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3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

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3.	S.Senthipandi	Machine learning	2020-2021	978-93-91373-85-6	Shanlax publications, Madurai
4.	S.Senthipandi	Computer Networks	2020-2021	978-93-91373-66-5	Shanlax publications, Madurai
5.	C.Daniel	Impact of lockdown for research scholars	2020-2021	978-93-90853-50-2	International press
6.	Dr.K.S.Srinivasan	Wireless Sensor Networks	2020-2021	978-81-954927-4-9	Unique Pub International (UPI)
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10	Muhammad Irfan A	Evaluation of Performance and Emission Characteristics on Diesel Engine Fueled by Diesel- Algae Biodiesel Blend with Ignition Enhancing Additives	National Conference on IC Engines and Combustion	2020-2021	Springer
11	Senthil Kumar R	Multi-Response optimization of Iconel 825 Process Parameters Using LN2 Cooled Zinc-Coated Brass Wire in CNC Wire- Cut EDM	International Conference on Mechanical Engineering Design	2020-2021	Springer
12	Mrs. R. Sugunadevi	Smart Domestic Waste Segregator	International Virtual Conference on Emerging Frontiers in Control and Communication Technologies	2020-2021	Mohamed Sathak AJ College of Engineering, Chennai
13	Mrs. R. Sugunadevi	Battery Operated Iontophoresis for Hyperhidrosis and Cardiovascular Drug Delivery System	International Virtual Conference on Emerging Frontiers in Control and Communication Technologies	2020-2021	Mohamed Sathak AJ College of Engineering, Chennai
14	Mrs.E.Jayanthi	Design and Development of Dual Axis Controlled Writing Robot For Physically Crippled	4th international conference on Recent Trends in Science, Engineering & Management (ICRTSEM-2020)	2020-2021	Karpaga Vinayaga College of Engineering and Technology, Chennai
15	Dr.E.Dhiravidachelvi	Breast cancer Detection using KNN classifier	4th international conference on Recent Trends in Science, Engineering & Management (ICRTSEM-2020)	2020-2021	Karpaga Vinayaga College of Engineering and Technology, Chennai

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16	Mrs.Suganthi.I.S	Finger Vein Extraction Using Pnn Classifier	4th international conference on Recent Trends in Science, Engineering & Management (ICRTSEM-2020)	2020-2021	Karpaga Vinayaga College of Engineering and Technology, Chennai
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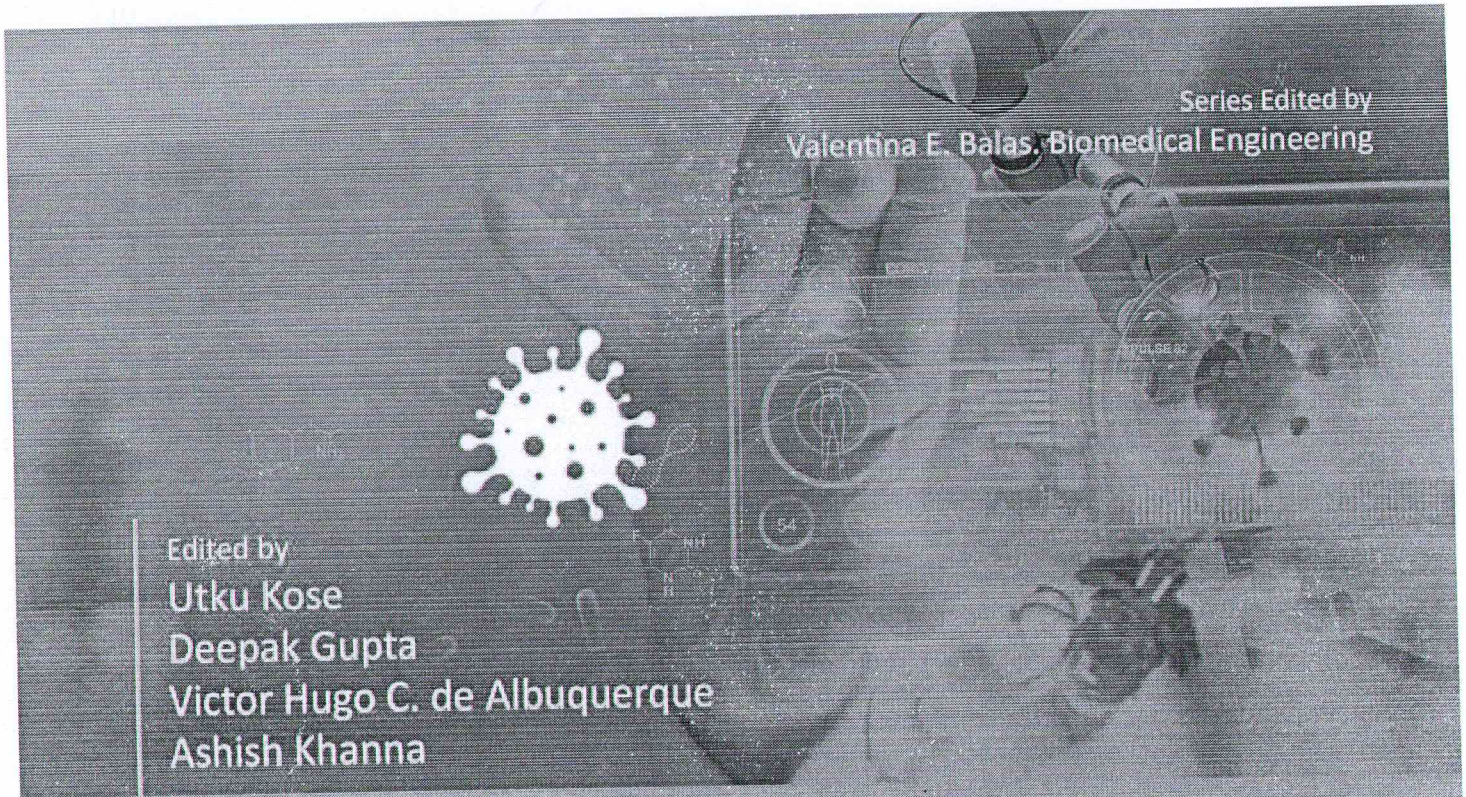

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Data Science for COVID-19

Volume One: Computational Perspectives

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Internet of Medical Things (IoMT) with machine learning–based COVID-19 diagnosis model using chest X-ray images

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1. Introduction

The standard testing model to predict coronavirus disease 2019 (COVID-19) is carried out by real reverse-transcription polymerase chain reaction (rRT-PCR) assay, a typical molecular-based assay that requires a long time to produce the desired outcome. Although the tool has been extensively applied, it depends on a well-trained laboratory and expert physicians, and it is time-consuming [1–5]. Because the COVID-19 outbreak is unmanageable, a great number of people's lives are at the dangerous point that has resulted in the breakdown of medical applications and global panic. Testing that relies on rRT-PCR is not applicable to managing the disease because COVID-19 has many asymptomatic cases [6].

Another option for COVID-19 diagnostic models is point-of-care (POC) tools that apply the lateral flow immunoassay (LFIA) method, mainly used to predicting COVID-19 in humans [7,8]. Immunoglobulin (Ig)G and IgM antibodies over severe acute respiratory syndrome (SARS)-CoV-2 might be predicted from human serum once COVID-19 is induced. The prediction stages of such antibodies offer data on the development and phases of viral infection. Because there are many virus-confirmed cases, various POC-LFIA tools have the ability to predict IgG and IgM levels, which facilitate them as

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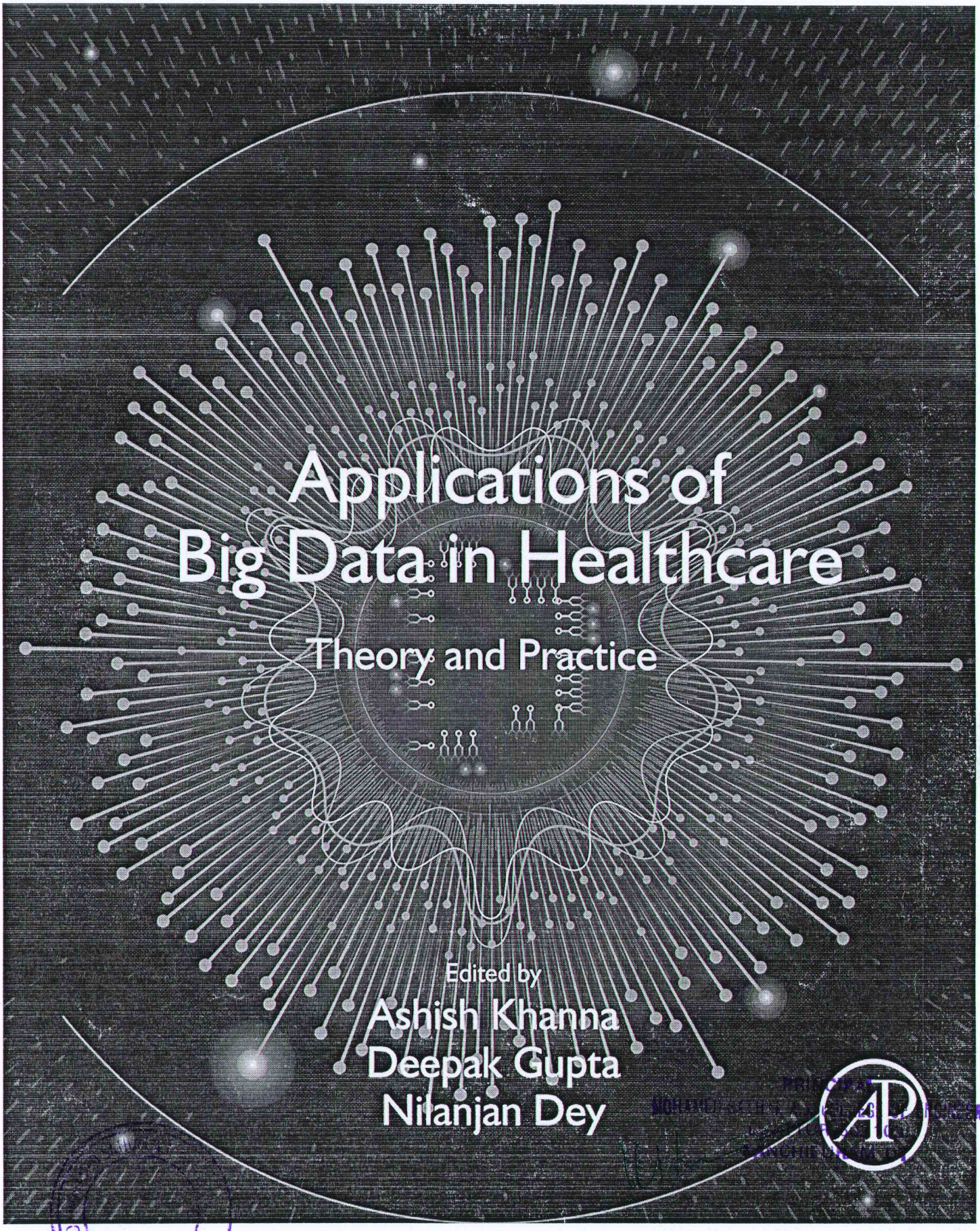
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10

Firefly—Binary Cuckoo Search Technique based heart disease prediction in Big Data Analytics

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Abstract

Nowadays, big data analysis is being given more attention in complex healthcare settings. Fetal growth curves, the classic case of big health data, are used to predict coronary heart disease. The proposed framework introduces the idea of summarizing large big data (inputs) in multidimensional scenarios in which known data mining methods such as preprocessing, optimal selection of features and forecasts are used. The dataset contains many random and variable values and can lead to incorrect results. Therefore, when dealing with these values, the utmost care is needed to obtain the best performance. Therefore, data creation before optimal function creation is processed using bacterial foraging optimization (BFO) before sample creation. It defines a multidimensional mining approach as a whole that addresses complex healthcare environments. This work aims to predict the risk of coronary heart disease (CAD) using machine learning algorithms such as Firefly—Binary Cuckoo Search (FFBCS). We also suggest a preliminary analysis of the performance of the framework.

Keywords: Coronary heart disease; preprocessing; bacterial foraging; Firefly; Binary Cuckoo Search

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MACHINE LEARNING

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MACHINE LEARNING

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We believe that intelligence comprehension involves understanding how information is obtained, represented, and stored; how intelligent behaviour is produced and learned; how motivations, emotional state, and goals are created and used; how sensory signals are converted into symbols; how symbols are manipulated to execute reasoning, to reason about the past, and to prepare for the future; We also believe that it would be a scientific achievement on the scale of nuclear physics, relativity, and molecular genetics to understand these functions at a fundamental level. We owe our deep sense of thanks to the management of SRM Institute of Science and Technology, Ramapuram Campus for their constant support and encouragement that enabled us to publish this book on time. Special thanks are due for a number of friends and colleagues in encouraging us to start the work and publish it. We sincerely express our thanks to our family members for their support and love without whom this book wouldn't be possible. We give thanks to Almighty God for his ever-present help and grace in compiling and completing this book on "Machine Learning".

Dr. A. Senthilselvi
Dr. Balika J Chelliah
Mr. S. Senthil Pandi

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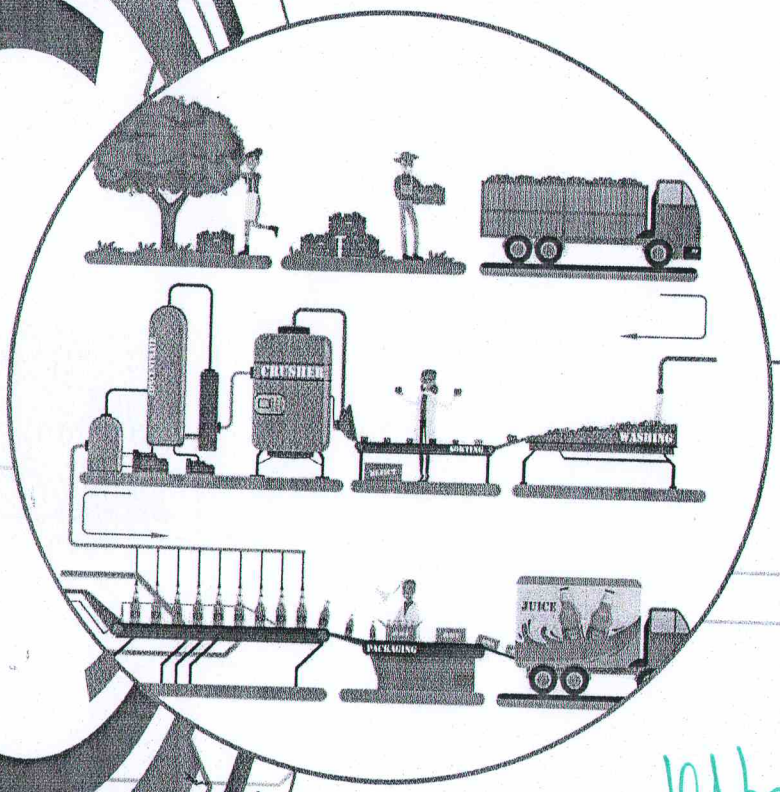

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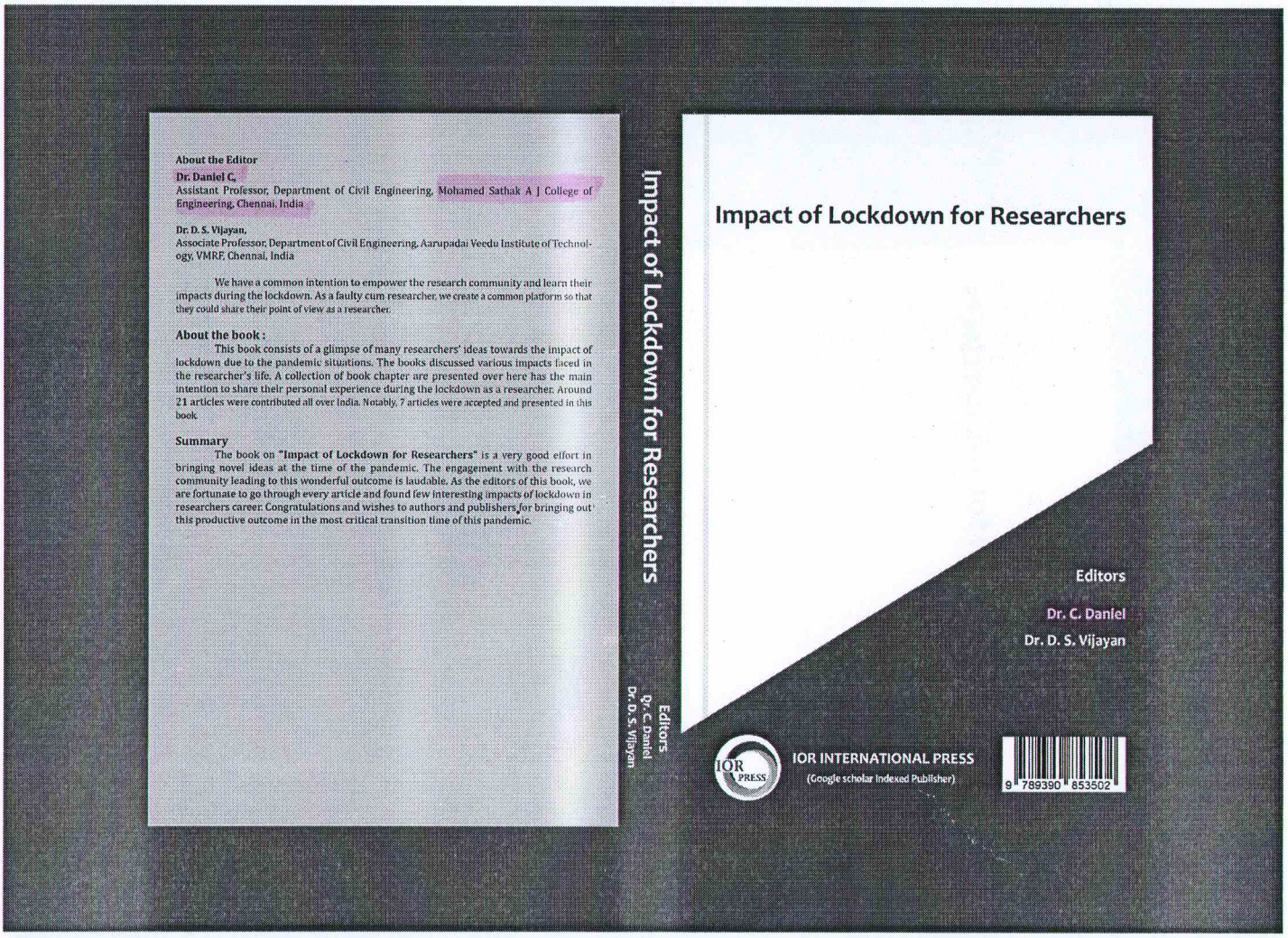

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We have a common intention to empower the research community and learn their impacts during the lockdown. As a faulty cum researcher, we create a common platform so that they could share their point of view as a researcher.

About the book :

This book consists of a glimpse of many researchers' ideas towards the impact of lockdown due to the pandemic situations. The books discussed various impacts faced in the researcher's life. A collection of book chapter are presented over here has the main intention to share their personal experience during the lockdown as a researcher. Around 21 articles were contributed all over India. Notably, 7 articles were accepted and presented in this book.

Summary

The book on **"Impact of Lockdown for Researchers"** is a very good effort in bringing novel ideas at the time of the pandemic. The engagement with the research community leading to this wonderful outcome is laudable. As the editors of this book, we are fortunate to go through every article and found few interesting impacts of lockdown in researchers career. Congratulations and wishes to authors and publishers for bringing out this productive outcome in the most critical transition time of this pandemic.

Impact of Lockdown for Researchers

Editors
Dr. C. Daniel
Dr. D. S. Vijayan

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Impact of Lockdown for Researchers

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Chapter 5
Impact of Lockdown for Research Scholars

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Abstract

This covid 19 pandemic affected many research scholar's life. Many researches not able to enter to their research lab. Their course work examination become virtual and their doctoral committee to thesis submission held in online. Many researchers undergo various challenges and this need a quick reform in future research guidelines. In this article the problems faced by the researchers is discussed and this will help the researchers to be ready for any pandemic occurs in future.

Keywords: lockdown, COVID-19, research scholars

Introduction

Research scholars during pandemic affected much without doing any kind of research, even though extension in PhD is available in many universities. Some research scholars are currently in the last year and they are undergoing many challenges in research. Many researcher scholars worried about their future. The covid 19 Lockdown also instigated encouraging changes in personal life of research scholars [1]. The impact of UG and PG students in universities is studied. An online questionnaire used to collect the information using google form [2]. In academia, there are many practical issues for the reading habits during COVID-19. On what frequency the academician is reading, why they are reading, from where academic staff are reading and how much time they are spending to read during lockdown [3]. The new SARS-CoV-2 coronavirus gave an alarm to many universities for virtual teaching

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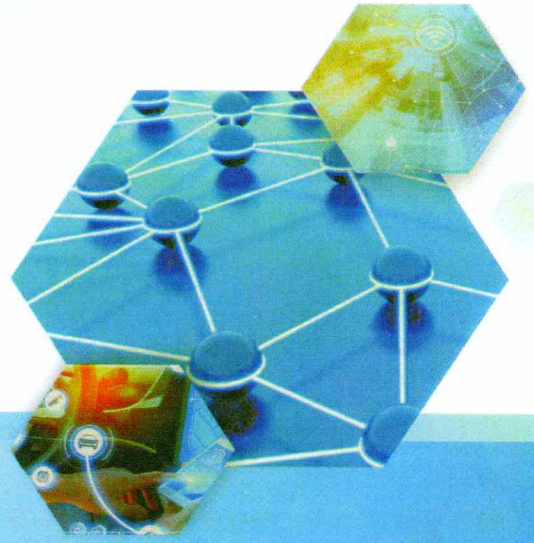

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WIRELESS SENSOR NETWORKS

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Micro-Electronics and Telecommunication Engineering

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Secured Library Access Through Face Recognition Integrated with RFID Technology

P. Anantha Prabha, S. A. Vighneshbalaji, M. Deva Priya, and R. Suguna Devi

Abstract Securing resources in the library is one of the prime concerns by preventing the entry of unauthorized users into the library. Saving time of users at entry/exit and circulation points is the next key concern. To access the library, the member is expected to swipe or scan his smart or IDentity (ID) card at the entry/exit point, and he/she is expected to wait at circulation points for the issue of books. In this system, members cannot access the library if they forgot to bring or miss their cards. Unauthorized persons can also easily enter into the library with stolen or duplicate ID cards. In order to secure and automate the library, a new system of accessing the library is proposed with deep learning and Radio-Frequency IDentification (RFID) technology. The proposed system focuses on automating the authentication of user with face recognition at the entry/exit point (turnstile) and providing them good user experience and automating the issue of books (RFID tagged) by using RFID detectors at the exit point. This system yields good results with our test datasets. Activation of this system at library premises ensures security and also facilitates auto checks-in and out, and thus saves users' valuable time.

Keywords Deep learning · Face recognition · Library · User experience · RFID

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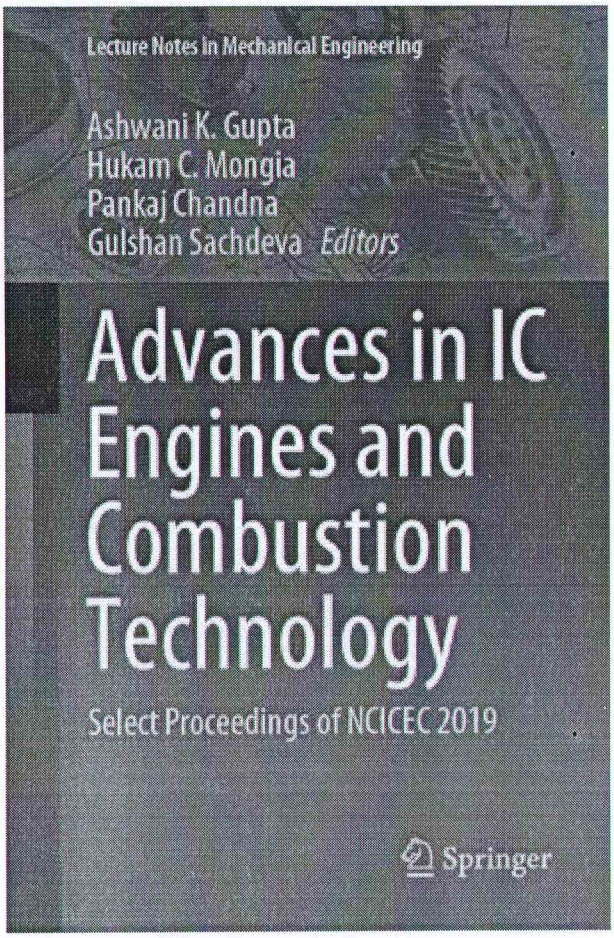

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Evaluation of Performance and Emission Characteristics on Diesel Engine Fueled by Diesel–Algae Biodiesel Blend with Ignition Enhancing Additives

A. Gurusamy, A. A. Muhammad Irfan, E. R. Sivakumar, and P. Purushothaman

Abbreviations

GHG	Greenhouse gas
BTE	Brake thermal efficiency
BSEC	Brake-specific energy consumption
KOH	Potassium hydroxide
UBHC	Unburned hydrocarbon
NO_x	Oxides of nitrogen
CO_2	Carbon dioxide
CO	Carbon monoxide
PD	Pure diesel
IC engine	Internal combustion engine

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1 Introduction

Significance of biofuels on the reduction of emission in IC engine is reviewed by Mofijur et al. [1], and they state that emission from on-road vehicle is basically accountable for health hazards and greenhouse gas (GHG) emission. The addition of biofuel (biodiesel and bioethanol) in IC engine is a feasible solution to reduce such emissions more than 80%. The use of biofuel in IC engine vehicle is mandatory for some developed countries; as an example, the USA needs to use 25% fermentation alcohol among 2020, Brazil has an intention to execute B20 among 2020 and India planned to use B10 throughout the nation among 2017.

The most acknowledged definition for third-generation biofuels is fuel that would be derived from algal biomass, which has an extremely distinctive growth yield as contrasted and traditional lignocellulosic biomass. The alga fuel is that the biofuel of the future will considerably decrease the necessity of fossil fuels and will facilitate to scale back the total quantity of harmful gases accountable for environmental issues [2]. Algae or microalgae produce the carbon content products and result in accumulation of lipid, as well as triacylglycerols (TAGs) using solar energy after that the biomass will be transformed into bio-alcohol and biodiesel. In comparison with the other feedstock, the microalgae grow up rapidly, are effortless to cultivate, need less attention and can exercise wastewater as nutrient for algae production. The further benefit of algae is a potential capture of GHG like CO_2 from atmosphere, which is produced by the power plants, driven by fossil fuels like coal-based thermal power plant [3]. Rastogi et al. [4] reviewed the progress of technological aspects, and the current trends going on the algae cultivation and process on production of biodiesel form the algae biomass. They reported that it is technically viable to cultivate algae in large scale for various usages, but it is a cost-effective concern with current technology.

1.1 Potential of Algae Biodiesel in IC Engine

Biodiesel derived from algae is the foremost economical choice in terms of using agriculture lands because it is not requiring terrestrial areas for cultivation of biomass and keeps away from competition with food crops. The benefits of biofuels produced from algae or microalgae over other source of alternative fuels are large quantities of neutral lipids/oil, grow at high rates, higher Oil yield per area, can be cultivated in saline/brackish water/coastal seawater on non-arable land and culture vessels (photo bioreactors), produce value-added co-products (biopolymers, proteins, polysaccharides, pigments, animal feed and fertilizer) [5]. Patel et al. [6] assess the performance and emission characteristics of diesel engine using algae methyl ester (Chlorella vulgaris) biodiesel blends (B10, B15 and B20) at different loads. They reported increase in BTE and NO_X (up to 36%) and reduction in BSEC, smoke, CO and HC emissions. Mwangi et al. [7, 8] conducted engine tests with biodiesel derived from

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Multi-response Optimization of Inconel 825 Process Parameters Using LN_2 Cooled Zinc-Coated Brass Wire in CNC Wire-Cut EDM

Midthur A. Salman Khan, C. Nandakumar, B. Mohan, and R. Senthil Kumar

Abstract Inconel 825 is a nickel-based superalloy which is mostly used in most of the industries where high corrosion resistance and high temperature withstanding are needed. Some of these industries are Petrochemical, Chemical, Missiles and Nuclear power plants. Inconel 825 has possessed high anti-oxidation nature even at high temperatures, i.e. about 650–760 °C. Inconel 825 cannot be machined in the traditional machines because of its high strength at elevated temperatures, high strain hardened and low thermal conductivity. WEDM is an alternative machine which is used for machining of Inconel 825, because WEDM can machine any material without considering its hardness if the material is electrically conductive. Liquid Nitrogen cooled (LN_2) Zinc-coated brass is taken as a cathode and the Inconel 825 is taken as an anode during the machining process. Taguchi's L_{27} orthogonally array is used in the experimentation method. Five parameters of WEDM i.e., Wire Tension, Wire Feed, Pulse on Time, Pulse off Time, Servo Voltage are taken as inputs and MRR and Surface finish are taken as the output responses. In this paper, an attempt is made to study the effect of various parameters and optimize the result. Mathematical modelling of the output responses is developed.

Keywords Nickel-based superalloy (Inconel 825) · Taguchi method · Material removal rate · Surface roughness · Liquid cooled nitrogen

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BATTERY OPERATED IONTOPHORESIS FOR HYPERHIDROSIS AND CARDIOVASCULAR DRUG DELIVERY SYSTEM

Mrs.R.Sugunadevi , Assistant Professor,
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Abstract—Excessive amount of sweat by sweat glands is known as Hyperhidrosis. It is categorized into localised and general forms. Initially, iontophoresis uses direct current in the treatment of palmoplantar hyperhidrosis. In the treatment of hyperhidrosis, antichlorogenic drugs are used. The DC may results in side effects such as pain and burns. In order to reduce burns, iontophoresis with alternating current was performed in patients efficiently. Using AC, there were no such side effects during iontophoresis. It was combined with cardiovascular drug delivery system. The drugs are penetrated poorly thorough the skin. By utilising small amount of current, the cardiovascular drugs are penetrated. It helps in delivery of protein and low molecular weight drugs. To reduce shock effects, the battery operated iontophoresis is used. So, it will be efficient and highly safe.

Keywords — *antichlorogenic drugs, cardiovascular drugs, battery, hyperhidrosis*

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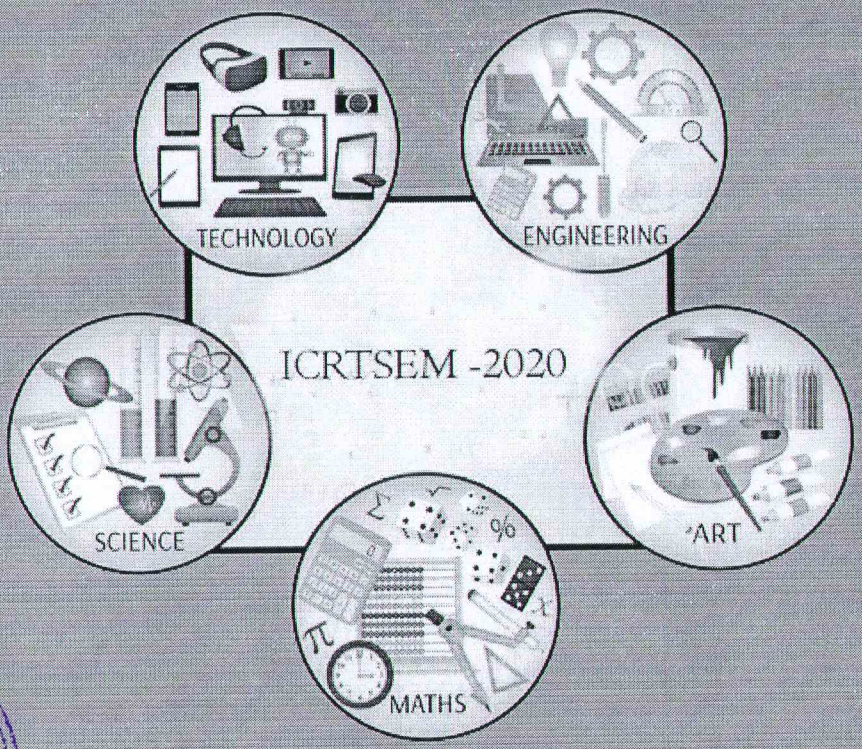

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DESIGN AND DEVELOPMENT OF DUAL AXIS CONTROLLED WRITING ROBOT FOR PHYSICALLY CRIPPLED

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Abstract:

Nowadays people are turning to robots to do their work. Because robots are more versatile, accurate, reliable reduce human efforts. Artificial Intelligence became the part and parcel of this modern Era. Humans are fortunate enough to perform their daily chores. So, we are the "BLESSED CREATURES" But what about physically handicapped people? This is our small contribution for them."DESIGN AND DEVELOPMENT OF DUAL AXIS CONTROLLED WRITING ROBOT FOR PHYSICALLY CRIPPLED" Obviously, it has more efficiency, low cost and has high advantages. The robot is made to write both voice comments and text comments. In this project, The voice and text messages will be recorded using application in mobile phone. Then the recorded input will be sent to microcontroller through Bluetooth, a wireless device. The controller performs the data preprocessing, in which the text is converted into characters by NLP. finally the motor actions are performed based on the recorded voice or text. It is the valuable device for physically handicapped to write their exams by simply recording voice or text.

Keywords: ATMEGA 328P; Crippled people; Bluetooth; NLP algorithm; Motor.

BREAST CANCER DETECTION USING KNN CLASSIFIER

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Abstract:

The paper proposes a novel Computer-Aided Detection (CAD) system to scale back the human issue involvement and to assist the radiotherapist in automatic diagnosing of benign/malignant breast tissues by utilizing the basic morphological operations. The input Region of Interest (ROI) is extracted manually and subjected to additional variety of preprocessing stages. The geometrical and texture features are used for feature extraction of suspicious region. After that a KNN classifier is introduced to classify the required class of the breast cancer. After that we use aurduino controller for displaying the outputs using LCD display.

Keywords: CAD, Region of interest, Pre-processing, Cancer, LCD

FINGER VEIN EXTRACTION USING PNN CLASSIFIER

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Abstract:

Finger vein recognition is a method of biometric authentication that uses pattern recognition techniques .Based on images of human finger vein patterns beneath the skin's surface. Finger vein recognition is one of many forms of biometrics used to identify individuals and verify their identity. Finger Vein ID is a biometric authentication system that matches the vascular pattern in an individual's finger to previously obtained data.

Keywords: Finger vein biometric authentication, patterns, PNN classifiers.

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GLAUCOMA DETECTION AND SEGMENTATION USING IMAGE PROCESSING

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Abstract:
In this paper we present a computational tool for automatic glaucoma detection. We report improvements for cup and disc segmentation in comparison with other works on the literature .Obtained a sensitivity of 100% indicating that, there is no false negative. This will reduce the workload of clinicians by more than 50%. Used less number of features to obtain highest classification accuracy.
Keywords: Glaucoma,cup and disc segmentation,false negative,accuracy

SMART BILLING TROLLEY USING RFID AND ZIGBEE

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Abstract:
In this Paper, we have proposed a new smart shopping trolley using RFID (Radio frequency identification) to avoid standing in long queues and saving time while shopping.When the customer places the product in the smart trolley the RFID reader will read the product ID and information related to it will be store in the controller. The communication is between main server and billing system via Zigbee module. The Zigbee receiver sends the total cost of the product to the billing section of PC.Thus the total products in the trolley will be calculated in the central billing system. Here,we have implemented a new technique in shopping which provides assistance for the blind people.
Keywords: RFID, Shopping, Zigbee, Smart Trolley

BRAIN TUMOR DETECTION IN MICROWAVE IMAGING SYSTEM BY USING EBG BASED MICROSTRIP PATCH ANTENNA

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Abstract:
A Microwave brain imaging system model is envisaged to detect and visualize tumor inside the human brain. A compact and efficient microstrip patch antenna is used in the imaging technique to transmit equivalent signal and receive the backscattering signal from stratified human head model. The simulation results obtained from CST are compared to those obtained from HFSS to validate the design. The overall results obtained confirm that the studied brain imaging system can successfully diagnose brain tumor at the Early stage while maintaining safety regulation of the patient under test.

Keywords: Brain, Signal, HFSS, Tumor

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FPGA IMPLEMENTATION OF SDR BASED MTEA ENCRYPTION AND DECRYPTION

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Abstract:
This project proposes a field-programmable gate array (FPGA)-based software defined radio (SDR). The implementation of digital MTEA in SDR platform is purely a new kind. In this, we present a Software Defined Radio (SDR) platform which replaces a multiple platform-based system with a single platform. The conventional encoding algorithm of LDPC is more Complex design due to this modified tiny encryption algorithm used which is easy to design. For achieving the faster communication most of confidential data transmitted through the network. Cryptographic algorithms are used to improve the security. This project attempts to develop a simple, stronger and safer cryptographic algorithm which would not only be a secure one, but also reduces total time taken for encryption and decryption. In the existing system, there are some security issues. Hence in order to provide security mechanism, we propose an algorithm called Modified Tiny Encryption Algorithm (MTEA). So, a Modified TEA algorithm (MTEA) uses the Linear Feedback Shift Register (LFSR) to overcome the security weakness of the LDPC algorithm against attacks. So, it is a new secret-key block cipher of 64 bit that uses good features of Tiny Encryption Algorithm (TEA). LDPC consumes more time and security level is very low. So we go for MTEA. In this project we use MIMO wireless based cryptosystem. Modified Tiny Encryption (MTEA) is designed by using Xilinx ISE-14.7 and Modelsim-6.3f.
*Keywords:*FPGA,SDR, Modified Tiny Encryption,LDPC

CLASSIFICATION OF MELANOMA AND NEVUS IN DIGITAL IMAGES FOR DIAGNOSIS OF SKIN CANCER

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Abstract:
Melanoma is considered a fatal variety of skin cancer. However, it is sometimes hard to distinguish it from nevus due to their identical visual look and symptoms. The number of cases is growing amongst children but if it is diagnosed at its earlier stage then the survival rate becomes very high. The cost and time required for the doctors to diagnose all patients for melanoma are very high. In this research work, we propose a system to detect and distinguish melanoma from nevus by using state of the art image process techniques. At first, preprocessing is used for removing noise from the skin lesion of the acquired images followed by the use of improved HSV color space conversion clump to section out the lesion. A distinctive hybrid super feature vector is formed by the extraction of textural and color options from the lesion. Support Vector Machine (SVM) is employed for the classification of skin cancer into melanoma and nevus. Our aim is to test the effectiveness of the projected segmentation technique, extract the foremost appropriate options and compare the classification results with the opposite techniques present within the literature. Our proposed methodology achives encouraging result
Keywords: HSV, Support Vector Machine, melanoma, and nevus

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