, it is important to take into account that there are advantages of using open-source tools for forensics analysis during an investigation (e.g., no-cost, easy to examine in court, allows verification) [6]. But commercial tools are also used because they provide a great variety of alternatives for analysis [6]. In Yadav et al., [7] it is presented a comparison among six commercial and open-source applications. Those tools perform processes such as: recovering, performing keyword searches, recovering cookies, creating forensic images and locating partitions of the digital devices.

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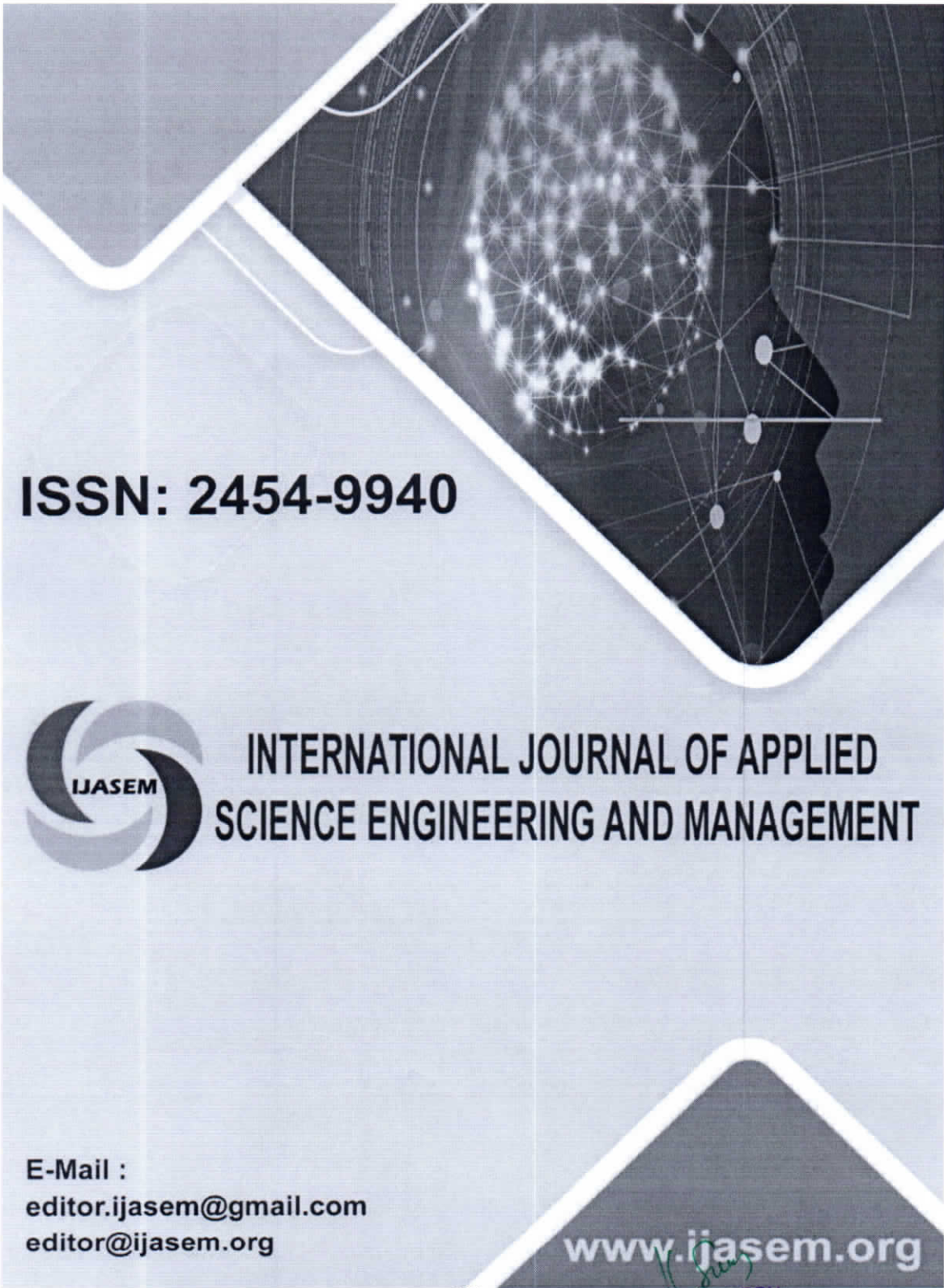
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## Antenna for Wireless Communication: Design and Analysis of a Micro Strip Patch Antenna

Satya Durga Anvesh P, A B S R Manohar, J S S Ramaraju,

### Abstract:

*It is critical that the microstrip antenna used for wideband communication be lightweight, easy to build, and small in size in order to be effective. A basic geometrically organised design for the microstrip antenna is required in the present context in order to achieve appropriate broadband performance. Presented here are the findings from a two-dimensional design study of rectangular and square shaped microstrip antennas conducted by the author. In order to feed both antennas, microstrip line was used in conjunction with each antenna. When compared to the rectangular microstrip antenna used in the preceding example, the square-shaped microstrip antenna provides a wider bandwidth and a more acceptable return loss. Small and lightweight, the small antenna is intended to function in the X band of frequencies, where it will be most effective. According to the results of the antenna performance evaluations, the proposed microstrip antenna has a wide bandwidth of 500MHz, and a considerable return loss (-24 dB). Because of its huge bandwidth, it may be used in a wide variety of wideband applications in the X- band spectrum.*

*Index Terms: Broadband, Microstrip Antenna, Reflection coefficient, Stub Matching.*

### I. INTRODUCTION

The usage of a Microstrip antenna is a significant advancement in wireless communication systems because it satisfies the needs of the most recent generation of wireless communication technology, which is distinguished by its ability to introduce new concepts and ideas. It is being employed in each of these devices owing to the several benefits [1] that microstrip antennas provide, including the fact that they are incredibly lightweight, have a basic construction, and are highly efficient while being inexpensive. In contrast, the limited operating bandwidth of it is a restriction, and as a consequence, its usage in wireless systems is severely constrained [2]. We have grown to rely on broadband programmes that perform a range of tasks as well as wireless gadgets as crucial components of our day-to-day life. As a consequence, the need for low-profile wideband has been decreased [3] as a result of this

development. As well as being able to fulfil the great majority of the requirements for mobile and satellite equipment, microstrip antennas are also capable of addressing an extensive variety of business demands. When it comes to wireless applications, the quantity of electrical circuits required is gradually decreasing, making the microstrip a particularly appropriate match in this case. Additionally, the size of the antennas that are used for the overwhelming majority of applications is shrinking at a frighteningly fast pace. Design of a microstrip antenna fix that satisfies the specifications of these Multiple methodologies have been examined [4-6], and it has been shown that the selection of the appropriate impedance bandwidth of the microstrip antenna may be one of the variables leading to the enhancement of performance. Notches have been shown to elicit craving responses [7,8].

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# SUPPORT VECTOR MACHINES, A BI-OBJECTIVE HYPER-HEURISTIC, FOR THE CYBER-SAFETY OF LARGE DATA SETS

Mr. D Srikar, Mr. USV Vinod, Mr. JV Rama Kumar,

## ABSTRACT

*Is a major issue, and that this fact poses a significant challenge to the academic community. In order to deal with the security issues that come with large data, machine learning techniques have been proposed as a possible solution. Support vector machines (SVMs) have been one of the most popular of these methods. Obtained impressive results on a wide range of classification tasks. However, in order to set up an efficient SVM, the user must first define the appropriate SVM configuration in advance—a difficult operation that calls for specialized expertise and a great deal of trial and error. Here, we provide a formalization of the SVM configuration procedure as a bi-objective optimization problem, with accuracy and model complexity as two competing goals. New problem-domain-agnostic hyper-heuristic framework for bi-objective optimization is proposed. The first ever hyper-heuristic for this issue has been created just now. To solve this problem, the authors suggest a hyper-heuristic framework that combines both high-level strategy and heuristics. The search performance is utilized by the high-level approach to determine which of many possible low-level heuristics should be used to produce a new SVM configuration. Each of the low-level algorithms takes a unique approach to successfully searching the space of possible SVM configurations. The proposed framework adaptively combines the benefits of decomposition- and Pareto-based techniques to approximate the Pareto set of SVM configurations, allowing it to tackle the problem of bi-objective optimization. Two cyber security challenges, Microsoft malware big data classification and anomalous intrusion detection, were used to assess the performance of the suggested system. In comparison to its contemporaries and other algorithms, the acquired results show that the suggested framework is very successful.*

## I. INTRODUCTION

Rapid progress in areas like mobile, social and the Internet of Things results in an explosion of data in digital form. Big has special meaning in this setting. Data has arisen to characterize these enormous stores of digital information. Big data is defined as "very big and complicated datasets with both structured and Unstructured data that are created on a regular basis and need analysis in a very short period of time" [49]. Huge data, as contrast to the big database, refers to data sets that are either too large, change too rapidly, or are too complex to be processed by conventional methods. Three criteria often used to define big data are scale, diversity, and speed (aka 3Vs). The 3Vs are the attributes or dimensions of data, with volume referring to the sheer bulk of the data, variety

indicating that the data came from a wide range of sources, and velocity referring to the swiftness with which new data may be created, streamed, and aggregated [49]. The growth of all three features (3Vs), not simply the volume alone, is primarily responsible for the complexity and difficulty posed by big data [14]. Researchers, analysts, and business users may all benefit from the speedier, more informed judgments made possible by big data [38]. Researchers and practitioners from a wide range of groups, including academia, business, and government organizations, have focused on this led because of its practical applications and problems [14].

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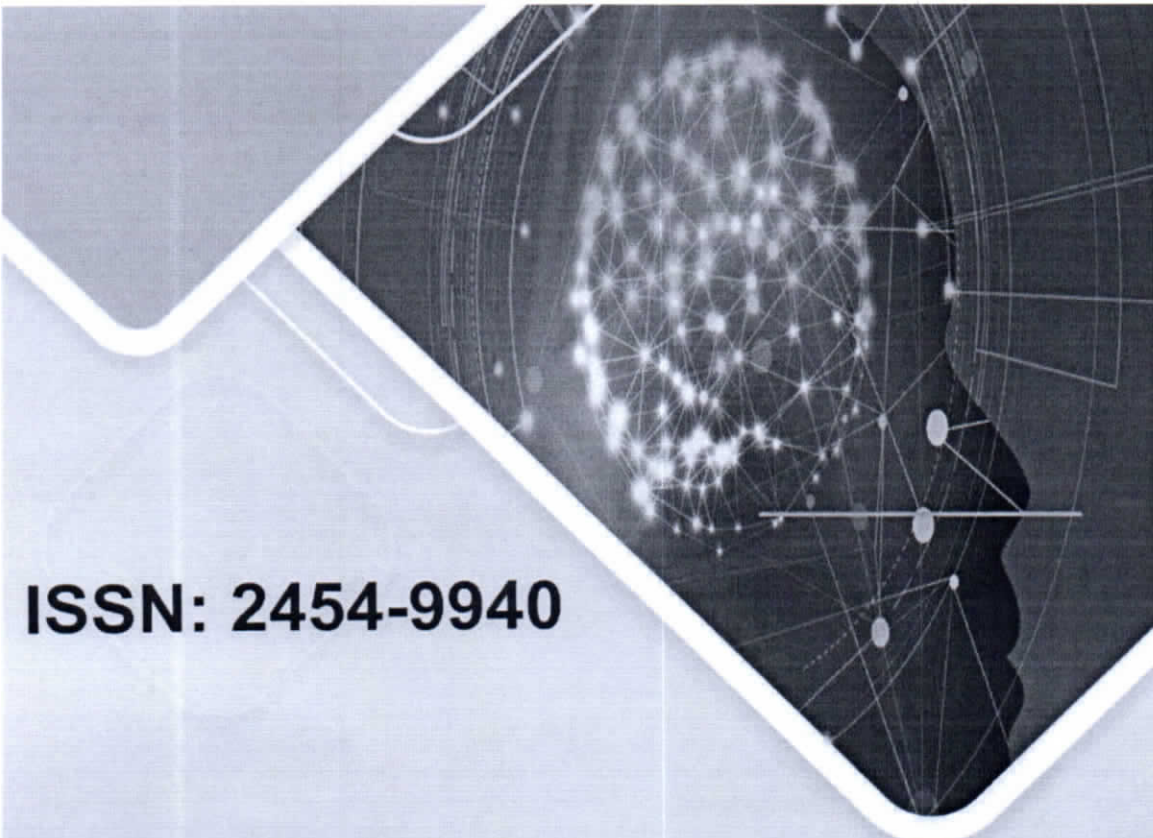
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## Power grid emergency communication network design considering several networks

Mahesh Gudivaka, Satya Durga Anvesh P, J S S Ramaraju,

### Abstract.

Natural disasters and emergencies generally pose serious threats to power facilities. Therefore, it is necessary to establish an efficient electric power emergency communication (EPEC) system. Existing systems based on a single network carrier (for example, 4G, satellite, and Wi-Fi) may not meet the requirements of complex environments. We design a new EPEC system based on multi-network convergence technology by integrating the above three network carriers. It overcomes the limitations of single network carrier and improves the efficiency of power emergency communication. The test results show that the system can improve the transmission line bandwidth, automatically switch to the optimal signal network, and guarantee the security and stability of data transmission.

### 1.Introduction

Natural disasters and emergencies have caused huge threats and damages to power facilities [1], and there is an urgent need to establish a power emergency communication system that responds quickly to power emergencies and can efficiently interact. The current plan mainly uses a single communication network such as 4G, satellite communication [2] and Wi-Fi as the carrier, which is suitable for different application scenarios. 4G has a wide coverage area and low cost. Communication systems using 4G as a carrier are widely used in urban public power management. Satellite communication has a wide coverage area, stable and reliable signals, and systems based on satellite communication are widely used in large-scale power management. Wi-Fi is easy to operate, and systems based on Wi-Fi are widely used in household power management. In order to cope with the complex and changeable power emergency communication problems in the field environment,

this article adopts multi-network integration technology to achieve the integration of the above three network carriers, realize multi-network simultaneous transmission and automatically switch to the network with the best signal, to ensure effective power emergency Communication.

### 2. Power emergency communication system requirements based on multi-network integration

Different communication carriers have certain shortcomings. The electric emergency communication system with a single network as the carrier cannot carry out efficient and reliable communication in a complex and changeable environment. Wi-Fi cannot carry out large-scale and long-distance communication [3]; 4G has

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# Methods for Detecting Fake Profiles in Online Social Networks Using Artificial Neural Networks

Mr. JV Rama Kumar, Dr. Suresh Kopparthi, Mr. D Srikar,

## Abstract

*In light of the current situation, most individuals are participating in online social networks. Everyone, from kids to adults, spends a lot of time on these sites, either learning new things or getting in touch with friends and family in more effective ways. However, today's social media platforms are plagued by a large number of bogus accounts that exploit security flaws in order to steal from the sites or commit cybercrimes themselves.*

## Keywords:

Support Vector Machine (SVM), K-Nearest Neighbours (KNN), Naive Bayes, and Decision Tree (SVM)

## 1. Introduction


In the context of computer security, the term "malware" is used to describe any malicious programme. One of the biggest security concerns with the rapid development of technology is malicious software [1]. Malware, or malicious software, refers to any software created with the intention of causing damage to a computer system by means such as stealing data or spying on its users. Depending on their intended damage or behaviour, malicious programmes like Trojans, viruses, rootkits, worms, and spyware fall under one of many categories [13]. With a growing family of malicious software, anti-virus scanners are unable to keep up, since millions of pieces of software are still vulnerable. Kaspersky Lab estimates that there were 5,638,828 unique hosts compromised in 2018 [1]. More than 33 billion records will be taken by thieves in 2023, according to another study by Juniper Research [2]. These days, it's not easy to spot malware since hackers may use any number of techniques they find online.

Moreover, the widespread availability of anti-detection techniques allows anybody to launch an attack or create malicious software without needing any special training or expertise. Furthermore, attackers are using techniques that need them to swiftly update to a newer version in order to evade detection. In light of the fact that even a single malware attack may cause significant harm to data and catastrophic losses, protecting computer systems is one of the most essential jobs for consumers and enterprises. Due to massive amounts of money being lost and the prevalence of assaults, effective and trustworthy methods of detection are essential. There are two main types of malware detection: static analysis, which involves analysing a compiled file or programme, and dynamic analysis, which involves analysing the behaviour of the programme while it is running, including things like how much power it uses, how much memory it accesses, and how much of the device's network it uses [2].

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## Applying the discrete cosine transform to improve the contrast of grayscale images

R Mani Deepika, Mahesh Gudivaka, A B S R Manohar,

### ABSTRACT:

*This study introduces and applies the novel discrete cosine transform-based approach for contrast enhancement. The process converts the original image into the DCT domain, adjusts the coefficients of the DCT using a proposed mask, and then reconstructs the improved image using inverse DCT. When the PSNR values are higher and the image quality is better, the discrete cosine transform performs better. This method is contrasted with the improvement method based on the discrete wavelet transform.*

### INTRODUCTION

Image Contrast Enhancement process enhances images quality in which features are hardly detectable by eye. It improves the visualization of features of image. Basically, contrast is developed due to luminance reflected by two surfaces. In satellite, medical field the contrast enhancement techniques are used to enhance the images brightness and contrast. Histogram equalization is one the most well-known method for contrast enhancement. This approach generally useful for images with poor intensity distribution. By enhancing edges in image enhances the contrast. Multi scale edge enhancement approach, takes all resolution levels into account MSR softens the strongest edges and keeps the faint edges almost untouched. The strategies are different, but methods allow the user to see details which were hardly distinguishable in the original image, by

reducing the ratio of strong features to faint features. The wavelet approach consists of first transforming the image using the dyadic wavelet transform. Then the two wavelet coefficients relative to the horizontal and vertical wavelet bands are modified by multiplying by constant at scale and at pixel position. Finally, the enhanced image is obtained by the inverse wavelet transform from the modified wavelet coefficients. Wavelet bases present some limitations, because they are not well adapted to the detection of highly anisotropic elements, such as alignments in an image, or sheets in a cube. In DCT approach by modifying DCT coefficients of sub images can enhance the image properly

### OVERVIEW OF DWT AND DCT

In this paper, discrete cosine transform for enhancing the gray image has been proposed and compared with discrete wavelet transform

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## Reactions to the COVID 19 vaccine: detecting and describing them

Mr. USV Vinod, Mr. GSVR Abhishek, Dr. Suresh Kopparthi,

### Abstract

Many nations have made significant efforts, including vaccine development, to combat the spread of COVID-19. This publication aimed to provide a comprehensive review of COVID-19 vaccines, including their history, current uses, and potential pitfalls. This article surveyed previous attempts to track the evolution of the COVID-19 immunogen.

### 1. INTRODUCTION

In a first for 2019, on December 31st, China announced the onset of a new corona virus illness caused by the severe acute respiratory syndrome corona virus type 2 (SARS-CoV-2).

The World Health Organization (WHO) will hold its

On February 11, 2019, the World Health Organization (WHO) officially designated the new corona virus pneumonia outbreak Corona virus illness 2019. (COVID-19).

The global pandemic influenza A (COVID-19) had catastrophic effects on almost every nation. Even in moderate instances and asymptomatic infections, the new corona virus is very infectious and spreads rapidly. The potential for "hidden" transmission in public spaces and hospitals is high.

At some point, the virus might morph into a mild seasonal pandemic.

Due to the broad vulnerability of the population, it is unknown how the virus is transmitted from the host to the individual even if the infection is eradicated. A recurrence of the disease is possible, as are recurring outbreaks. Vaccines must be given as soon as humanly practical. There are about 7.8

billion individuals on the planet who might get infected with SARSCoV-2 or experience the devastating effects of COVID-19. To stop the spread of COVID-19 and ensure that it doesn't happen again, scientists are eagerly awaiting the creation of a safe and effective vaccine. The World Health Organization (WHO) now lists over 200 COVID-19 vaccines as being under development. High hopes are placed on preventative COVID-19 vaccinations. In 2021, three vaccines may be available on the market if they have been shown to be efficacious and safe in late-stage clinical testing. Several vaccines, including BNT162b2 from Pfizer-BioNTech and mRNA-1273 from Moderna, have been given the green light for commercial release.

### 2. METHODOLOGY

Both humoral and cellular immunity must be considered in the development of COVID-19 vaccines. Since COVID-19 is transmitted mostly via the respiratory system and direct touch, more attention should be made to the function of mucosal immunity in warding off viral infections.

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## Growth of communication-related optical-fiber-monitoring technologies

J S S Ramaraju, Mahesh Gudivaka, R Mani Deepika,

### Abstract

*Due to its high data rate and capacity to transfer data over long distances, fibre optic technology has dominated the industry. It has been established that fibre optics is a far better technology over metal wires. Fiber optics are less susceptible to interference and have lower signal loss. Optical fibres can be employed in light transmission applications as they are waveguides. The optical fibre core is encased in an outer layer of glass or plastic that has a lower refractive index than the fibre core. To accomplish fine confinement of light within the waveguide, the entire internal reflection phenomenon is required. Most telecommunications networks employ fibre optics as their primary method of data transfer. (1) Chalcogenide glasses, fluor aluminate crystalline minerals, and fluor zirconate are used to make today's fibres.*

**KEYWORDS:** Fiber optics, silica, chalcogenide, fluor aluminate

### INTRODUCTION

Light pulses are sent over an optical fibre to transfer data from one point to another in fibre-optic communications. It's preferred to use fibre over electrical cabling when you need a high bandwidth, lengthy distance, or electromagnetic interference resistance. A local area network, a computer network or long distances can send voice, video, and telemetry utilizing this form of communication. Many telecommunications providers use optical fibre to deliver phone and Internet transmissions, as well as cable television signals. Using fibre-optic communication, Bell Labs researchers were able to achieve internet speeds of over 100 Peta bits per second on communication, fibre optics requires the following steps: To produce an optical signal from an electrical signal using a transmitter. An optical signal is obtained 4 Fibre optic transmission has several advantages, as stated below.

Fiber has a very high bandwidth compared to any other cable-based data transmission technology. Copper wires transfer less data per second than fibre optic connections. Distance: Optical cables have minimal power loss, allowing for greater signal transmission lengths compared to copper cables There is no way to prevent electromagnetic interference when working in the field. For this reason, fibre has an extremely low bit error rate (10 EXP-13). Fibre optic data transmission is virtually noiseless. In fibre optic transmission, light is used to transmit data or signals. As a result, by "listening in" to the electromagnetic energy "leaking" via the wire, there is no way to discover the data being communicated, ensuring absolute information security. Fiber optic cable has a very small diameter, which makes it ideal for use in small spaces. A single

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# The Use of a Decision Tree Algorithm for Classification Purposes in Foretelling the Occurrence of Crime

Dr. Suresh Kopparthi, Mr. USV Vinod, Mr. GSVR Abhishek,

## Abstract—

*The crime rate has skyrocketed in the preceding several years. The occurrence of crime is a widespread societal issue that has a negative impact on both living conditions and economic development. As crime rates rise, police departments have a growing need for cutting-edge technology and fresh strategies to enhance crime analytics and strengthen public safety. The use of a decision tree (J48) in the context of law enforcement and intelligence analysis shows promise in mitigating this issue. Data mining is an AI-based technique for gaining insight from big data sets by uncovering previously unknown connections between variables. Decision tree (J48) is one such AI technique. Machine learning is a significant area of study because of its many potential applications. It's no secret that criminology is a prime area for data mining applications. In order to better understand crime, criminologists use a systematic approach called criminology. According to the reviewed literature, the decision tree (J48) algorithm is the most effective machine learning algorithm for prediction of crime data, hence it was chosen for the construction of the study's prototype model of crime prediction. According to the findings of the experiments, the J48 algorithm was able to forecast the unknown category of crime data with an accuracy of 94.25287%, which is good enough for the system to be depended on for the prediction of future crimes.*

## Keywords:

artificial intelligence; classification algorithms; decision tree; J48; crime prediction.

## INTRODUCTION


Crime is a widespread societal issue that has a negative impact on both individual well-being and national prosperity [1]. One of the most important factors in deciding whether or not to relocate to a new city and whether or not to visit certain areas [2]. Fear among the populace damages the sense of community, social connections are broken when people avoid specific areas out of habit, people stop venturing out at night, and the town's reputation suffers as a result of crime. People may avoid visiting or even relocate from a neighbourhood if they believe it has a high crime rate. The economy suffers as a result. There are both concrete costs, such as increased demand for police, courts, and correctional facilities, and intangible costs, such as the emotional toll taken on crime victims and the decline in their standard of living. Increasing crime rates are a major issue in many nations nowadays. Actually, researchers are analysing criminals and their actions to learn more about crime and its

causes. Since the volume of crime data is growing at an exponential rate, it might provide serious storage and processing challenges. Choosing reliable methods for data analysis is especially challenging because of the inconsistent and inadequate nature of such information. Researchers are prompted to study this data set because of the need to improve crime data analysis. The exponential growth of crime data

makes it difficult to store and analyse, among other issues. As a result of the data's inherent inconsistency and insufficiency, questions emerge about the best way to choose appropriate methods for data analysis. To better understand and analyse crime, scientists are motivated to study these sorts of data [3]. The purpose of this study is to use an appropriate machine learning algorithm on crime data in order to forecast whether or not a county would have a low, medium, or high rate of violent crimes.

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## Techniques for equalizing channels to reduce symbol interference in wireless systems

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### Abstract:

*Time delays and symbol interference are now the biggest problems in wireless communications. Various adaptive equalisation strategies are used as a means of resolving this issue. The goal of the equalisation method is to reduce the inter-symbol interference caused by the temporal dispersion provided by the communication channel (ISI). For the receiver to function properly, some kind of blind equalisation must be implemented. During transmission, a blind equaliser makes estimates of both the broadcast signal and the channel characteristics, and these estimates might fluctuate over time. The purpose of this paper is to compare and contrast the symbol error rate and convergence speed of a number of different adaptive filter algorithms for blind channel and non-blind channel equalisation, including the Least Mean Square (LMS) algorithm equaliser, the Constant Modulus Algorithm (CMA) equaliser, and the Recursive Least Mean Square (RLS) algorithm equaliser. As a modulation method, we use Quadrature Phase Shift Keying (QPSK) and 16-Quadrature Amplitude Modulation (16-QAM). The staff of ijrei.com. No permission is being granted at this time.*

### Keywords:

Recursive Least Squares, Constant Modulus Algorithm, and Adaptive Equalizers

### Introduction

Inter-symbol interference (ISI) refers to a kind of signal distortion that occurs when one symbol causes distortion to successive symbols in a transmission [1]. This is a problem because the preceding symbol acts like noise and dilutes the clarity of the message. Symbol "fuzziness" due to ISI is often the consequence of multipath propagation or the channel's intrinsic nonlinear frequency response. Systemic ISI causes erroneous decisions to be made by the receiver of the device in question. As a result, the filter at both ends of the transmission is designed to dampen the ISI so that transmission mistakes are kept to a minimum. Adaptive equalisation and the raised cosine filter are two methods that may be used to combat inter-symbol interference. Channel equalising filter,

often known as a receiving equaliser, is a kind of filter used to mitigate distortion introduced by the transmission medium and the source device. Many equalisers exist for the purpose of reducing ISI [2]. Equalization, in its simplest form, is the process of adjusting the relative importance of different frequencies within an audio source. Filters using

constant coefficients need strict guidelines for their implementation. On the other hand, there are times when the requirements are either unavailable or change over time. That's why there's a technique called adaptive filtering, which uses time-varying coefficients to adjust to the ever-changing conditions it faces [3]. Since each operator primarily aims to meet the need for high data rate transmission

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