Conference Proceedings

International E-Conference on

Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

International E-Conference on

Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Sponsored by

All India Council for Technical Education (AICTE), New Delhi.

Organized by

Department of Biotechnology

&

Information Technology

In association with ISTE & IEI Coimbatore Local centre

Kumaraguru College of Technology
Coimbatore-641049
Tamil Nadu

www.kct.ac.in   info@kct.ac.in

www.kct.ac.in   info@kct.ac.in

Content

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Professor /BT	Professor /IT	Associate Professor & Head	Professor & Head

ORGANIZING SECRETARIES	
Dr. K. Kumaravel Assistant Professor Department of Biotechnology Mobile: +91-7708257489 Email: kumaravel.k.bt@kct.ac.in	Dr. .Rajathi Professor Department of Information Technology Mobile:+91- 9600558348 rajathi.n.it@kct.ac.in

FACULTY MEMBERS			
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Sruthi.B	Vyshali	Goutham T	
Dhivyalakshmi B S		Sneha.M	

MESSAGES

KUMARAGURU
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character is life

Principal's Message

It gives me a great pleasure to be part of the AICTE Sponsored E-Conference on "Image Analysis for Treatment of Human Infectious Diseases" during 6th & 7th November, 2020 jointly organized by the departments of Biotechnology and information technology, KCT, Coimbatore - 641049. I am pleased to welcome all the delegates of the conference from different disciplines to address the recent developments in image analysis of human infectious diseases using various software tools.

I hope this conference is going to serve as platform to share their scientific expertise and research outcomes to achieve smarter solutions through their innovative ideas. I would like to express my appreciation to the organizing team for their efforts and I hope that all participants will have a fruitful learning experience.

I congratulate the faculty members, student volunteers and participants of this conference and wish them every success.

Dr.J.Srinivasan
Principal

Dr. J. SRINIVASAN, M.Tech.,Ph.D.
PRINCIPAL
Kumaraguru College of Technology
Coimbatore - 641 049.

Message from HoDs

Image analysis plays an important role in the scientific field due to its wide range of applications in quantitative measurements. Visualization and image analysis methods are critical for understanding various features of cell biology, molecular biology and neuroscience. With the development of fluorescent probes and the application of high-resolution microscopes biological image processing techniques became more reliable with a profound impact on research in the biological sciences.

The AICTE sponsored e-Conference on "Image Analysis for Treatment of Human Infectious Diseases" is going to be held during **6th - 7th November, 2020** is jointly organized by the Departments of Biotechnology and Information Technology.

This e-conference provides a platform for the scientists and participants to interact with each other on the theme of image analysis for the treatment of human infectious diseases. In this conference, as part of Information Technology, the diverse areas are taken in part of Artificial Intelligence, predictive analysis and IoT in Healthcare systems. The topics are not only restricted with this part but also widen related to the Information Technology disciplines. As part of Technology related view the participants assuredly get an in-depth knowledge and connectivity from the expert delegates of this conference.

At this juncture, we appreciate the coordinators of the conference both the department of Biotechnology and Information Technology for having organized the event at an appropriate time. We wish all the participants an eventful and memorable learning experience.
We wish the conference all success

Dr.R.Baskar

HoD / BT

Dr.M.Alamelu

HoD / IT

Theme Paper

Dr. Thomas Seviour. PhD
Associate professor,
Department of Biological and Chemical Engineering,
Aarhus University
Denmark

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It is with much pleasure that I present a Keynote speech at this year's International e-conference on Image Analysis for Treatment of Human Infectious Diseases at the Department of Biotechnology, Kumaraguru College of Technology, in Coimbatore. This will be the second time I will have presented at an International Conference at KCT, and I only regret that I will not be able to attend in person this time around. I had such a wonderful time at KCT last time, where I met all the highly committed and talented academics, and left with such admiration for the quality of mentorship and training providing for the students in KCT. The students are all so enthusiastic and bright and they seem poised to make a positive impact on society, in India and abroad, through science and technology.

I was lucky enough to host one such student, in fact, from KCT last winter in my lab at the Singapore Centre for Environmental Life Sciences Engineering (SCELSE) at Nanyang Technological University. Deenadayalan KG worked with me for four months investigating the toxicity of nanoplastics to

microorganisms involved in nutrient biotransformations. Unfortunately, global events cut short his visit to Singapore, but nonetheless in his time in Singapore Deena laid the foundations for a key study on nanoplastic toxicity in bacteria that will have massive

implications for biological wastewater treatment processes and global oceanic nitrogen cycling. The study has shed light on not only the impact of nanoplastics, but also mechanisms of interaction between nanoplastics and microbial biotransformations. These insights were enabled by microscopy and image analyses similar to the ones being profiled in this exciting conference, and I look forward to sharing them with the attendees during my keynote presentation. Given the potential for applying advanced microscopy and image analyses to address a range of key challenges, environmental and medical (e.g. infectious disease), I hope to see Coimbatore become a hub for advanced microscopic techniques. I believe that the qualifications and experiences of those guiding research there would ensure that such a center would meet the imaging demands of the region with consideration for the particular constraints and needs of India, and in doing so gain international recognition.

As mentioned, I enjoyed myself immensely the last time I presented at the conference, engaging in scientific discussions and also taking in the many amazing sights, including tiger reserves and elephant crossings in busy highways, and flavors, discovering a love for idli, of Tamil Nadu. While I

cannot make it this time around, I hope to have the opportunity to introduce Tamil Nadu to my family whenever another opportunity to visit presents, as well as facilitate student exchanges and opportunities for research training in Coimbatore and either Singapore or Denmark. I look forward to meeting all the attendees at the conference.

Programme Schedule

International E-Conference on
Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 | Zoom Meeting

Agenda (Day 1 : 6 Nov 2020)

04.00 pm - 04.02 pm	Prayer **Sivasankari & Divyalakshmi**, Third year B.Tech(BT), KCT
04.02 pm - 04.08 pm	Welcome Address **Dr.J.Srinivasan**, Prinicipal, KCT
04.08 pm - 04.13 pm	About the Conference **Dr.R.Baskar**, Associate Professor & Head, Department of Biotechnology, KCT
04.13 pm - 0 4.23 pm	Presidential Address **Shri. Shankar Vanavarayar**, Joint Correspondent, KCT
04.23 pm - 04.30 pm	**Release of Conference Abstract Proceedings**
04.30 pm - 04.38 pm	Inaugural Address **Dr. Thomas Seviour. PhD,** Associate professor, Department of Biological and Chemical Engineering, Aarhus University, Denmark
04.38 pm - 04.45 pm	Vote of Thanks **Dr.M.Alamelu**, Associate Professor & Head, Department of Information Technology, KCT
04.45 pm - 05.45 pm	**Keynote Address -1** Fluorescence microscopy sheds light on the mechanism of disruption of microbial nutrient bioprocess by nanoplastics **Dr. Thomas Seviour. PhD**, Associate professor, Department of Biological and Chemical Engineering, Aarhus University, Denmark
05.45 pm - 06.00 pm	Break
06.00 pm - 07.00 pm	**Keynote Address -2** Healthcare Analytics **Mr. Sivakumar Palanisamy,** Global Technology Executive, Chief Architect-Johnson & Johnson, Digital Surgery, Multi Cloud Expert, Technical Evangelist -Piscataway, New Jersey

International E-Conference on

Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 | Zoom Meeting

Agenda (Day 2 : 7 Nov 2020)

Time				
9.00 am - 10.00 am	Keynote Address -3 Medical Image Analytics **Dr.Deepak Mishra**, Associate Professor & Head, Department of Avionics, Indian Institute of Space Science and Technology, Trivandrum			
10.00 am – 10.30 am	Break			
10.30 am – 12.30 pm	Session -1	Session -2	Session -3	Session -4
	BT & IT	BT & IT	IT	IT
12.30 pm – 2.00pm	Break			
2.00 pm – 4.00 pm	Session -5		Session -6	
	BT & IT		BT & IT	

Technical Sessions

BT-TRACK

International E-Conference on
Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.11.2020 Time: 10.30AM to 12.30 PM

Session 1

MS Teams Link : https://tinyurl.com/yxzav238

Chair : **Dr. P. Saravanan**
Assistant Professor of Biotechnology
Rajalakshmi Engineering College
Rajalakshmi Nagar, Thandalam, Chennai 602 105

Mobile Number : +91 9381981008
Co-Chair:
Name : **Dr. K. Ram**
Mobile Number : 9940744077
Student Volunteers : **Mr. Siddarth Krishna**
Mobile Number : 9943855534

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
BTP-1	Determination of the wound healing effect of selected leaf extracts using in vitro scratch assay with L929 Fibroblasts	Gowthama Prabu Udayakumar	9965595535	10.30 AM to 10.40AM
BTP-2	Role of metal ions in antimicrobial resistance on mixed species biofilm.	K G Deenadayalan	8883425050	10.40 AM to 10.50 AM
BTP-3	In silico screening of antimicrobial compounds using docked complexes of antibiotics and antimicrobial peptides.	Dinakari S	9600917517	10.50 AM to 11.00 AM
BTP-4	The Immunogenetics of Human Infectious Diseases	Dr.Selvan V	8925298651	11.00 AM to 11.10AM
BTP-5	Image Analysis For Treatment Of Malaria.	Subiksha.N	7358588775	11.10AM to 11.20 AM

Concluding remarks by Chair & Co-Chair

Technical Presentation: 07.11.2020 Time: 10.30AM to 12.30 PM

Session- 2

MS Teams Link : https://tinyurl.com/y3q4reka

Chair : **Dr. M. Johnson**
Associate professor
Department of Botany
St.Xavier's College, Palayamkottai, Tamil Nadu
Mobile Number : 97869 24334
Co-Chair : Mr. P. Muthukumaran
Mobile Number : 7402088808
Student Volunteers : **Ms.**Poompavai R
Mobile number : 9597267833

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
BTP-6	Image Analysis For Treatment Of Tuberculosis	Rithikakalyani	6385475093	11. 30 AM to 11.40 AM
BTP-7	Human Immuno Deficiency Virus (Hiv)	Nivethidha.K	6282640174	11.40 AM to 11.50 AM
BTP-8	Automated Pathogen killer and Sterilizer for used Personal protective Equipment's	M. V Umesh	+919600085001	11.50 AM to 12.00 PM
BTP-9	Covid-19 Portable Incinerator for PPE Kit	Anna Mathew	+918220761415	12:00 PM to 12.10 PM
BTP-10	Medical Images processing using effectiveness of Walsh Function	Tamilarasu Viswanathan	9566625001	12: 10 PM to 12.20 PM

Concluding remarks by Chair & Co-Chair

Technical Presentation: 07.11.2020 Time: 2:00 PM to 4:00 PM
Session -3

MS Teams Link   : https://tinyurl.com/y6h5tghe

Chair   : **Dr. M. Anantha Subramanian**

            Professor and Head

            Department of Biotechnology,

            PSG College of Technology

Co-Chair   : **Dr. R. Baskar**

Mobile Number   : 9894709273

Student Volunteers   : **Ms** S.Nikita Reddy

Mobile number   : 9810415094

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
BTP-11	Automatic Sanitizing Hand Gloves for Public Workers	V R Balaji	9894848190	2:00 PM to 2:10 PM
BTP-12	A Machine Learning based Framework for identifying Diabetic Retinopathy in Retinal Fundus Images using Wavelet Features	Gopinath. B	8667735416	2: 10 PM to 2:20 PM
BTP-13	"Encapsulation and Characterization of Fucoidan-Curcumin nano micelle for Anti-inflammatory effects"	Balaji Sadhasivam	9944266097	2:20PM to 2:40 PM

Concluding remarks by Chair & Co-Chair

International E-Conference on

Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.11.2020 Time: 2:00 PM to 4:00 PM
Session-4

MS Teams Link : https://tinyurl.com/yxoe2yeh

Chair : Dr. B A Gowri Shankar
Assistant Professor
School of Chemical & Biotechnology
SASTRA Deemed University
Tirumalaisamudram
Thanjavur - 613401
Mobile 9445262525

Co-Chair : **Dr.K.Kumaravel**
Mobile Number : **7708257489**
Student Volunteers : **Ms.** Kavya Sri V
Mobile number : **7373842285**

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
BTP-14	Classification of ECG Cardiac Arrhythmia using Genetic Algorithm - Support Vector Machines	M.Mathankumar	9791755240	3.00 PM to 3:10 PM
BTP-15	Deep learning-based image analysis model for diagnosing Thyroid Carcinoma in Fine Needle Aspiration Cytology (FNAC) images	Gopinath. B	8667735416	3:10 PM to 3.25PM
BTP-16	Skin Disease Recognition Method Based on Image Color and	P. Rooba	7358866655	3:30 PM to 3.40 PM

Texture Features

Abstracts

BT-TRACK

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BTP-1

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Determination of the wound healing effect of selected leaf extracts using *in vitro* scratch assay with L929 Fibroblasts

Gowthama Prabu Udayakumar[a], PooraniGurumallesh[a] and Baskar Ramakrishnan[a*]

[a]Department of Biotechnology, Kumaraguru College of Technology, Coimbatore, Tamil Nadu 641049 India

Abstract

Wound healing is the process by which the skin repairs and maintains itself. Any delay in the healing might result in various skin pathologies like prolonged non-healing and chronic ulceration. Traditional medicines use plant-based products that play an important role in cutaneous wounds. L929 Fibroblast cell line forms the connective tissues which hold importance by synthesizing extracellular matrix and collagen in the process of wound healing. The cold percolated ethanol leaf extracts of *Beta vulgaris* and *Psidium guajava* were compared for its *in vitro* wound healing activity through Scratch wound assay performed on L929 cells. The rate of healing was examined at regular intervals and determined using ImageJ software. The skin cell re-epithelialization property was identified in comparatively higher levels in the ethanolic extract of *Beta vulgaris* when compared to that of *Psidium guajava*. This study aims to compare the *in vitro* wound healing activity of the selected ethanol extracts with that of the standard positive control, thereby extending its application for *in vivo* wound healing capacity useful in the cosmetic industries.

Keywords:*Beta vulgaris*; *Psidium guajava*; Cold percolation; Fibroblast; ImageJ; Wound scratch assay.

BTP-2

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Role of metal ions in antimicrobial resistance on mixed species biofilm.

#Deenadayalan Karaiyagowder Govindarajan[1,2], Muthusaravanan Sivaramakrishnan[1], Ram Kothandan[1], and Kumaravel Kandaswamy[1, *]

[1]Department of Biotechnology, Kumaraguru College of Technology, Coimbatore - 641049, Tamil Nadu.

[2]Department of Biotechnology, KIT-Kalaignarkarunanidhi Institute of Technology, Coimbatore- 641402, Tamil Nadu

#Presenting author: Deenadayalan K G
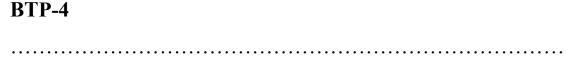
*Corresponding author email: kumaravel.k.bt@kct.ac.in

Abstract

Fluorescent microscopes such as Wide Field Microscopes (WFM) and Confocal Laser Scanning Microscope (CLSM) have been extremely important in both visualizing and understanding the complex structure, relationships, and organization of bacterial cells and biofilms. In particular, CLSM provides optical sectioned 3D images that can be processed and quantified based on fluorescent signals. In recent years, images obtained from fluorescent microscopes were often processed using image analysis tools such as IMARIS, Comstat, OMERO, ImageJ, MATLAB, and R packages. Using those techniques one can quantify the Biovolume, surface area, colocalization, cell numbers, maximum/minimum dimensions of cells, cell area, average gray value, and cell orientations. In this study, we present a simple yet efficient way to perform image analysis of fluorescent-labeled bacterial cells to quantify protein localization patterns, cell count, and cell sorting.

Keywords: Biofilms, CLSM, image analysis, and MATLAB.

BTP-3

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In silico screening of antimicrobial compounds using docked complexes of antibiotics and antimicrobial peptides

DinakariSarangan, Krithika Balakrishnan, Apsara Sudhakar, DarsiniThiyagarajan, Ram Kothandan, and KumaravelKandaswamy*

Department of Biotechnology, Kumaraguru College of Technology, Coimbatore - 641049, Tamil Nadu.

#Presenting author: DinakariSarangan

*Corresponding author email: kumaravel.k.bt@kct.ac.in

Abstract

Biofilms are sessile aggregates of bacterial cells encased by a slimy matrix that protect the cells from bactericidal molecules. Biofilm associated infections such as Urinary Tract Infections (UTI) caused by bacterial strains such as *Escherichia coli* and *Enterococcus faecalis* showincreased resistance to the antimicrobial compounds due to polymicrobial nature of biofilms. The matrix of biofilm generally contains exopolysaccharides, eDNA, and proteins that are crosslinked to provide structural integrity to the biofilms. The proteins in the biofilm are regarded as the potential targets for the antibiotics and the antimicrobial peptides, which kills the bacterial population in the biofilm by disrupting them. Earlier studies have reported that the metabolically active cells in the biofilms killed by antimicrobial peptides and low metabolically active cells are destroyed by antibiotics. In this study, we have used several combinationof antibiotics and antimicrobial peptides, we have obtained a docked complex of Human Beta Defensin 3 (Positively charged peptide) with Ciprofloxacin (Negatively charged antibiotic) and Dermcidin (Negatively charged peptide) with Tobramycin (Positively charged antibiotic). The efficient pair of antimicrobial peptide and antibiotic was then used to dock with biofilm matrix proteins. In essence, this study aims to provide a combinatorial approach to

identify drug targets in biofilm associated infections.

Keywords: In-silico docking, antimicrobial peptide, biofilms, and antibiotics.

BTP-4

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The Immunogenetics of Human Infectious Diseases

Nivethidha.K,

Department of Biotechnology, Kalasalingam Academy of research and education.

Abstract

The Immunogenetics of Human Infectious diseases plays significant role in transferring the diseases to their future generations in the family. The host genetic factors are major determinants of susceptibility to infectious diseases in humans. Twin studies have found high heritability's for many humoral and cellular immune responses to pathogen antigens, with most of the genetic component mapping outside of the major histocompatibility complex. Candidate gene studies have implicated several immunogenetic polymorphisms in human infectious diseases. HLA variation has been associated with susceptibility or resistance to malaria, tuberculosis, leprosy, AIDS, and hepatitis virus persistence. Variation in the tumour necrosis factor gene promoter has also been associated with several infectious diseases. Chemokine receptor polymorphism affects both susceptibility to HIV-1 infection and the rate of progression to AIDS. Inactivating mutations of the γ-interferon receptor lead to increased susceptibility to atypical mycobacteria and disseminated BCG infection in homozygous children. The active form of vitamin D has immunomodulatory effects, and allelic variants of the vitamin D receptor appear to be associated with differential susceptibility to several infectious diseases. NRAMP1, a macrophage gene identified by positional cloning of its murine homologue, has been implicated in susceptibility to tuberculosis in Africans. Whole genome linkage analysis of multi-case families is now being used to map and identify new loci affecting susceptibility to infectious diseases. It is likely that susceptibility to most microorganisms is determined by large number of polymorphic genes, and identification of these should provide insights into protective and pathogenic mechanisms in infectious diseases.

Key Words: genetics linkage, HIV, tuberculosis, malaria, hepatitis

BTP-5

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Image Analysis For Treatment Of Malaria

SUBIKSHA.N , KalasalingamAcamedyof Research and Academy, Tamil Nadu

Abstract

Malaria is caused by protozoan parasites of the genus Plasmodium that are transmitted through the bites of infected female Anopheles mosquitoes and that infect the red blood cells. Malaria remains a major burden on global health, with roughly 200 million cases worldwide and more than 400,000 deaths per year. One of the barriers toward a successful mortality reduction has been inadequate malaria diagnosis in particular. To improve diagnosis, image analysis software and machine learning methods have been used to quantify parasitemia in microscopic blood slides. Accurate parasite counts are essential not only for malaria diagnosis. They are also important for testing for drug-resistance, measuring drug-effectiveness, and classifying disease severity. However, microscopic diagnostics is not standardized and depends heavily on the experience and skill of the microscopist. This sober analysis of malaria diagnosis has prompted efforts to perform malaria diagnosis automatically. Automatic parasite counting has several advantages compared with manual counting: i.it provides a more reliable and standardized interpretation of blood films, ii. it allows more patients to be served by reducing the workload of the malaria field workers, andiii. it can reduce diagnostic costs.

Key word: Malarial parasite, Automatic parasite counting

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BTP-6

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Image Analysis For Treatment Of Tuberculosis

Rithikakalyani.
Department of Biotechnology; kalasalingam academy of research and education

Abstract

Tuberculosis is an infectious disease usually caused by Mycobacterium tuberculosis bacteria. Tuberculosis generally affects the lungs, but can also affect other parts of the body. It is in the second place after HIV\AIDS as the top deadly disease in world wide .More than 95% of TB death rate is in middle and low income countries,60%TBpatientsareinAsia.Sputumsmearmicroscopy is the most widely used one for TB detection. Manually and is often time consuming process to diagnose TB. Automatic screening methods is easy to identify TB bacteria from microscopic sputum smear images. In this paper, we are reviewing on automatic TB diagnosis technique using morphological features and ellipse fitting.

Key Words: Tuberclosis, Mycobacterium

BTP-7

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Human Immuno Deficiency Virus (HIV)

Nivethidha.K,

Department of Biotechnology, Kalasalingam Academy of research and education.

Abstract

Tracking human immunodeficiency virus-type (HIV-1) infection at the cellular level in tissue reservoirs provides opportunities to better deal with the pathogenesis of infection and to rationally design and monitor therapy. image analysis and in situ hybridization were combined to show that in the presymptomatic stages of infection there is a large ,relatively stable pool of virions on the surface of follicular dendritic cells and a smaller pool of productively infected cells. The cellular sources of virus production and storage in lymphoid tissues can be knownover the course of infection and treatment. Standardized technique to detect HIV-neutralizing antibody responses are of great importance in the search for an HIV infection. We found neutralization strength to be a significant factor in the ability of virus to form syncytia. Further, we introduce the inhibitory concentration of plaque area reduction (ICpar) as an additional measure of antiviralactivity.

Key words: HIV

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BTP-8

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Automated Pathogen killer and Sterilizer for used Personal Protective Equipment's

M. V Umesh[1], K K Anilkumar[2], S. Ranganathan[3]

[1,2,3] Department of Electronics and Instrumentation, Kumaraguru College of Technology, Coimbatore

Abstract

In the wake of the Covid-19 crisis, surgical masks and Personal Protective Equipment's have become expensive, scarce, and highly demandable by doctors, para medical staff and community. It has been observed around the globe a high demand for these kits. This situation forced many people to reuse these kits and posing health hazards. To address this issue, we have come up with a concept design of a unique equipment which will sterilizes the PPE' kit which could be reusable. This equipment is so designed by the combination of three stage of sterilization process. The stages incorporate the proven pathogen-killers namely oxidizing agent followed by Ultra-sonication (Ultrasonic waves) and Ultraviolet-C irradiation. The complete system is automated using smart controllers, smart sensors and the sterilization cycle time varies between 30 to 60 minutes depends on the capacity.

Key Words: PPE kit, UV radiation

BTP-9

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Covid-19Portable Incinerator for PPE Kit

S Akshath[1], A Prasath[1], Anna Mathew[1], M V Umesh[2] and KK Anilkumar[2]

[1] Students of Electronics & Instrumentation Kumaraguru College of Technology
[2] Faculty of Electronics & Instrumentation Kumaraguru College of Technology

Abstract

During the pandemic period, the improper disposal of Personal Protective Equipment's (PPE) kits has emerged as one of the major health hazards. The kits which are used by the frontline workers and healthcare workers are not being disposed properly according to the norms dictated by the WHO (World Health Organization), this has turned out to be a major risk factor. Hence, to eliminate the dangers imposed by the discarded PPE kits, we have come out with a concept design of a Portable Incinerator, wherein this device can breakdown polypropylene based PPE kits using certain chemical compounds in a controlled environment . The end-product thus obtained is then treated with suitable reagents and can further be used as a raw material in the manufacture of other articles. Thus, by using the Portable Incinerator the risk of infection is greatly reduced and there is no waste product in the end.

Keywords:Covid -19, PPE Kit

BTP-10

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Medical Images processing using effectiveness of Walsh Function

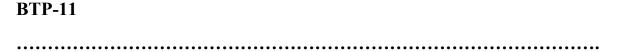Tamilarasu Viswanathan[1], Mathan Kumar M[2] and Sasikumar C[3]

[1, 2, 3] Department of Electrical and Electronic Engineering, Kumaraguru College of Technology, Coimbatore, India
Email: viswanathan.t.eee@kct.ac.in, mathankumar.m.eee@kct.ac.in,
sasikumar.c.eee@kct.ac.in

Abstract

This paper presents the new method for processing medical images using effectiveness Walsh function. The Block pulse functions is defined, and the coefficient function is developed for identifying fixations and boundary limitations. The algorithms developed for basic functions with respect individual blocks and simulating using MATLAB. Proposed scheme shows that the performance analysis is better than existing schemes.

Keywords: Walsh Function, Block Pulse Functions, Function coefficients and Fixations.

BTP-11

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Automatic Sanitizing Hand Gloves for Public Workers

V.R.Balaji, Dr.S.Kaliappan and Dr.B.Karunamoorthy

Department of Electrical and Electronics Engineering ,Kumaraguru college of technology
balaji.vr.eee@kct.ac.in

Abstract

Implementation of Automatic Hand-Sanitizing Glove would greatly help to prevent the spread of infection (COVID19). This glove would be similar to any other high-quality gloves available in market. The glove contains two layers made of quick-dry material. The top layer is made of porous material. The bottom layer is used as a support to pump sanitizer all over the upper surface of glove through porous layer. A motor is used to pump sanitizer. A vibration motor is used to pump sanitizer through the porous material. This vibration motor is just like the ones used in smartphones. Small-sized Lithium-ion Battery is used to run the motor. A sanitizer sachet is used and a separate provision is made at the bottom of glove, below the wrist. The sanitizer sachet can be refilled or replaced once it gets over. The battery and timer circuit are placed at the upper side of glove, above the wrist. The sanitizer dispensing can be set either automatic or manual through a switch, depending upon the user preference. The motor is set to pump sanitizer to a very less amount periodically, which can cleanse the glove and the glove is made of quick-dry material which doesn't allow to get wet. Now in real-time, if the user is driving or doing some work the glove can interrupt the activity. At that time, it can be switched to manual dispensing as it won't interrupt the user's activity. Usage of this glove will greatly reduce the spread ofinfection.

Keywords: Hand sanitizer, glove

BTP-12

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A Machine Learning based Framework for identifying Diabetic Retinopathy in Retinal Fundus Images using Wavelet Features

Gopinath Balasubramanian[1] and Santhi Ramalingam[2]

[1]Associate Professor, Department of Electronics and Communication Engineering,
Kumaraguru College of Technology, Coimbatore-641049, India
gopinath.b.ece@kct.ac.in

[2]Assistant Professor, Department of Biochemistry,
PSG College of Arts & Science, Coimbatore-641014, India
santhi@psgcas.ac.in

Abstract

In this work, the identification of Diabetic Retinopathy (DR) in retinal fundus images is addressed by developing a machine learning based framework using wavelet feature vectors and Support Vector Machine (SVM) classifier. The benchmark standard retinal images are pre-processed initially and fed to the segmentation stage as a second pass. The region based morphology segmentation approach is utilized to segment the significant foreground objects such as optic disc, blood vessel, exudates and microaneurysm. In the third pass of the framework, second-order statistical features are extracted using two-level wavelet transform. As the size of feature vectors is high, the significant feature vectors are identified and selected using statistical t-test (p-value). The proposed machine learning framework utilizes the optimized SVM as a final stage and performs the identification of diabetic retinopathy. The proposed model achieves a diagnostic accuracy of 97.2%, sensitivity and specificity of 96.8% and 100% respectively which are the promising results among the existing research work.

Keywords: Classifier, Diabetic Retinopathy, Fundus Images, Machine Learning, Wavelet.

BTP-13

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Encapsulation and Characterization of Fucoidan-Curcumin nano micelle for Anti-inflammatory effects

Balaji Sadhasivam, SaraswathyNachimuthu*

Department of Biotechnology, Kumaraguru College of Technology,

Coimbatore, TN, India. balaji.17phd@kct.ac.in, saraswathy.n.bt@kct.ac.in

Abstract

Curcumin is a potential bioactive compound, due to its hydrophobicity inhibits therapeutic application. Encapsulation of curcumin in a hydrophilic polymeric micelle enhances its bioavailability in biological system. Fucoidan is a functional polysaccharide from brown sea weeds possess various biomedical applications. In this work, curcumin was encapsulated in Fucoidan polymeric nano micelle (FCN). The optimal contact time for the encapsulation of curcumin was found to be 24 hours, average size of nano micelle formed 121 ± 0.1 nm with 67% curcumin encapsulation efficiency. Zeta potential was maximum of -47.4 which shows electro-kinetic potential in colloidal dispersions of Fucoidan Curcumin Nano Micelle (FCN). Physical Characterization of FCN by FTIR ,confirms conjugation of fucoidan and curcumin at finger print region with the peak shift at wave number 2215;1639;1517and1265cm-1.SEM, and TEM implies then a ture of encapsulation of curcumininpolymericmicelle.*Invitro*assays such as Antioxidant, Anti-Hemolytic and Anti-Inflammatory provides evidence for FCNs therapeutic application.

Key words: Anti-inflammatory effects, Fucoidan-Curcumin, nano micelle, TEM

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BTP-14

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Classification of ECG Cardiac Arrhythmia using Genetic Algorithm - Support Vector Machines

[1]M Ramkumar, [2]M Mathankumar, [3]A Manjunathan
[1]Department of Electronics and Communication Engineering, Sri Krishna College of Engineering and Technology, Coimbatore
[2]Department of Electrical and Electronics Engineering, Kumaraguru College of Technology, Coimbatore
[3]Department of Electronics and Communication Engineering, K.Ramakrishnan College of Technology, Trichy
[1]mramkumar0906@gmail.com, [2]mathankumarbit@gmail.com, [3]manjunathankrct@gmail.com

Abstract

This research study has been focused on exploring the novel approach for classifying the arrhythmia disease of cardiac muscle. The proposed methodology determines the combination of Genetic Algorithm and Support Vector Machines techniques. Initially, the feature extraction of twenty-four features has been made from the ECG waveform. The acquisition of these features has been made by partial automatic extraction from the amplitude (voltage)-time parameters of P peak, Q peak, R peak, S peak and T peak feature sets of an ECG waveform. Genetic Algorithm is utilized for improving the performance of generalization in the Support Vector Machine classifier. In order to proceed with this task, the optimization of Support Vector Machine classifier is done by performing the search of the parameter with the best value which makes tuning of its discriminate function and seeking for the best feature subset with which in response does the optimization of the fitness function associated with the classification results. Certain simulations have been carried out with the help of MATLAB software with which the results over the experiments determines the demonstration that the proposed methodology does the best classification of ECG waveforms in detecting the cardiac arrhythmias. The recorded ECG dataset has been acquired from MIT-BIH arrhythmia database and 4 different sorts of arrhythmias has been considered for performing the classification task and it is obtained with the results of 97.45% of accuracy, 95.2% of sensitivity, 95.4% of specificity and 96.23% of positive predictivity.

Keywords - Arrhythmia disease, Electrocardiogram, MIT-BIH arrhythmia database, Genetic Algorithm, Support Vector Machines, MATLAB

BTP-15

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Deep learning-based image analysis model for diagnosing Thyroid Carcinoma in Fine Needle Aspiration Cytology (FNAC) images

Gopinath Balasubramanian and Santhi Ramalingam

Associate Professor, Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore-641049, India
gopinath.b.ece@kct.ac.in

Assistant Professor, Department of Biochemistry, PSG College of Arts & Science, Coimbatore-641014, India
santhi@psgcas.ac.in

Abstract

In this work, the diagnostic accuracy of an automated diagnosis system is evaluated using two pre-trained convolutional neural network models, namely AlexNet and VGG16. The diagnosis system is used to identify the benign and malignant thyroid cells in Fine Needle Aspiration Cytology (FNAC) images. The proposed Alexnet and VGG16 models are implemented using deep learning based Transfer Learning (TL) to process multi-stained FNAC images. Initially, the image patches are derived from the cytology images based on the thyroid cell population. These patches are fed to the 8-deep layered AlexNet and 16-deep layered VGG16 as inputs and they are passed through multiple convolution layers, max pooling and dense layers. Through optimal implementation and testing of the models, the AlexNet model achieves a diagnostic accuracy of 92% whereas the VGG16 model outperforms with a higher diagnostic accuracy of 95.24% along with 98.67% of sensitivity and 92.47% of specificity. From the results, it is evident that the pre-trained deep learning models can play a vital role in effective diagnosis of malignant carcinoma in cyto-pathology images.

Keywords: Benign, Carcinoma, Deep Learning, Malignant, Thyroid

BTP-16

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Skin Disease Recognition Method Based on Image Color and Texture Features

P. Rooba,

Department of Biotechnology, Kalasalingam Academy of Research and Education, Tamil Nadu

Abstract

Skin diseases have a serious impact on people's life and health. Current research proposes an efficient approach to identify singular type of skin diseases. It is necessary to develop automatic methods in order to increase the accuracy of diagnosis for multitype skin diseases. Initially, skin images were preprocessed to remove noise and irrelevant background by filtering and transformation. Then the method of grey-level co-occurrence matrix (GLCM) was introduced to segment images of skin disease. The texture and color features of different skin disease images could be obtained accurately. Finally, by using the support vector machine (SVM) classification method. The experimental results demonstrate the effectiveness and feasibility of the proposed method.

Keywords: Skin diseases, support vector machine(SVM)

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Technical Sessions
IT-TRACK

International E-Conference on
Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.10.2020 Time: 10.00AM to 12.30 PM

Session 1

MS Teams Link : Technical session 1

Chair :Dr T Gopalakrishnan

Assistant Professor [Sg]

School of Computer Science & Engineering

Vellore Institute of Technology, Vellore

Mobile Number :+91 9942832002

Co-Chair:

Name :Dr.G.S.Nanda Kumar, Associate Professor, IT, KCT

Mobile Number :9842297979

Student Volunteers (18BIT205) : Naveena.N (18BIT20),Mirudula Lakshmi

Mobile Number : 7010669066, 9791766945

Co-ordinating Faculty :Ms.P.Shenbagam (9894281484)

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	Advancement in Identification & Classification Framework for Malaria Parasite based on Image Manipulation	Kavi priya C U Alamelu M	8531079355	**10.30 AM to 10.40AM**
2	Alzheimer's Disease Forecasting using Machine Learning Algorithms	Rajathi N Malavika G Vanitha V Parameswari P	9600689122	**10.40AM- 10.50AM**
3	Augmented Reality in Education Using Kinect	Saranya K Jayanthy S	8608992264	**10.50 AM to 11.00 AM**

4	Block Chain Based Solution to Improve the Supply Chain Management in Indian Agriculture	Sudha V Kalaiselvi R	9094583230	**11.00 AM to 11.10 AM**
5	A Novel Hybrid Method for Classification of Tumor in Gene Expression Based Central Nervous System Microarray Data	Jai Singh W Kavitha R K	9842505363	**11.10 AM to 11.20AM**
6	A Deep Learning Classifier for Accurate Detection of the Novel Coronavirus	Cynthia Jayapal , SathiyaPrakash M Shiddharth Saran M	9443066521	**11.20 AM to 11.30AM**
7	A Deep Learning Based Hybrid Network Intrusion Detection for a Software Defined Network	Dhanabal L Manikantan M	9443250137	**11.30AM-11.40AM**
8	E-Archiving and Approval System	Uma Maheswari S Parivel K Vikraman R Mukilgautham G	9489332589	**11.40 AM to 11.50 AM**
9	Human Activity Recognition Using Smartphone Sensors	Latha L Seetha Lakshmi G Selvaharshini E	9345439969	**11.50 AM to 12.00PM**
10	A Survey on Deep Learning and Machine Learning Approaches used for Intrusion Detection in IoT based health monitoring systems	Vanitha V Ahil M N Rajathi N	9715207004	**12.00PM to 12.10PM**
11	Comparitive Study of Machine Learning Approaches in Diabetes Prediction	Parameswari P Rajathi N Priyanka E B Thangavel S	9843034240	**12.10 PM to 12.20 PM**
12	Malarial Parasite Identification Using Convolution Neural Network	Kavitha S Sathyavathi S Priyadharshini R Varshini S	9865269456	**12.20PM to 12.30PM**
13	Four Port DC-DC Converter Characteristics for Different Hybrid Energy Systems	Nakshatra Shankar Dr. M. Mohanraj	9842973377	**12.30PM to 12.40PM**
Concluding remarks by Chair& Co-Chair				

International E-Conference on
Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.10.2020 Time: 10.00AM to 12.30 PM

Session 2

MS Teams Link   : Technical session 2

Chair   : Dr.K.UmaMaheswari

Professor &Head IT Department

PSG College of Technology ,   Coimbatore

Mobile Number :94437 16852

Co-Chair   : Dr.P.C. Thirumal, Associate Professor, IT, KCT

Mobile Number   :9842691667

Student Volunteers   : Ms.Deksha.H (19BIT027)Sneha.M(19BIT045)

Mobile number   : 9361366690 , 9042174007

Co-ordinating Faculty   :Ms.S.Sathyavathi (9865172444)

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	Software Module Customization Method to Create Awareness in Irrelevancy Requirements to the ERP Vendors	Hameed Ibrahim S	9894478296	**10.30 AM to 10.40AM**
2	Classification of Mushrooms to Detect their Edibility Based on Key Attributes	Vanitha V Ahil M N Rajathi N	9715207004	**10.40AM-10.50AM**
3	Neural Networks in Agriculture: A Survey	Parameswari P Rajathi N Vijay Kumar M Akshaya V S	9843034240	**10.50 AM to 11.00 AM**
4	Fake Currency Note Detection Using Image Processing	Latha L Raajshree B Nivetha D Kishore R	9345439969	**11.00 AM to 11.10 AM**
5	Product Recommender System Using Collaborative	Bharathipriya C Aswini D	900529497	**11.10 AM to 11.20AM**

	Filtering	Kirubakaran R Swathi B		
6	Study of Forest Cover Change Detection Using Data Analysis Methods	Shenbagam P Harini T Rajkumar N	9894281484	**11.20 AM to 11.30AM**
7	Agri Image Processing Using UML Model	Suguna M Nithya Priya S Thenmozhi G	9976750009	**11.30AM-11.40AM**
8	Ranking Based Recommendation and Securing Social Media	Uma Maheswari S Mayuri P T Abirami P V Adhersha T L	9489332589	**11.40 AM to 11.50 AM**
9	Classification of Cyber Attack Using Various Supervised Machine Learning Algorithms and Comparing their Performance Accuracy	Kirubakaran R Francis Jency X Archana Devi V V	9629026910	**11.50 AM to 12.00PM**
10	Smart Bin Collection System	Devaki P Sruthi G NekaMali K Minu Priya R	8056461871	**12.00PM to 12.10PM**
11	The Achromatic and b-chromatic number of the of Splitting Graphs	Thilagavathy K P Santha A Devaki P	962951661	**12.10 PM to 12.20 PM**
12	A Hybrid Approach for Autism Spectrum Disorder Classification	Jalaja Jayalakshmi V Geetha V	9600720260	**12.20PM to 12.30PM**
13	A Survey Paper on Driver Drowsiness Detection	R. Hari Haran Dr. P.C. Thirumal Dr. G.S Nanda Kumar	9842691667	**12.30PM to 12.40PM**
Concluding remarks by Chair& Co-Chair				

International E-Conference on
Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.10.2020 Time: 10.00AM to 12.30 PM

<u>Session 3</u>

MS Teams Link   : [Technical session 3](#)

Chair   :Dr K Kousalya

                                            Professor, Computer Science & Engineering

                                            Kongu Engineering College,

                                            Perundurai

Mobile Number:9942214795
Co-Chair   :Dr.J,Cynthia, Professor, CSE, KCT

Mobile Number   :9443066521

Student Volunteers   :Sruthi.K (19BIT009),Nanthini V(19BIT021)

Mobile number   :9566655677, 9361200552

Co-ordinating Faculty   :Ms.G.Prema Arokia Mary(9655523276)

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	Predicting Metamorphic Changes in Parkinson's Disease Using Machine Learning Algorithms	PremaArokia Mary G Suganthi N Hema M S Hari Dharshini Vaishaali Monika Sri M	9655523276	**10.30 AM to 10.40AM**
2	Face Generation using Deep Convolutional Generative Adversarial Neural Network	Devaki P Prasanna Kumar C B Kaviraj S Ramprasath A	8056461871	**10.40AM-10.50AM**
3	Speed Breaker Detection for Autonomous Vehicles	Bharathi M Amsaveni A	9786287975	**10.50 AM to 11.00 AM**

	Using Deep Neural Networks	Sasikala S		
4	Survey on Block Chain Technology and Key Management for data security	Saranyah V Suganthi N	9842968859	**11.00 AM to 11.10 AM**
5	Significant improvement of Hit ratio and Byte Hit Ratio by combining Web-caching and Web-Prefetching methods	Baskaran K R Vijilesh V Saroja M N	9942568386	**11.10 AM to 11.20AM**
6	Traffic Congestion and Detection using Image Processing	DhivyaPraba R Kavitha K Thilagavathi K Jasmine K Kalaiselvi A	9790490204	**11.20 AM to 11.30AM**
7	Prediction of Autism Spectrum Disorder Using Rough Set Theory	Geetha V V.Jalaja Jayalakshmi	9843060719	**11.30AM-11.40AM**
8	Order of Vertices of Comb Graph and Helm Graph with respect to Incidence Topology	VijetaIyer Santha A Devaki P	9840164907	**11.40 AM to 11.50 AM**
9	Order of Vertices of Path Graph and Star Graph with respect to Incidence Topology	Santha A VijetaIyer Devaki P	9786020109	**11.50 AM to 12.00PM**
10	Smart Home Door Unlocking System using PIC16F877A	Mohana Sundaram S Mohan Kumar N Arunkumar S	9944777152	**12.00PM to 12.10PM**
11	Smart Wheelchair Controlled by Eye Movement	Shivappriya S N Maheswari K Rahulkumar S Indhumathi S Sivasurya S V	9788906540	**12.10 PM to 12.20 PM**
12	Performance Comparison of Pan Tompkins and Wavelet Transform Based Ecg Feature Extraction Techniques	Shivappriya S N Maheswari K Harikumar R	9788906540	**12.20PM to 12.30PM**
13	Classification of Leucocytes Using Deep Learning	Suganthi N Preethi V Swetha K Kannan K	9842968859	**12.30PM to 12.40PM**
	Concluding remarks by Chair& Co-Chair			

Technical Presentation: 07.10.2020 Time: 10.00AM to 12.30 PM

Session 4

MS Teams Link	:	Technical session 4
Chair	:	Ms.Harshini Infanta A
		Client Solutions Partner
		Quantphi (AI & ML Solution Provider)
		Bangalore
Mobile Number	:	9003839005
Co-Chair	:	Dr.K.R.Baskaran, Professor, CSE,KCT
Mobile Number	:	9842290089
Student Volunteers	:	**Dhivya.R (19BIT017) Swathy.K (19BIT008)**
Mobile number	:	9150358323 ,6369507228
Co-ordinating Faculty	:	**Ms.S.Kavitha (9865269456)**

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	Deep Learning Approach to Identify Abnormalities in Blood Cell Images: A Review	Nithya Roopa. S Sandra. J Sherin. J Mary Magdalene Jane F	9840837260	**10.30 AM to 10.40AM**
2	Design and Development of Electric Scooter	Venkatesh B Lokitha T Arun Kumar S Sasikala S	9566725615	**10.40AM-10.50AM**
3	Awareness of Student's wellness in COVID'19 lockdown	Maheswari K Chandrakala.D Kiruthika. J	9442522106	**10.50 AM to 11.00 AM**

4	Wellness Survey Analysis amidst student community in the Pandemic Time	Maheswari K, VijetaIyer , Shivapriya S N Vijilesh Vijayan	9943797457	11.00 AM to 11.10 AM
5	A Enhanced Framework to Improve Agriculture based Information System	Jayakanthan N Manikantan M Hari Prasad K	9965561231	11.10 AM to 11.20AM
6	Malicious URL Detection using Rule based Optimization Techniques	Jayakanthan N Anuvarshini R M	9965561231	11.20 AM to 11.30AM
7	Heart Disease Prediction using Machine Learning Algorithms	Malavika G Rajathi N Vanitha V Parameswari P	9600689122	11.30AM-11.40AM
8	Classification and Forecasting Model for Covid -19 Disease Severities based on Medical Diagnosis using Weighted Average Dynamic Time Warping Technique	Gopalakrishnan Balasubramanian Manikantan M Purusothaman Parthasarathi	9791564916	11.40 AM to 11.50 AM
9	A study on the effectiveness of machine learning algorithms in early prediction of diabetics among patients	Kavitha R K Jaisingh W	9443014143	11.50 AM to 12.00PM
10	Mining Rare Associative Classification	Siddique Ibrahim S P Shanmathi J	9894442939	12.00PM to 12.10PM
11	Plant Disease Detection System for Smart Agriculture	Indhu R Thilagavathi K	9443089555	12.10 PM to 12.20 PM
12	An Efficient Dynamic Key Generation Architecture for Distributive Wireless Networks	Mathankumar M Thirumoorthi P Tamilarasu Viswaathan Suryaprakash S	9791755240	12.20PM to 12.30PM
13	Representation of SARS with Tableau	Saparna.S,G.S. Nandha Kumar	9025622814	12.30PM to 12.40PM
Concluding remarks by Chair& Co-Chair				

Technical Presentation: 07.10.2020 Time: 1.30PM to 4.00 PM

Session 5

MS Teams Link   : Technical session 5

Chair   : Dr.M.S.Hema,   Professor/CSE

                          Aurora's Scientific, Technological and Research

                          Academy, Hyderabad

Mobile Number   : **9842968859**

Co-Chair   : Dr.N.Suganthi Professor, CSE,KCT

Mobile Number   : **9994321633**

Student Volunteers   : **Ms.Deksha.H (19BIT027), Harini.K R(19BIT028)**

Mobile number   : 9361366690, 9442988195

Co-ordinating Faculty : **Ms.S.Sathyavathi (9865172444)**

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	Detection and Correction of Node Failures in Wireless Sensor Networks	Umamaheswari S Savitha Antony W	9842748465	**2.00PM-2.10PM**
2	Parking Management System	Sathya D I Jeena Jacob S Nithyaroopa K Praveen A Arun Kumar G Sanjeevan	9994326101	**2.10PM - 2.20PM-**
3	A Study of performance of various FACTS controllers suitable for aiding AGC in Multisource Power System	Mohana Sundaram N Arunkumar S Rani Thottungal D	9944777152	**2.20PM-2.30PM**

4	Effect of Hybrid max filter and edge detection on scanning electron microscope picture of calcium oxide and copper oxide nanocomposites	Marudhachalam R Renukadevi S Ananthi S Kannan R Tamilselvi R	9524785965	**2.30PM- 2.40PM**
5	Proliferative Diabetic Retinopathy Diagnostic Investigation Using Retinal Blood Vessels Mining Technique	Parameswari P Ponnibala M Priyanka E B Thangavel S Sivakumar N S	9843034240	**2.40PM- 2.50PM**
6	The Automatic Saline Level Monitoring and Alert System using IoT	Maithili P Mercy Ramya A	9500455148	**2.50PM- 3.00PM**
7	Deployment of Quantum Cryptographic Techniques in Securing the Patient Records in Smart Healthcare	Kowsalya T Krithika S	8056662536	**3.00PM- 3.10PM**
8	Generalized Regression Neural Network for Word Sense Disambiguation	Rajini.S Vasuki.A	9487284578	**3.10PM - 3.20PM-**
9	Face Recognition and Sensor based Techniques for Contactless Attendance Tracking and Screening Technology: A Technical Review	Sasikala S Arun Kumar S Abeshek B B Kavi Prakash C V Keerthivasan T Rishi K	807210388	**3.20PM- 3.30PM**
10	Coin Based Mobile Charger	Saroja M N Sathiya P K Ramalakshmi R	9600410757	**3.30PM- 3.40PM**
11	Attribute selection based subset generation on Lazy Learning Associative Classification	Siddique Ibrahim S P Sivabalakrishnan M	9894442939	**3.40PM- 3.50PM**
12	Alzheimer Disease Diagnosis Using Deep Learning: A Review	Baskaran K. R Sanjay V	9942568386	**3.50PM- 4.00PM**
Concluding remarks by Chair& Co-Chair				

International E-Conference on

Image Analysis for Treatment of Human Infectious Diseases

06 & 07 November 2020 |

Technical Presentation: 07.10.2020 Time: 1.30PM to 4.00 PM

Session 6

MS Teams Link	: Technical session 6
Chair	:Dr.M.SenthamilSelvi
	Professor &Head, Department of Information Technology
	Sri Ramakrishna Engineering College, Coimbatore
Mobile Number	: 8610005018
Co-Chair	:Dr.K.Parameswari,
	Assistant Professor, MCA,KCT
Mobile Number	: 9843034240
Student Volunteers	: Dhivya.R (19BIT017), Karishma.E(19BIT040)
Mobile number	: 9150358323, 7639642490
Co-ordinating Faculty	: Ms.S.Kavitha(98652 69456)

Sl.No	Title of the Paper	Name of the Presenting Author	Mobile No.	Time
1	A DC-DC Converter fed BLDC Motor Drive for Household Appliances	Arunkumar S Mohana Sundaram N Rani Thottungal	9566725615	**2.00PM-2.10PM**
2	Discovery of Unknown Classes in Constrained Semi-Supervised Learning	Nithya Roopa S Nagarajan N Sathya D	9840837260	**2.10PM -2.20PM-**
3	Towards Improving Skin Cancer Detection using Transfer learning	Sasikala S Arun Kumar S Shivappriya S N	9443525425	**2.20PM-2.30PM**

4	Significance of Literacy in Minimizing Infant Mortality and Maternal Anaemia in India: A State-Wise Analysis	ShivappriyaSathyamangalam Natarajan Maheshwari K Saroja M N RamalathaMarimuthu	9788906540	**2.30PM-2.40PM**
5	Implementation of Narrow band IoT in potential healthcare Services	Umamaheswari S Arthigaa K C Yazhini K	9842748465	**2.40PM-2.50PM**
6	Breast Cancer Identification Using Logistic regression	Sathyavathi S Kavitha S Priyadharshini R Harini A	9865172444	**2.50PM-3.00PM**
7	Rule Generation in Internet of Things to detect Anamoly and improve Network Performance	Jeba N Rathi S	9487340380	**3.00PM-3.10PM**
8	Human and Vehicle Tracking Application during Pandemic Situation	Dr.K.Paramasivam N.Arun C.Dinesh M.V.Harish V.Roobhanrahul	9942989881	**3.10PM -3.20PM-**
9	Performance ananlysis of metamaterial inspired frequency reconfigurable folded slot antenna for wearable applications	Amsaveni A Bharathi M	9894036677	**3.20PM-3.30PM**
10	A Driver Drowsiness Detection System	R. Hari Haran Dr. P.C. Thirumal Dr. G.S Nanda Kumar	9842691667	**3.30PM-3.40PM**
11	Blockchain Technology for Food supply chains	Sathya D, Nithyaroopa S Jeena Jacob I	9994326101	**3.40PM-3.50PM**
12	Mobile Based Leaf Disease Classifier	Chandrakala D R. Sarath Kishore R. Kishore M. K.Nandha Kumar	9442522106	**3.50PM-4.00PM**
Concluding remarks by Chair& Co-Chair				

Abstracts

IT Track

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ITP - 13	Software Module Customization Method to Create Awareness in Irrelevancy Requirements to the ERP Vendors Hameed Ibrahim S	72
ITP - 14	Classification of Mushrooms to Detect their Edibility Based on Key Attributes Vanitha V[1], Ahil M N[2] and Rajathi N[3]	73
ITP - 15	Neural Networks in Agriculture: A Survey Parameswari P[1] ,.Rajathi N[2], Vijay Kumar M[3], Akshaya V S[4]	74
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ITP-1

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Advancement in Identification & Classification Framework for Malaria Parasite based on Image Manipulation

Kavi priya C U [1] andAlamelu M [2]

[1]Student, M.Tech Data Science, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

[2]Associate Professor, Department of Information Technology,Kumaraguru College of Technology, Coimbatore

Abstract

The transmission of malaria disorder is done by Anopheles genus female mosquitoes. This type of genus mosquitoes is a solitary parasite. The mosquitos that are infected, while sucking the blood it will pass through its salivary glands. The plasmodium then gets injected to the human's blood. In red blood cells the parasites will follow certain division. It gets burst out and it will throw oneself into other RBC's by spreading the parasite. Identifying these type of parasite earlier will reduce the death values. Across globe. We proposed an image manipulation - followed totally Malaria disorder discovery framework called the advancement in classification and identification framework for malaria parasite detection. The proposed approach can be analyzed with the data set and categorize the (HSV) histograms, and HSI hue channel histogram using the classification approach and there include the procedure for identification of plasmodium in red blood cells. Back propagation feed forward neural networks are to be used to accomplish the end results. The algorithm will improve the accuracy of red-blood-cells (RBC) classification using the proposed approach and compare the accuracy with the existing algorithms.

Keywords: Malaria parasite, Red blood cells, Segmentation, Improvement, Mean outline.

ITP – 2

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Alzheimer's Disease Forecasting using Machine Learning Algorithms

Rajathi N [1], Malavika G [2], Vanitha V [3], Parameswari P [4]

[1,3,] IT Department, Kumaraguru College of Technology, Coimbatore. Email: rajathi.n.it@kct.ac.in

[2] PG Scholar, IT Department , Kumaraguru College of Technology, Coimbatore.

[4,] MCA Department, Kumaraguru College of Technology, Coimbatore.

Abstract

Alzheimer disease is a neurodegenerative disease that makes a gradual disorder of human brain cells and it leads to degenerate the cells away and die. In India more than one million cases per year are affected by this disease. The most common in people over the age group of above 65. There is no treatment for this disease to cure, but now a day's medications are available to temporarily decline the process of disease. The primitive detection of this disease may help the doctors, physician, and other family members to treat them in a better way, for that the scientific technology of this proposed system has been helpful to detect the disease in premature period. The core objective of this proposed system is to provide a fast, early and cost-efficient method to detect disease. Machine learning is the blooming field in the healthcare industry, so by using the machine learning techniques the disease will get forecast in the earlier stage. The techniques are K-Nearest Neighbor, Adaboost Classifier, Support Vector Machine, Logistic Regression, Decision Tree Classifier, Random Forest classifier. Among this algorithm the best accuracy predictor model, most affected gender and age can be determined in this proposed system.

Keywords: Primitive Detection, Accuracy, Machine Learning, Alzheimer's detection.

ITP – 3

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Augmented Reality in Education Using Kinect

Saranya K [1] and Jayanthy S[2]

[1]Assistant Professor, Department of Computer Science and Technology. Kumaraguru College of Technology. Coimbatore.Email: saranya.k.cse@kct.ac.in

[2] Professor,Department of Electronics and Communication Engineering,Sri Ramakrishna Engineering College,Coimbatore. Email: jayanthy.s@srec.ac.in

Abstract

Augmented Reality is a technology that uses an existing environment and superimposes new information on top of it. One of the main millennium goals of the nation is to deliver affordable education. This system is developed to turn boring lectures to magical interaction. It makes learning easier by allowing the students to interact with the materials to be learned. This paper discusses the role of augmented reality in providing interactive models for learning and teaching purposes. Augmented reality makes learning easier by providing real-time interaction and helps the students to understand easier. In recent years, augmented reality plays a vital role in science and medicine. The proposed system is based on the markerless augmented reality which doesn't require any prior knowledge of the users. The concept of augmented reality and integration of Unity and Kinect sensor are discussed.The proposed system consists of an interactive learning module and a gaming assessment module. In this, scores of the students for the gaming assessment module are calculated and displayed. It is implemented using the C# script. The proposed system can also be accessed on mobile phones. The proposed system is a Cloud-based system in which the teachers can access and analyze the assessment score from anywhere and anytime. The student can learn alphabets, words, and pronunciation from the proposed system. This paper explains the need for interactive learning and the advantage of augmented reality in education

Keywords: Augmented Reality, Education, Gaming

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As per the telephonic conversation we had regarding publication of conference proceeding in the ISBN, hereby I am forwarding the proceedings of the AICTE sponsored International Conference on Image Analysis for Human Infectious Diseases. The abstract includes 16 abstract from BT track and 78 abstracts from IT track. Out of this 30 papers were published in BBRC journal and some of the papers were published by the corresponding authors on their own.

ITP – 4

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Block Chain Based Solution to Improve the Supply Chain Management in Indian Agriculture

Sudha V [1] and Kalaiselvi R [2]

[1] Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore
[2] Department of Information Science and Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

India is one of the agriculture-based country in the world. The history of agriculture in India starts from Indus Valley Civilization. But in such a historical country, many farmers are starving for their income while foreign countries are earning lakhs from the same. One of the reasons for the above cause is the very poor supply chain management. It is a well-known fact that most of the farming items decay very fast if not maintained properly. In the existing supply chain management, though the government provide storage houses for the farmers, the farmers could not track the status of their goods. Also, there is no proper system for tracking the status of their goods in the various stages of transportation. Hence, an improved supply chain management is needed with the following properties: there should be a checkpoint at every stage in the supply chain management and these must be verified by both the farmers and the government officials. In this paper, a system is proposed that stores the state of the goods in the decentralized database, Blockchain. By storing the details in the blockchain, all the process is visible both to the farmers and officials involved in the transportation. Also, the records that are immutable can remain forever.

Keywords: Blockchain, smart contract, farmer, supply chain management, goods

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ITP - 5

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A Novel Hybrid Method for Classification of Tumor in Gene Expression Based Central Nervous System Microarray Data

Jai Singh W [1] and Kavitha R K [2]

[1,2] Assistant Professor (SRG), Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: jaisingh.w.mca@kct.ac.in

Abstract

Nowadays, DNA microarray is widely used by researchers to predict cancer disease. In a microarray data, the presence of large number of features and instances makes it difficult to analyse and diagnose cancer. Hence, the selection of features is considered to be a vital task in classifying data. The phenotypical and genotypical behaviour of tumors in the human central nervous system poses a challenge in diagnosing and treating the disease. A clear description of the tumor is necessary to diagnose and treat the disease. Many feature selection methods can be used to identify the genes which are expressed differently in a microarray data. This research proposes a novel method of categorizing tumors present in Central Nervous System (CNS) with the help of DNA microarray gene representation present in the samples collected from patients. This research work aims to blend techniques like Support Vector Machine (SVM), Information Gain (IG) and Principal Component Analysis (PCA). Initially, Information Gain technique was used to select features followed by feature reduction with the help of principal component analysis. Finally, support vector machine was employed to classify the disease as cancer or not. This study was carried out with the popularly used CNS microarray dataset. It can be observed from the study results that the proposed approach proves to be effective in yielding a superior accuracy in classifying the disease with minimal number of genes.

Keywords: Microarray, Feature selection, Dimensionality Reduction, Classification, Support Vector Machine.

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ITP - 6

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A Deep Learning Classifier for Accurate Detection of theNovel Coronavirus

Cynthia Jayapal[1], SathiyaPrakash M[2] and Shiddharth Saran M[3]

[1] Professor, Department of Computer Science, Kumaraguru College of Technology, Coimbatore. Email: cynthia.j.it@kct.ac.in

[2,3] Student,Department of Computer Science, Kumaraguru College of Technology, Coimbatore. Email: sathiya.16cs@kct.ac.in, shiddharth.16cs@kct.ac.in

Abstract

Albeit India witnessed the second slowest 100 to 1000 jump in COVID-19 cases, according to WHO, the number maybe be inaccurate because of the lack of rapid and large-scale testing facilities. According to reports, India is yet to face the gruesome effects of this pandemic as it moves closer to stage 4 of the communityspread.The standardized tests used in the detection of corona virus like RT- PCR or transcriptase-polymerase chain reaction take a minimum of 24 hours to generate useful results with high false negative rates. Multiple periodic tests are required to arrive at a firm confirmation. A more rapid and accurate method of testing that could be produced in-house and immediately put into action is required for the current indian scenario.

Keywords: Covid-19, Image Analysis, Deep learning, Convolutional Neural Networks.

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ITP - 7

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A Deep Learning Based Hybrid Network Intrusion Detection for a Software Defined Network

Dhanabal L [1] and Manikantan M [2]

[1,2] Department of MCA, Kumaraguru College of Technology, Coimbatore. Email: dhanabal.l.mca@kct.ac.in

Abstract

Software Defined Network (SDN) is instrumental for the new generation Internet. SDN is loaded with various salient features with security being one among them. In spite of the enhanced security features, core SDN infrastructure is still prone to network intrusions. In this literature a deep learning based approach is adopted for feature selection to detect anomalous network traffic using Support Vector Machine (SVM). Convulsion Neural Network (CNN) is used to extract effective features from the benchmark Network Security Laboratory Knowledge Discovery in Data Bases (NSL KDD) Dataset. Out of the forty one features, only a very few of the essential attributes are used in this model. The experimental results prove that the proposed deep learning approach best suits for an SDN environment with a better intrusion detection accuracy. The proposed model is implemented in an SDN controller.

Keywords: Intrusion Detection, Software Defined Network, Deep Learning, NSL KDD

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ITP - 8

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E-Archiving and Approval System

Uma Maheswari S[1], Parivel K[2] , Vikraman R[3] and Mukilgautham G[4]

[1]Assistant Professor,Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

[2,3,4] Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

The archiving of the data is the still among the biggest problems for many institutions to store and retrieve the information. The approval system for the events is needed for the faster and to reduce the time consuming process of the traditional methods in the approval system by the usage of the papers and manual data entries. There also a need to store these event or data in database to analyze and also to generate reports based on the database. This approval system helps the user of the system to archive and retrieve the data in the form of the digital document. The developed system uses the integration of the web technology methods and server components to aim at providing the better result in the approval system in form a digital document.

Keywords: User, Event, Approval, Database, Digital document

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ITP – 9

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Human Activity Recognition Using Smartphone Sensors

Latha L[1], Seetha Lakshmi G2 and Selvaharshini E[3]

[1] Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore, Email: latha.l.cse@kct.ac.in

[2,3] Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore, Email: seetha.17cs@kct.ac.in, harshini.17cs@kct.ac.in

Human Activity Recognition is a classifying activity used in many applications such as health care and medical, surveillance and anti-crime securities. It is important to provide correct and exact information regarding the activities of a human. The capabilities and the number of users of smartphones increase day by day. Smartphones are having many built-in sensors like, Global Positioning System (GPS), compass sensor, gyroscope and accelerometer. We can retrieve and use the data generated by those sensors to capture the state or the activity of the user. In this paper, we used the data generated by the smart phones' accelerometer and gyroscope sensors as inputs to recognize some of the activities of a person like running, standing, walking upstairs and downstairs, walking, sitting, lying and the eye movement of the person, using camera and responsive sensors that are present in the Android smartphones.

Keywords: Human activities, machine learning models, recognition, smartphone sensors, success rate.

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ITP - 10

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A Survey on Deep Learning and Machine Learning Approaches used for Intrusion Detection in IoT based health monitoring systems

Vanitha V[1], Ahil M N[2] andRajathiN[3]

[1, 3] Professor, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

[2]Student, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

The Internet has the power of bringing up every people in the nook and corner of the world together. It not only brings people together, but also there are many devices that are connected to the internet which are called the Internet of Things (IoT). IoT is making its impact in every possible field like Agriculture, Healthcare, Automobile, Traffic Monitoring and many others. Especially IoT has numerous benefits in the field of healthcare where it helped in providing an opportunity to the healthcare professionals to continuously monitor the patients with the assistance of IoT devices and the details obtained from the devices helped in providing the patients with some valuable insights. IoT in healthcare is further enhanced with the help of IoT devices and wearables which helps in monitoring the heart rate, sleeping habits, measuring the glucose level in the tear, detecting the asthma attack symptoms and tracking the blood sugar. Currently the pandemic, COVID-19 has also made a massive acceleration in the usage of telemedicine that helps in providing remote medical services to the patients during the lockdown. As IoT develops, security threats to the IoT networks also increases. As all the data that has been generated from the devices will be used for providing insights and some of the devices are even worn by the people, protection of the IoT devices and IoT network is a major concern that must be taken care of. Intrusion Detection System (IDS) is the major solution that helps in detecting the intrusions over the IoT network. IDS are built by incorporating Machine Learning and Deep Learning approaches. Thus, this paper aims at surveying the various algorithms and the datasets that are used for the Intrusion Detection. It also analyses the performance metrics which include precision, accuracy, F1 values and recall of various IDS.

Keywords: Intrusion Detection, IoT, Deep Learning, Machine Learning.

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ITP – 11

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Comparitive Study of Machine Learning Approaches in Diabetes Prediction

Parameswari P[1] , Rajathi N [2] , Priyanka E B [3] , Thangavel S [4]

[1] Department of MCA, Kumaraguru College of Technology, Coimbatore.

[2] Department of Information Technology, Kumaraguru College of Technology ,Coimbatore.

[3, 4] Department of Mechatronics Engineering, Kongu Engineering College, Perundurai. Email: parameswari.p.mca@kct.ac.in

Abstract

Diabetes is a common illness that scares people around the world about their health. In order to prevent and treat diabetics in a better way, biomedical research efforts help. With traditional methods that lead to problems, especially with high levels of complexity and vagueness factors, the handling of large amounts of data is often very tedious. The purpose of this study is to design a model that can predict the probability of diabetes in patients with maximum precision. Therefore, this experiment uses three machine learning classification algorithms, namely Random forest, J48 and Multilayer Perceptron , to detect diabetes at an early stage. Experiments are conducted on data obtained from the UCI machine learning repository that was collected by using direct questionnaires from the patients. On multiple measures such as Precision , Accuracy, F-Measure, and Recall, the effects of all three algorithms are measured. Accuracy is calculated against instances predicted correctly and incorrectly. The results obtained indicates Random forest performs well with the highest precision of 97.5 percent compared to other algorithms but J48 algorithm took minimum time to build the model.

Keywords: Diabetes, Random forest, J48 , Multilayer Perceptron, Machine learning.

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ITP - 12

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Malarial Parasite Identification Using Convolution Neural Network

Kavitha S[1], Sathyavathi S [2], Priyadharshini R [3] and Varshini S [4]

[1,2] Assistant Professor II, Department of Information Technology, Kumaraguru College of Technology, Coimbatore. Email: kavitha.s.it@kct.ac.in, sathyavathi.s.it@kct.ac.in

[3,4,] Student, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

Abstract

Malaria - a dreadful and deadly disease caused by a parasite belong to the plasmodium family that commonly infects a female Anopheles mosquito which bite on humans. With the symptoms, the disease can be diagnosed by trained lab technicians who will examine the microscopic blood smear images. Developing an automatic, accurate and efficient model for detecting this disease will reduce the requirement for the trained human resource and it will improve the diagnosis efficiency. Deep learning neural networks can be used to improve the efficiency and the accuracy of the diagnosis. In this paper, we propose a model using Convolutional Neural Network (CNN) for the examination of malaria from the microscopic human red blood smear images. This model will provide a rapid, accurate, low cost outcome. Our model differentiates the infected and uninfected cell images by training the convolutional neural networks. The algorithm involves the methods and architectures of computer vision, image processing operations and deep learning. The proposed CNN model can examine the malarial parasites from microscopic images with an accuracy of 68.38%, in 10000 checkpoint operations.

Keywords: Plasmodium parasites, microscopic, blood smear, CNN, Deep learning.

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ITP – 13

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Software Module Customization Method to Create Awareness in Irrelevancy Requirements to the ERP Vendors

Hameed Ibrahim S, Assistant Professor (SRG), Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: hameedibrahim.s.mca@kct.ac.in

Abstract

The Enterprise Resource Planning (ERP) project customization is the process of altering the software modules based on user requirements. Customization project during runtime is a most difficult task which can affect the quality of software project modules.In this paper, for discovering the effective degree of customization requirements, Quantitative Win-Win approach is presented. From the user collected requirements, inappropriate requirement applicable for the software development will be removed at run time with the aim of enhancing the performance and it is accomplished with the help of the optimized evolutionary method. Software engineering handles the development of software systems and decreases the cost as well as enhances the development process. Software metric is a measure of software characteristics to which a software system processes some property. With the aim of assessing as well as foreseeing the software quality the features are eliminated from the requirements. This features-based software comprises a strong association with software quality. Faults as well as Execution Time are the characteristics. The cuckoo search Algorithm helps to enhance these attributes to select the finest requirements.

Keywords: Enterprise Resource Planning (ERP), Win-win approach, cuckoo search algorithm

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ITP - 14

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Classification of Mushrooms to Detect their Edibility Based on Key Attributes

Vanitha V [1], Ahil M N [2] and Rajathi N [3]

[1, 3] Professor, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

[2] Student, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

Abstract

Mushroom is found to be one of the best nutritional foods with high proteins, vitamins and minerals. It contains antioxidants that prevent people from heart disease and cancer. Around 45000 species of mushroom are found to be existing in the world-wide. Among these, only some of the mushroom varieties were found to be edible. Some of them are really dangerous to consume. In order to classify the mushrooms as edible and poisonous in the mushroom dataset which was obtained from UCI Machine Learning Repository, some data mining techniques are used. Weka is a data mining tool that has various machine learning algorithms which can be used to pre-process, analyse, classify, visualise and predict the given data. Thus in order to select the attributes that helps in the better classification of mushrooms, Wrapper method and Filter method in Weka are used to identify the best attributes for the classification. The attributes 'odor' and 'spore_print_color' were chosen to be the best ones that contributed to the better classification of edible and poisonous mushrooms. After the identification of the key attributes, classification is performed and decision tree is constructed based on those attributes and its Precision, Recall and F-Measure values are analysed.

Keywords: Classification, Wrapper Method, Filter Method, Key Attributes.

ITP - 15

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Neural Networks in Agriculture: A Survey

Parameswari P [1] ,.Rajathi N [2], Vijay Kumar M [3], Akshaya V S [4]

[1& 3] Department of MCA, Kumaraguru College of Technology, Coimbatore.
[2] Department of Information Technology, Kumaraguru College of Technology, Coimbatore.
[4]Department of CSE, Sri Eshwar College of Engineering, Coimbatore .
Email: parameswari.p.mca@kct.ac.in

Abstract

In many fields, including agriculture, neural networks have become a very effective method. In this paper, we discuss the applications of neural networks in the field of agriculture, including their advances, specifically in classification, decision-making, pattern recognition, crop yield prediction, plant identification, classification of weed images, remote sensing, identification of plant diseases, precision farming, and agricultural enhancement spatial data analysis.Among these, computer techniques in the field of agriculture are also based on neural networks, especially in the sense of soil and water. The survey was used to convey information about applications, processes, future innovations and challenges in applyingArtificial Neural Network (ANN) techniques in agricultural innovations.

Keywords: Artificial Neural Networks, Agriculture, Soil Classification, Crop Management, Plant Disease.

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ITP - 16

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Fake Currency Note Detection Using Image Processing

Latha L[1], Raajshree B [2], Nivetha D [3] and Kishore R [4]

[1] Professor,Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore
[2,3,4]Student Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: raajashree.17cs@kct.ac.in, nivetha.17cs@kct.ac.in, kishore.17cs@kct.ac.in

Abstract

In market fake currency is the most important problem that speaks a lot. Due to the growth of technology, the fake currency production has been increased which degraded the economy of our country. Here the suggested method uses OpenCV to recognize whether the given note is original or fake. It consists of machine learning techniques that are carried out using suitable mechanisms. A fake currency detection method is introduced which uses the edge detection to detect the lines accurately and also accurately detect curves of acceptable notes. Here we use a detector that is trained with the help of stored information which is similar to the one that is to be tested or compared later; within those modules, anchor lines are defined that are further depicted in subsequent test patterns. In order to provide training for the detector in offline a microprocessor is programmed. This is done with an sample currency obtained by scanning given note into our proposed method, here a frame like design is obtained by training image format.Then, notes similar to obtained frame are to be identified. Inside the template, the microprocessor determines anchor lines that are further depicted in that test format; it spin and moves the design before it matches to the training format, so that anchor lines which corresponds to the line can be identified in that trained dataset i.e. the pattern designed; and compares them with the test format to know if those anchor lines lies inside that test format.

The system is proposed in a way that it shows if the currency is fake or it is original. We all know that Currency occupies an important place in our existence and hence it is very important for us to check its uniqueness. This system is useful in India because they use the paper currencies more.

Keywords: Image processing, Currency, Edge Detection, Grayscale.

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ITP - 17

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Product Recommender System Using Collaborative Filtering

Bharathipriya C [1], Aswini D [2], Kirubakaran R [3] and Swathi B [4]

[1,2,3] Assistant Professor, Kumaraguru College of Technology, Coimbatore. Email: bharathipriya.c.cse@kct.ac.in, aswini.d.cse@kct.ac.in, kirubakaran.r.cse@kct.ac.in

[4] PG Scholar, Kumaraguru College of Technology, Coimbatore. Email: swathi.18mcs@kct.ac.in

Abstract

There is a rapid increase of data on internet, to enhance the search result as required and give the better results based on their personalization we introduce Item Of Interest (IOI). Recommender System (RS) is an engine used to predict the future interest of set of item for user and suggest top N items. New methods in Recommender System are required to evolve change in finding the Item Of Interest (IOI) and reduce data sparsity problem. Recommender Systems are used in many streams such as product sales, recommending websites, books, movies, etc. The three types of RS are Collaborative Filtering (CF), Content based Filtering (CBF), and Hybrid Filtering (HF). In this work we are experimenting Item Based Collaborative Filtering. Item Based Collaborative Filtering is a technique where we acquire information from item and process them to predict the item of interest (IOI). We used three clustering technique to form clusters among products. Amazon dataset is used to experiment our work. Finally, we evaluated the experimental result using Root Mean Square Error (RMSE) and Mean Absolute Error (MAE).

Keywords: Personalization, Item of Interest, Data sparsity, Clustering technique.

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ITP - 18

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Study of Forest Cover Change Detection Using Data Analysis Methods

Shenbagam P[1] , Harini T[2] and Rajkumar N[3]

[1] Assistant Professor II, Department of Information Technology, Kumaraguru College of Technology, Coimbatore. Email:shenba2k1@yahoo.co.in

[2] Department of Information Technology, Kumaraguru College of Technology, Coimbatore. Email: harini.19mds@kct.ac.in

[3] Department of Computer Science and Engineering, Hindusthan College of Engineering and Technology, Coimbatore. Email: nrk29@rediffmail.com

Abstract

Deforestation have a negative impact on climate change and environment, which in turn affects the species including humans. Forest cover area is directly linked with deforestation. The purpose of this study is to assess the dimension of forest cover changes and analyse the responsible factors. This also examines the environmental impact experienced soon. The study was conducted based on the Statistical Yearbook of India in 2016 for Environment and Forest. The change in forest cover was analysed using the data collected from magazines, books, internet, and newspapers employed with various data analysis methods. This study illustrates that the forest cover in the world is varying compared with the previous years. This also has a great impact on the human population in that area. Better understanding of forest cover and its relationship with human life will contribute more towards reducing deforestation.

Keywords: Land use, land cover, change detection, forest management, deep learning, GIS.

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ITP – 19

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Agri Image Processing Using UML Model

Suguna M[1], Nithya Priya s [2] and Thenmozhi G [3]

[1]Associate Professor, ISE Department, Kumaraguru College of Technology, Coimbatore.

[2]Asst Professor (SRG), Biotechnology Department, Kumaraguru College of Technology, Coimbatore.

[3]Associate Professor, Automobile Department, Kumaraguru College of Technology, Coimbatore.

Abstract

Agri image processing is an undertaking which points in building up a mechanized framework to separate and investigate leafy foods as great and terrible through an image handling framework. To check the nature of Agri-products through image processing handling utilizing MATLAB ide. It points in lessening human endeavors in the field of farming where there is an enormous region of land and it cannot check every yield physically, in this way fruits quality to check the nature of the product. Generally, this task of own is being created to support the customers, Businesspeople and Industrialists spare their time. It additionally helps in conveying great quality items to the Clients. This venture is helpful for both the merchants and purchasers of Agri-items.

Keywords: Agri product, Fruit Analysis, Fruit, Sorting, Grading, PSNR

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ITP – 20

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Ranking Based Recommendation and Securing Social Media

Uma Maheswari S [1], Mayuri P T [2], Abirami P V and Adhersha T L [4]

[1]Assistant Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: umamaheswari.s.cse@kct.ac.in

[2,3,4]UG Students, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: mayuripalanisamy2299@gmail.com, abiramivenkatachalam1998@gmail.com, adhershatl898@gmail.com

Abstract

In this application customized suggestion is urgent to help clients in finding appropriate data. A few anonymization strategies, for example, speculation have been intended for security saving information distributing. Record compromization is a genuine danger to clients of online web-based media information distributing. In this project, we proposed PrivRank, an adaptable and nonstop security safeguarding internet-based life information distributing structure ensuring clients against surmising assaults while empowering customized positioning based proposals. A social conduct profile precisely mirrors a client's web-based media movement designs. While a real proprietor adjusts to its record's social conduct profile automatically, it is hard and expensive for impostors to fake. In this project, we enhance the first computational mechanism to resolve conflicts for multi-party privacy management in Social network that is able to adapt to different situations by modeling the concessions that users make to reach a solution to the conflicts. Contrasted with cutting edge approaches, PrivRank accomplishes both a superior security assurance and a higher utility in all the positioning based suggestion use cases we tried. Opinion Mining technique is been used to filter among the good and bad comments by Porter Stemming algorithm.

Keywords: Data Publishing, Intrusion Detection, Opinion Mining, PrivRank

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ITP - 21

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Classification of Cyber Attack Using Various Supervised Machine Learning Algorithms and Comparing their Performance Accuracy

Kirubakaran R [1], Francis Jency X [2] and Archana Devi V V [3]

[1,2]Assistant Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

[3] M.E, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

Email: kirubakaran.r.cse@kct.ac.in, francisjency.x.cse@kct.ac.in, archanadevi.18mcs@kct.ac.in

Abstract

In the digital world, internet-based attacks (cyber-attacks) are increasing speedily and the condition of internet-based attacks (cyber-attacks) is affirmative. so there is a need for robust security techniques to battle the increasing complex nature of cyber-attacks. Thus, to prevent the tampering of data, an efficient approach to handle the cyber-attack is to be found. Advancements in machine learning can play a major role in digital security and so machine learning concepts and algorithms can be applied to classify the intrusion of various cyber-attacks. This research incorporates the application of various supervised machine learning algorithms like Support Vector Machine (SVM) and Decision Tree for classifying cyber-attack. The results of this research will provide a comparative analysis of the efficiency of different supervised machine learning algorithms in classifying cyber-attacks. The competence of the algorithm is measured based on several parameters like accuracy, precision, recall and f-measure values. Hence, these parametric values will guide the comparative analysis of efficiency of different supervised machine learning algorithms in classifying cyber-attack intrusion.

Keywords: Cyber Attack, Digital Security, Supervised Machine learning, Support Vector Machine, Decision Tree

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ITP - 22

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Smart Bin Collection System

Devaki P [1], Sruthi G [2], NekaMali K [3] and Minu Priya R [4]

[1]Professor[2,3,4] Student Computer Science & Engineering Department, Kumaraguru College of Technology, Coimbatore. Email: devaki.p.cse@kct.ac.in, sruthi.16cs@kct.ac.in, nekamali.16cs@kct.ac.in, minu.16cs@kct.ac.in

Abstract

With population and urbanization growing exponentially, waste generation has also been increasing at the same rate if not more. This has become a difficult issue for many developing countries to tackle. The dustbins in the streets get filled to a point where they overflow. There is no timely collection of waste which leads to many problems to the health of the public. These uncovered overflowing bins serve as a breeding ground for mosquitoes and germs resulting in the spread of diseases. Hence, we developed an IOT based system using an Arduino UNO board fitted with sensors like Ultrasonic sensor, PIR sensors to address this problem. Our 'Smart Bin Collection System' will notify the concerned authority using GSM and GPS modules when a bin is filled beyond a threshold value. The system will also use shortest path algorithms and priority scheduling to facilitate efficient waste collection.

Keywords: Arduino UNO, Ultrasonic sensor, PIR sensor, Knapsack problem, IOT, GPS, GSM, Priority scheduling

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ITP – 23

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The Achromatic and b-chromatic number of the of Splitting Graphs

Thilagavathy K P [1,]Santha A [2] and Devaki P[3]

[1] Assistant Professor, [2] Associate Professor, [3] Professor, Kumaraguru College of Technology, Coimbatore. Email: thilagavathy.kp.sci@kct.ac.in, santha.a.sci@kct.ac.in

Abstract

Let the splitting graph of a graph which can be obtained by taking a new point for each point of and joining to all points of adjacent to In this study, the b-chromatic colouring and the achromatic colouring of the splitting graphs of double star graph, path, star graph, comb graph and complete graph are discussed. Along with this, the investigation of the properties of these graphs are also done.

Key words: Achromatic number, b-chromatic number, Splitting graphs, Star graph, Comb graph, Complete graph

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ITP – 24

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A Hybrid Approach for Autism Spectrum Disorder Classification

Jalaja Jayalakshmi V [1] and Geetha V [2]

[1]Assistant Professor, [2] Professor, Department of Computer Applications, Kumaraguru College of Technology, Coimbatore.

Abstract

Autism spectrum disorder (ASD) is a neurological condition that can be devastating to the social functioning of the affected person. It is attributed to a range of symptoms that include troubles in social interaction, difficulty in expressing themselves and repetitive pattern filled behavior. People with autism have a unique behavioral pattern and the severity of the disease may vary across individuals, the causes for which are not known. The prevalence of ASD is increasing globally and early diagnosis of the disorder can lead to substantial behavioral improvements. Machine learning techniques are widely used in the health care domain for medical diagnosis. The study focuses on applying machine learning ensemble techniques to autism adult data sets to predict autism in adults. Results indicate that the hybrid model improves the performance of autism data classification.

Keywords: Machine Learning, Ensemble, Autism

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ITP – 25

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Predicting Metamorphic Changes in Parkinson's Disease Using Machine Learning Algorithms

PremaArokia Mary G [1], Suganthi N [2], Hema M S [3], Hari Dharshini [4], Vaishaali [5] and Monika Sri M [6]

[1]Assistant Professor, Department of Information Technology, Kumaraguru College of Technology, Coimbatore
[2]Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore
[3]Professor, Department of Computer Science and Engineering, Aurora Scientific, Technological and Research Academy, Hyderabad, India
[4,5,6] Student, Department of Information Technology, Kumaraguru College of Technology, Coimbatore

Abstract

Parkinson's disease is a nervous disorder mainly it affects the motor activities of the human body. Manifestations start step by step; at later point it becomes the greatest obstacle to do our day to today activities. Individuals influenced with Parkinson's ailment should go through lifestyle changes and enthusiastic changes like dozing issues, disposition swings, stultification, and skin issues. The proposed methodology is to analyse the proportion of metamorphic changes of a person affected by Parkinson's disease using machine learning techniques. Principal Component Analysis (PCA), recurrent neural network and logistic regression algorithms are used for prediction. The accuracy, precision, recall and F1 measure is used to assess the performance of the prediction algorithms. The dataset includes activities of daily living which from PPMI (Parkinson's Progression Markers Initiative) was taken for experimentation. Logistic regression can predict metamorphic changes with a higher accuracy of 92% for sleep dataset and 95% for Olfactory(smell) dataset when compared to other two algorithms.

Keywords: Metamorphic changes, Hallucinations, Machine Learning, PCA, RNN, Logistic Regression, Transformation, Normalization, Prediction.

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ITP – 26

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Face Generation using Deep Convolutional Generative Adversarial Neural Network

Devaki P [1], Prasanna Kumar C B [2], Kaviraj S [3] and Ramprasath A

[1] Professor, Department of Computer Science, Kumaraguru College of Technology, Coimbatore. Email: devaki.p.cse@kct.ac.in

[2, 3, 4] Student, Department of Computer Science, Kumaraguru College of Technology, Coimbatore. Email: prasanna.16cs@kct.ac.in,. kaviraj.16cs@kct.ac.in,ramprasath.16cs@kct.ac.in

Abstract

Due to the huge availability of data, it is difficult to classify/process images at a higher speed and accuracy. The first technique was in the field of computer vision and it used image data for face recognition and detection of an object from the image but later Convolutional Neural Networks (CNNs) took place. CNNs are used for feature detections by looking at the image and try to check if certain features are present in the image and then it classifies the image accordingly. Acquiring and processing the dataset for the Machine learning technique is one of the time-consuming processes, so Generative Adversarial Neural Network (GAN) are introduced. GAN typically work with image dataset but they are difficult to train. This paper explores the potential of GAN to generate realistic images. Deep Convolutional Generative Adversarial Networks (DCGAN) is used to generate new images that are not in the dataset. DCGAN has a great success in generating the new images. MNIST (ModifiedNational Institute of Standards and Technology dataset)contains images of handwritten digits dataset and CelebA dataset contains images of celebrities are used, performing the adversarial learning on it and try to generate new images as same as the MNIST and CelebA datasets.

Keywords: Convolutional Neural Networks, Generating images, MNIST, CelebA, Deep Convolutional Adversarial Neural Networks.

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ITP – 27

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Speed Breaker Detection for Autonomous Vehicles Using Deep Neural Networks

Bharathi M [1], Amsaveni A [2] and Sasikala S [3]

[1, 2, 3] Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore. Email: bharathi.m.ece@kct.ac.in

Abstract

Most commonly road accident happens due to increased number of unmarked speed breakers. The unmarked speed breaker on national highways is the major threat to the vehicle drivers. The drivers will not be able to recognize the unmarked speed breakers and will tend to lose the control of the vehicle. An intelligent transportation system is needed for the safe driving of the vehicle. Advance driver system in the modern vehicles is used to warn the driver about the approaching speed breakers. Self-driving autonomous cars need to predict the road anomalies without any human intervention. This creates a need for accurate detection of speed breakers and other abnormalities on the road in real time for safety and comfort travelling. Use of GPS, accelerometer and magnetometer are few common methods proposed in the literature for the identification of speed breakers. In this paper real time detection of speed breaker using deep Neural Networks is implemented.

Keywords: Accelerometer, GPS, Image Processing, Convolutional Neural Networks, Deep Learning

ITP – 28

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Survey on BlockChain Technology and Key Management for data security

Saranyah V [1] and Suganthi N [2]

Research Scholar [1], Assistant Professor (SR Grade)[2], Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: saranyah.19phd@kct.ac.in, suganthi.n.it@kct.ac.in

Abstract

Blockchain Technology is playing a major role in the current scenario of technical world. It makes the securing of data important in the distributed systems. Blockchain was introduced as the backbone of bitcoin in the early days. But it had given the hope to extend its usage in every fields where secure distribution of data is main concept. The data to be sent securely means to encrypt it with a key which is known to the sender and receiver alone. At the same time these keys are to be managed in an authenticated way. Key management is very well known but the constant changes in the technologies makes it more important to be improved. In this paper, we are going to give a detailed survey on architecture of blockchain and key management over decentralized environment.

Keywords: Blockchain Technology, Distributed Architecture, security, Key management.

ITP – 29

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Significant improvement of Hit ratio and Byte Hit Ratio by combining Web-caching and Web-Prefetching methods

Baskaran K R [1], Vijilesh V [2] and Saroja M N [3]

[1] Professor, Department of CSE, Kumaraguru College of Technology, Coimbatore.
Email: baskaran.kr.it@kct.ac.in
[2] Associate Professor, Department of IT, Kumaraguru College of Technology, Coimbatore.
Email: vijilesh@kct.ac.in
[3] Assistant Professor, Department of IT, Kumaraguru College of Technology, Coimbatore.
Email: saroja.mn.it@kct.ac.in

Abstract

The need for data available on the Internet is growing rapidly and it is expected that more than 70% of the world population will be using it in the coming years. Even though it is true that considerable improvement in technology and infrastructure has taken place in this sphere, it is also true that the delay experience by users in accessing the information from the Internet due to ever increasing data traffic can be significantly improved. To materialize this improvement, frequently used and relevant data shall be stored in cache memory. To achieve this minimization in the delay and to improve the Hit Ratio and Byte-Hit-Ratio, in this paper, we combine Web-prefetching and Web-caching methods. Pre-fetching is achieved with the help of clustering, and the Least-Recently-Used feature is combined with the various classifiers, viz., SVM, J48 and Neuro-fuzzy techniques to achieve Web caching. The Hit-ratio (HR) and Byte-Hit-Ratio (BHR) are measured, and their accomplishment is compared among the said combinations of methods using the real-world dataset to prove the suggested improvement.

Keywords: Classification, Support, Confidence, Support Vector Machine, J48, cache memory

ITP – 30

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Traffic Congestion and Detection using Image Processing

Dhivya Praba R[1], Kavitha K[2], Thilagavathi K[3], Jasmine K[4] and Kalaiselvi A[5]

[1,3,4,5]Assistant Professor, [2]Professor, Department of ECE, Kumaraguru College of Technology, Coimbatore. Email: dhivyapraba.r.ece@kct.ac.in, kavitha.k.ece@kct.ac.in, thilagavathi.k.ece@kct.ac.in, jasmine.k.ece@kct.ac.in, kalaiselvi.a.ece@kct.ac.in

Abstract

Road traffic congestions remains a challenging problem in most of the countries around the world. Traffic congestion dependent on many factors like peak time, Festival days, weekends, bad weather, or unpredictable crisis like collisions and constructional activities. It results in a massive delay in travel, increased fuel wastage, economic losses, pollution, and various health issues to the public. Robust and reliable traffic surveillance is the most economical technique for monitoring road traffic control and management. This study detects traffic congestion from camera images. The proposed traffic surveillance system estimates the traffic by performing vehicle detection and counting. First, the captured pictures are processed by image enhancement techniques. we extract ROI (region of interest) from the traffic video using background subtraction and edge detection. The system will measure the traffic density at each lane and accordingly the number of vehicles was identified at each lane. This can be used to control the traffic signals dependent on traffic intensity. Diminishing of traffic blockage improves the safety, avoidance of accidents, and reduction of environmental pollution.

Keywords: Traffic congestion and control, Image processing, Edge detection, Image enhancement, background subtraction, deep neural networks.

ITP – 31

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Prediction of Autism Spectrum Disorder Using Rough Set Theory

Geetha V [1] ,V.Jalaja Jayalakshmi [2]

[2] Professor, [1] Assistant Professor, Department of Computer Applications, Kumaraguru College of Technology, Coimbatore.

Abstract

Autism Spectrum Disorder (ASD) is a neurological disease that starts early in childhood and persists throughout a person's life. It is a condition linked with brain development and influences a person's behaviour and their interaction with others. Autism has a wide range of symptoms which can vary from person to person. There is no direct medical test to diagnose ASD disorder and hence trained physicians are needed to oversee the person's behaviour development to detect it. There is no cure for ASD, and early detection of the illness will be able to make significant quality improvements in the behaviour of the affected person. Machine Learning techniques are widely used to identify the factors associated with the disease, thus helping in early detection.

This paper attempts to explore the possibilities of analyzing the autism data sets of adults using rough set theory and predict the main factors associated with the disorder for providing an early treatment. A comparative performance analysis of the results is done using two rough set algorithms, and the results indicate that the genetic algorithm gives a better performance in this domain.

Keywords: Machine Learning, Rough sets, Autism Spectrum Disorder

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ITP – 32

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Order of Vertices of Comb Graph and Helm Graph with respect to Incidence Topology

Vijeta Iyer[1], Santha A [2] and Devaki P[3]

[1] Assistant Professor, [2] Associate Professor, [3] Professor, [1,2] Department of Mathematics, [3] Department of Computer Science and Engineering Kumaraguru College of Technology, Coimbatore.
Email: vijetaiyer.sci@kct.ac.in, santha.a.sci@kct.ac.in, devaki.p.cse@kct.ac.in

Abstract

The order of elements of a topological space with topology as incidence topology generated by Comb graph and Helm graph has been presented in this paper. Various results based on connectedness and separation axioms of the incidence topology generated by these graphs have been discussed. Moreover, order of these nodes w.r.t the incidence topology has been established and generalized for these special graphs and supporting examples are illustrated along with the results.

Keywords: graph theory, topological space, order of an element in a topology, incidence topology, helm graph, comb graph, clopen set.

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ITP – 33

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Order of Vertices of Path Graph and Star Graph with respect to Incidence Topology

Santha A [1], VijetaIyer [2] and Devaki P[3]

Associate Professor [1], Assistant Professor [2], Professor [3], [1,2] Department of Mathematics, [3] Department of Computer Science and Engineering, Kumaraguru College of Technology, Tamil Nadu, Coimbatore, India. Email: santha.a.sci@kct.ac.in, vijetaiyer.sci@kct.ac.in, devaki.p.cse@kct.ac.in

Abstract

In this paper, the order of elements of a topological space with topology as incidence topology generated by simple undirected Path graph and Star graph has been studied. Various results based on connectedness and separation axioms of the incidence topology generated by these undirected graphs have been discussed. Moreover, order of these nodes w.r.t the incidence topology has been established and generalized for these graphs and sufficient examples are illustrated to support the results.

Keywords: graph theory, topological space, order of an element in a topology, incidence topology, star graph, path graph.

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ITP – 34

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Smart Home Door Unlocking System using PIC16F877A

Mohana Sundaram S[1,] Mohan Kumar N [2], Arunkumar S [3]

[1] Student , [2,3]Assistant Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore. Email: mohanasundaram.nms@gmail.com, akumar5989@gmail.com

Abstract

The Internet has become an integral part of human's life in such a way, that most of the applications become helpless without internet. To make most use of this, this paper proposes a smart unlocking mechanism for doors of high security importance. This is made possible by employing IoT Technology, which not only controls, but also effectively monitors electrical and mechanical system. By this method, the doors are operated using mobile app, even at remote places. A hardware prototype has been developed and tested by integrating Special Electrical Machines, PIC Controller and GPS Module. The results seem to be satisfactory, by providing a smart and secured way of door control.

Keywords - IoT, GPS Module, PIC Controller, Automation, Smart Unlocking System.

ITP - 35

Smart Wheelchair Controlled by Eye Movement

Shivapriya S N[1], Maheswari K[2], Rahulkumar S[3], Indhumathi S[4], Sivasurya S V[5]

Kumaraguru College of Technology, Coimbatore. Email: shivappriya.sn.ece@kct.ac.in

Abstract

Wheel chairs plays an important role for the persons who are physically challenged. The wheel chairs which are now available are controlled by a joystick control system. These conventional wheel chairs operate only with the help of hand so that the user can move in a particular direction. It is very difficult for the totally paralysis persons to use such type of system because paralyzed persons cannot be able to move hands. In such cases their eye movements will help them to move in desired direction. This work aims to develop a smart wheel chair which is controlled by eye movement of the user. Eye tracking can be done by processing the image of an eye using MATLAB. The face images of the user are continuously captured by webcam. The captured images undergo image processing technique which will be carried out using MATLAB. The corresponding commands will be sent to the microcontroller based on the pupil direction in the selected contour. The motions of the eyes therefore control the directions in which the wheels start the movement.

Keywords: Eye tracking, Web camera, Image processing, Micro-controller.

ITP - 36

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Performance Comparison of Pan Tompkins and Wavelet Transform Based Ecg Feature Extraction Techniques

Shivappriya S N [1], Maheswari K[2] and Harikumar R [3]

[1,2]Kumaraguru College of technology, Coimbatore, India. Email ID: shivappriya.sn.ece@kct.ac.in
[3]Bannari Amman Institute of Technology, Sathyamangalam, India

Abstract

Electrocardiogram (ECG) signals represent the heart's electrical activity in terms of P-QRS-T wave components. It is necessary to denoise and extract the components from the raw ECG signal, which is fetched from the electrodes placed on the human chest. This work compares the Pan-Tompkins and Wavelet transform Technique for extracting predominant features from the ECG signals. The fiducial points like amplitude, time period, ECG signal's onset and offset points are detected based on the windowing, thresholding Techniques. The accurate delineation takes place with appropriate scaling and wavelet functions. The various performance parameters like sensitivity, positive predictivity and accuracy are used to compare these feature extraction methods. The accurate feature extraction will give the accurate information about the heart functioning, which will improve the exact detection of the ECG signal wave components, diagnosis, and treatment.

Keywords: ECG, Pan Tompkins, Wavelet Transform, Detection, Delineation

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ITP – 37

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Deep Learning Approach to Identify Abnormalities in Blood Cell Images: A Review

Nithya Roopa. S[1], Sandra. J [2], Sherin. J [3] and Mary Magdalene Jane F 2

[1,2,3] Department of Computer Science and Engineering, Kumaraguru College of Technology, India
[4] Department of Computer Science with Data Analytics, Dr. N.G.P. Arts and Science College, India

Abstract

Imaging blood cells exhibit salient diagnostic information concerning abnormalities in an individual's genomic sequence. Deep Learning models aid in extracting complex insights from input images owing to their multi-level structures. Convolutional Neural Networks (CNN) is a prevalent deep learning approach for blood cell classification owing to automatic feature extraction. Recurrent Neural Network (RNN) is used for the classification of blood cells as it captures long-term dependencies between entities. A review of the existing works using CNN and CNN-RNN based models for blood cell image classification is presented in this paper.

Keywords — CNN, RNN, Image classification

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ITP – 38

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Design and Development of Electric Scooter

Venkatesh B [1], Lokitha T [2], Arun Kumar S [3] and Sasikala S [4]

[1,2] Second year, [3]Assistant professor, [4]Associate Professor, ECE, Kumaraguru College
of Technology, Coimbatore. E-Mail: lokitha.18ec@kct.ac.in,arunkumar.s.ece@kct.ac.in

Abstract

Electric vehicles are becoming more important as not only to reduce carbon emission but also to reduce the dependency on normal combustion engine vehicles. Most of the universities have really big campuses. The distance between each of the departments varies from 600 to 2000 meters which is a big distance to walk through and it consumes time.To make the mobility in campus easier, the harmless and power-controlled vehicle with safety technologies can be used which reduces time consumption. Further, it aids differently abled persons and aged professors. This paper presents the design and development of a compact, portable and weightless electric skating scooter. The vehicle body design is inspired from the sea cartilaginous fish 'String Ray'. It also includes mechanical features like front shock absorber, handlebar break control, portable and handle bar height adjustment. The electrical and electronic features such as obstacle detector, fingerprint and RFID access, battery management system etc., helps towards building a smart vehicle. Besides, it also provides a vehicle management system for tracking the user details, location and condition of the vehicle through a server. The proposed system with addition of mechanical, electrical and electronic features will help towards enhancing the performance of an electric scooter for easy mobility.

Keywords — In campus locomotion, weightless, vehicle management system.

ITP – 39

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Awareness of Student's wellness in COVID'19 lockdown

Maheswari K [1], Chandrakala.D[2], Kiruthika. J [3]

[1]Department of Mathematics (S&H), Kumaraguru College of Technology, Coimbatore-49
[2]Department of Information Science, Kumaraguru College of Technology, Coimbatore-49
[3]Department of Computer Science, Kumaraguru College of Technology, Coimbatore-49

Abstract

The objective of this paper is to identify and analyse the students' wellness with regard to health, fitness and psychology in the advent of COVID'19 lock down period. The analysis of the survey data identifies the key points about the respondents' attitude towards awareness in health with respect to proper diet, fitness, sleeping rate, depression and usage of devices. Based on all these attributes, correlation has been drawn in the respondents' health and mental stability as well as respondent's sleeping rate and usage of mobile devices. A predictive data analysis underlies the values concerning the individual responsibilities towards health and studies and the same has been showcased in the post COVID'19 in order to foster the respondents' mind set. Finally, two simulation examples are rendered for the effectiveness of the proposed method.

Keywords: COVID'19 lockdown, students' wellness, statistical analysis, correlation, data analysis,

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ITP - 40

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Wellness Survey Analysis amidst student community in the Pandemic Time

Maheswari K[1], VijetaIyer[2], Shivapriya S N[3] and Vijilesh Vijayan [4]

[1,2] Department of Mathematics (S&H), Kumaraguru College of Technology, Coimbatore
[3]Department of Electronics and Communications Engineering, Kumaraguru College of Technology, Coimbatore
[4] Department of Information Technology Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

This paper reports the results of students' survey analysis of all the branches of Engineering students' regarding their wellness with respect to their mindset, diet andthe students' mental stability during this the lock down period. At the advent of COVID'19, the respondents exercised the usage of smart devices in a more effective manner and at fewer times got frustrated staying at home for long hours and leading a monotonous life. The survey inquired about accessibility of network issues faced during the pandemic and most of the respondents were trying to keep themselves busy by getting involved in various activities like helping their parents in household, by participating in online courses, webinars, reading books, watching documentaries and other entertainment programmes. The survey has also drawn attention towards the student future concerns' and aspirations.

Keywords: COVID'19 lockdown, students' activities, statistical analysis, data analysis on various factors

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ITP – 41

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A Enhanced Framework to Improve Agriculture based Information System

Jayakanthan N[1], Manikantan M[2] and Hari Prasad K[3]

[1] Assistant Professor (SRG), Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: jayakanthan.n.mca@kct.ac.in

[2]HOD/MCA, Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: manikantan.m.mca@kct.ac.in

[3]Department of Computer Applications, Kumaraguru College of Technology, Coimbatore Email: Hariprasad.18mca@kct.ac.in

Abstract

Agriculture is a significant profession in India. The farmers are back bone of our country. But this community facing various issues like starvation, water crisis, insect attacks and pricing. In this section we developed a system "INFARM" it to provide correct information in correct time to the farmers. We development an algorithm "ULAVAN" to analyze the various features and provide right information to the farmers. This system address the various issues faced by the farmers.

Keywords: Agriculture, Farmers, INFARM, Ulavan

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ITP – 42

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Malicious URL Detection using Rule based Optimization Techniques

Jayakanthan N[1] and Anuvarshini R M[2]

[1] Assistant Professor(SRG), Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: jayakanthan.n.mca@kct.ac.in
[2] Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: anuvarshini.18mca@kct.ac.in

Abstract

The suspicious URL cause harms to users dealing with online tractions. Such malicious URL to be analyzed identified and blocked. In this paper we prose rule based model DETECTX to detect the malicious URL. This algorithm analyses various features of the URL for classification. The experimental result shows the efficiency of the proposed system.

Keywords: Malicious URL, Rule based classification, URL detection and web page detection.

ITP – 43

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Heart Disease Prediction using Machine Learning Algorithms

Malavika G[1] , Rajathi N[2] ,Vanitha V[3] and Parameswari P[4]

[1] PG Scholar, IT Department ,Kumaraguru College of Technology, Coimbatore
[2,3] IT Department ,Kumaraguru College of Technology, Coimbatore
[4] MCA Department, Kumaraguru College of Technology, Coimbatore

Abstract

The rapidly growing field of data analysis plays a significant role in healthcare. The healthcare industry has become big business. The healthcare sector produces enormous amounts of data every day. This data helps to extract the hidden information, which is useful to predict disease at the earlier. In medical field, predicting heart disease is treated as one of the intricate tasks. Therefore, there is a necessity to develop a decision providing system to predict the heart disease. Machine learning plays a vital role in disease prediction. In this paper, various machine learning methods were used to predict the heart disease and their performances were compared. The results obtained show the superiority of the Random forest algorithm.

Key words - Heart disease, Machine Learning, Classification Accuracy

ITP – 44

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Classification and Forecasting Model for Covid -19 Disease Severities based on Medical Diagnosis using Weighted Average Dynamic Time Warping Technique

Gopalakrishnan Balasubramanian [1], Manikantan M[2] and Purusothaman Parthasarathi[3]

[1] Associate Professor, Department of Information Technology, Bannari Amman Institute of Technology, Sathyamangalam, Erode. Email: gopalakrishnanb@bitsathy.ac.in
[2] Associate Professor, Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: manikantan.m.mca@kct.ac.in
[3] Assistant Professor, Department of Information Technology, Bannari Amman Institute of Technology, Sathyamangalam, Erode. Email: purusothaman@bitsathy.ac.in

Abstract

Due to Covid-19 pandemic, mankind was affected with respect to mental and physical stress. The causes of the disease have to be analysed based on the correlation factors such as Medication, Age, Gender, physical fitness and habits. In this paper we have proposed a classification model based on weighted average dynamic time warping approach to detect the disease severity as High, Medium, and Low by considering the multi-variant dependent variables that affect the prediction of Covid -19 positive cases. We also proposed the forecasting model based on the time series exponential moving average to identify the growth of disease with respect to Age, Gender and Medical history of the covid-19 positive patient. The results are obtained by defining the correlation function to measure the disease severity in the range of High, Medium and Low. The time series analysis is done with respect to mean average disease severity and also number of positive cases. The forecasting is performed based on the age, gender and existing disorders in health. The results are analysed with other time series classification models such as weighted time wrapping to make the model fits maximum to the available input.

Keywords - Covid-19 Symptoms, Time series analysis, Classification, forecasting, Weighted Average Dynamic Time Wrapping

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ITP – 45

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A study on the effectiveness of machine learning algorithms in early prediction of diabetics among patients

Kavitha R K[1]and Jaisingh W[2]

[1, 2] Assistant Professor(SRG), Department of Computer Applications, Kumaraguru College of Technology, Coimbatore. Email: kavitha.rk.mca@kct.ac.in, jaisingh.w.mca@kct.ac.in

Abstract

Nowadays healthcare industry seems to generate enormous data which when analysed using appropriate machine learning algorithms and tools shall provide greater insights of it. Such analysis helps to discover unusual and difficult to diagnose diseases at an early stage thus promising an increased success rate of curing such diseases and reduced medical expenses. This investigation aims to construct a model which will be able to foresee the chances of occurrence of diabetes among patients with greatest precision. Among the various machine learning algorithms which can be used for classifying data, three were chosen for this study and are listed as follows: Decision Tree, Naïve Bayes and Multilayer Perceptron. All the three techniques were applied on the diabetic data set and their performances were analysed using various metrics. Also, the results were compared by varying the k-fold values. Early stage diabetes risk prediction dataset obtained from UCI machine learning repository was utilized in this research work. This study has positively displayed the ability of the predicting patients with early diabetic risks in a large dataset. Among the three classification techniques, multilayer perceptron seems to classify the patient as diabetic or not with a higher degree of accuracy and with a chosen k-fold value of five and eight.

Keywords: Machine learning, Prediction, Early diabetics, Classification.

ITP – 46

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Mining Rare Associative Classification

Siddique Ibrahim S P [1] and Shanmathi J [2]

[1]Assistant Professor, [2] PG Student, Department of computing science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: siddiqueibrahim.sp.cse@kct.ac.in shanmathi.19mcs@kct.ac.in

Abstract

The integration of Association Rule Mining (ARM) and classification results in Associative Classification (AC) that attains higher accuracy than traditional classification algorithms. But it ignores the rare itemsets during mining process. Frequently occurring items will be associated with one another in enormous number ways and can be extracted simply because the items are so common. Extracting frequent rules using ARM is also an imperative field of research. But rare rules occur infrequently and it has a vital part in numerousdisciplines like scientific, evolutionary and monetaryareas. The rare pattern mining gets inclined towards discovery of certain unrevealed/unpredicted occurrences and it is more valuable to learn. Finding rare association rule is like finding a valuable treasure in a ground. This process is a very daunting task but it gives more rewards to the user once it is successful. The main goal of the proposed rare association classification algorithm is to discover the rare rules among the set of itemsets in a database that occur infrequently and useful for further decision making. This chapter summarize various studies and present research on Rare Association Classification.

Keywords: Association Rule Mining, Classification, Associative Classification, Rare rule

ITP – 47

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Plant Disease Detection System for Smart Agriculture

Indhu R [1] and Thilagavathi K [2]

[1] PG student, [2] Assistant Professor, Department of ECE, Kumaraguru College of Technology, Coimbatore, India. Email: indhu.18mco@kct.ac.in, thilagavathi.k.ece@kct.ac.in

Abstract

Indian economy rely on agriculture to a greater extent. In traditional agriculture, the farmers identify the crop diseases with the help of an expert either by direct visual inspection or by sending the diseased images to experts through online services. Also, continuous monitoring cannot be done manually. The main objective is to develop an android application which identifies and classifies three major diseases - Black horse riding, Brown spot and Bacterial leaf steak. In the plant disease detection system, image to be tested is acquired, pre-processed, segmented and classified based on the disease type. The classification is performed using probabilistic linear classifier called Naive Bayes. The application is developed using Android Studio and the programming language used for the development is java. This application identifies the plant disease based on pixel intensities, predicts the plant growth and sunlight condition if it is good or not. It suggests suitable fertilizers and pesticides depending on the disease type. The average accuracy of the developed application is about 80%. The implementation of this system reduces manpower and increases productivity.

Keywords: Android application, Image processing, Naive Bayes classifier, Plant diseases.

ITP – 48

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An Efficient Dynamic Key Generation Architecture for Distributive Wireless Networks

Mathankumar M[1], Thirumoorthi P[2], Tamilarasu Viswanathan [3] and Suryaprakash S[4]

[1,3,4]Assistant Professor, [2]Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore. Email: mathankumarbit@gmail.com

Abstract

Distributive wireless networks are capable of delivering solutions for countless engineering and viable applications. The sensor nodes of these wireless networks tolerate with tons of limitations namely low computation capability, secured data transmission, tiny memory, fractional energy resources, etc. Within this environment any sensor node can initiate the communication over a period, hence **it is imperative to enhance the reliability of data which are communicated.** In a secured communication, diverse numbers of hardware devices are employed for sharing the information wirelessly. Therefore, the dynamic keys guarantee the secureness of data between the diverse numbers of user devices. Here the manuscript deals about **a method of generating dynamic keys for secure communication in a distributed** environment. The dynamic **keys are generated by employing a** hybrid hardware of PRNG (**Pseudo-Random Number Generator) and PUF (Physical Unclonable Function). A hardware platform is preferred to produce the randomly unclonable dynamic keys.**

Keywords – Dynamic key, Secure communication, Distributive wireless networks, Random number generator, Physical unclonable function, Crypto device.

ITP – 49

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Detection and Correction of Node Failures in Wireless Sensor Networks

Umamaheswari S[1] and Savitha Antony W[2]

Department of Electronic and Communication Engineering, Kumaraguru College of Technology Coimbatore. Email: umamaheswari.s.ece@kct.ac.in, savithawilliam@gmail.com

Abstract

Detection of the failure of nodes in Wireless Sensor Networks is being seen as a very big task because there are several factors or threats that leads to node failures and are needed to be corrected. Sometimes failures are caused because the Network topology changes often, the limitation of resources and the network may not be always connected. The proposed system used mainly two schemes that detect node failures which are recognized as Binary and Non-binary feedback measures. This detection scheme is found to be far better in performance compared to other approaches. The Centralized monitoring is an existing method and as it is not applicable to disconnected networks, it is not reliable. This method is found to have 80% lesser communication overhead. The proposed method has around 95% accuracy compared to centralized monitoring. This project approach has high packet delivery ratio, low routing overhead, low average end-to-end delay ratio for packet transfer.

Keywords: Accuracy, Better Performance, Binary and Non Binary feedback, Centralized monitoring, Communication overhead, Security.

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ITP – 50

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Parking Management System

Sathya D[1], I Jeena Jacob[2] , S Nithyaroopa[3], K Praveen[4], A Arun Kumar[5] and G Sanjeevan[6]

[1, 3, 4, 5, 6] Assistant Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. Email: sathya.d.cse@kct.ac.in, praveen.16cs@kct.ac.in

[2]Associate Professor, GITAM School of Technology, GITAM University, Bengaluru

Abstract

The main concern for vehicle owners often is to identify the proper place to park the vehicle at the earliest. In this work, a web-based application is developed and tested to know the availability of different parking slots in certain areas. The web application controlled by the admin consists of various modules ranging from parking allotment to payment status. To implement this, we have used the Apache Tomcat server using the database SQL server. This system will verify the occupancy of parking slots, will provide customers with optional parking slots in a short period and will monitor occupied slots. The convenience of the person driving the vehicle is positively handled which further improves the effective time management with increased effectiveness which also paves way for less energy consumption and pollution.

Keywords: Parking, Slot, Admin, Category, Vehicle, Customers, MYSQL, Apache Manager.

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ITP – 51

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A Study of performance of various FACTS controllers suitable for aiding AGC in Multisource Power System

Mohana Sundaram N[1], Arunkumar S[2] and Rani Thottungal D[3]

[1,2] Assistant Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore, India. mohanasundaram.nms@gmail.com, akumar5989@gmail.com
[3] Professor, Department of ECE, Kumaraguru College of Technology, Coimbatore, India. ranithottungal@yahoo.com

Abstract

The modernization of power system has paved way for inclusion of many technologies as well as integration of multiple energy sources. Though this highly makes the network efficient and reliable, delivery of quality power must be ensured. The advent of solid-state devices along with their technologies have become predominant in controlling the input parameters of the prime movers, in contrast to PI and Fuzzy based Controllers. In this connect, this paper presents a comparative survey of effects of adding various FACTS devices to a deregulated power system fed with multiple sources. The objective is to determine the preferable type of FACTS Controller in maintaining constant frequency and voltage with minimal amount of harmonic distortion.

Keywords — Automatic Generation Control, Deregulated, Flexible AC Transmission System, Thyristor Controlled Switching Capacitor, TCSC, Unified Power Flow Controller, UPFC.

ITP – 52

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Effect of Hybrid max filter and edge detection on scanning electron microscope picture of calcium oxide and copper oxide nanocomposites

Marudhachalam R[1], Renukadevi S[2], Ananthi S[3], Kannan R[4] and Tamilselvi R[5]

[1] Department of Mathematics, Kumaraguru College of Technology, Coimbatore.
[2] Department of Physics, Thiruvalluvar Government Arts College, Rasipuram.
[3] Department of Physics, Nandha College of Technology, Erode.
[4] Department of Science and Humanities – Physics Division, Kumaraguru College of Technology, Coimbatore.
[5] Department of Electronics and Communication Engineering, Sri Ranganathar Institute of Engineering and Technology, Coimbatore. Email: kannan.r.sci@kct.ac.in

Abstract

In this present research work,calcium oxide dopped with copper oxide nano structured composite have been preparedthrough co-precipitation method at constantmolar condition of 1:1 (CaO + CuO). The surface topography of the prepared sample was analyzed by using field emission scanning electron microscopy (FE - SEM) technique.The obtained SEM results of the prepared CaO + CuOsample reveals the existence of polycrystalline porous topography with a nano structured flower shape. The CaO and CuOcrystallites agglomerated with each other and it leads to form a flower shaped structure.The captured SEM images of CaO + CuO samples were investigated by pre-processing technique hybrid max filter and the grey level co-occurrence matrix is used to analyze the surface topographic information. This image processing approach is used to analyze the image enhancement and edge detected by Sobel and Canny filters. The agglomerated edge of the CaO + CuO sample was successfully analyzed using Sobel and Canny filters.

Keywords: CaO: CuO, co-precipitation, Sobel and Canny filters, FE - SEM and agglomeration.

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ITP – 53

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Proliferative Diabetic Retinopathy Diagnostic Investigation Using Retinal Blood Vessels Mining Technique

Parameswari P[1], Ponnibala M[2] (Corresponding Author), Priyanka E B[3], Thangavel S[4], Sivakumar N S[5]

[1]Department of MCA, Kumaraguru College of Technology, Coimbatore, India.
[2]Department of Electronics &Instrumentation Engineering, Kongu Engineering College, Perundurai.
[3]Department of Mechatronics Engineering, Kongu Engineering College, Perundurai.
[4]Department of Mechatronics Engineering, Kongu Engineering College, Perundurai.
[5]Department of Mechatronics Engineering, Tishk International University-TIU, Erbil, Iraq.
Email: ponnibala@kongu.ac.in, priyankabhaskaran1993@gmail.com

Abstract

In clinical field, wide assortments of utilizations can be managed utilizing Image handling. Recognition and screening of retinal sicknesses was one such application in picture preparing. Diabetic retinopathy is an inconvenience of diabetes. The ailment influences veins inside the retina. The retina is a region lying at the rear of the eyeball. In the most punctual phase of the infection, the little veins, or vessels, gotten slenderer, more fragile and inevitably they spill blood. A patient's sight at this stage is still acceptable yet an ophthalmologist can identify and see the irregularities in the retina. As the sickness advances, some veins are obstructed. These trigger the retina to develop fresh blood vessels, which are unusual, delicate, and effectively drain. In the later phase of the ailment, fresh blood vessels are developed ceaselessly just as scar tissue. Eventually, retina will be isolates from an eye.Another strategy for removing the retinal veins from the shading fundus retinal picture dependent on include grouping was proposed in this undertaking, to decrease the ophthalmologists' time and vitality for checking the retinal pictures. The veins are separated from the shading fundus picture by applying the preprocessing strategies and division procedures utilizing coordinated channel and adjusted nearby entropy thresholding activity. The preprocessed picture was then utilized for highlight extraction and these highlights were utilized for order reason. At long last, arrangement procedure was utilized for diagnosing the Proliferative Diabetic Retinopathy.

Keywords: Proliferative Diabetic Retinopathy, image processing, health informatics

ITP – 54

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The Automatic Saline Level Monitoring and Alert System using IoT

Maithili P[1] and Mercy Ramya A [2]

Assistant Professor [1], [2] UG Student, Dept. of EEE, Kumaraguru College of Technology, Coimbatore. Email: maithili.p.eee@kct.ac.in, mercy.17ee@kct.ac.in

Abstract

The patient health is improved from lack of fluids by supplying saline into their health. Whenever a saline is supplied to the patients, the patient requires to be constantly monitored by nurse or a care-taker. In hospitals there is always a need of a person to check the glucose dripping bottles whenever the patients get admitted. If there is no person in time to notice the glucose dripping bottle, there occurs the problem. This may lead to the reverse flow of blood from the veins of the patients, thus resulting in severe health problems. An automatic monitoring and alarm system is proposed in this paper for protecting the patient life expectancy from their saline supplying time periods. This new structure enables a advanced technique of regulating saline drop rate by means of supervising the saline scheme slightly by employing Internet of Things platform. This technique involves of a sensor utilized for supervising the crucial quantity of the saline fluid in the saline bottle and a system that force halt the saline liquid movement automatically when the saline bottle is totally empty. These techniques implemented in hospitals and also in houses.

Key words: Saline, Fluid level, Level Sensors, IoT.

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ITP – 55

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Deployment of Quantum Cryptographic Techniques in Securing the Patient Records in Smart Healthcare

Kowsalya T [1], Krithika S [2]

[1]UG Student, [2]Assistant Professor, Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore.   Email: kowsalya.17ec@kct.ac.in, krithika.s.ece@kct.ac.in

Abstract

We are in the world of automation. Persistent efforts are being made all around the globe in making the conventional systems 'smart' through automation and artificial intelligence thereby reducing man power. Therefore, urbanization involving emerging technologies like Big data, Internet of Things (IoT) and Cloud computing ensures efficient usage of resources resulting in a Smart lifestyle. It is estimated that smart living can save billions of economic and natural resources what we use today. This paper focuses on smart health care, handling various records and most importantly securing the medical data available online through effective cum advanced method of quantum key distribution (QKD). Medical data being extremely susceptible to data theft can lead to life threatening consequences if manipulated by hackers. In short, any smart aspect is baseless with lack of security for the data accessed through cloud. Henceforth, steps have been proposed in ensuring the security of the data for the existing as well as the privacy and security threats that could arise in near future.

Keywords - Automation, Artificial intelligence, Big data, Internet of Things (IoT), Cloud computing, Smart Health care, Quantum Key Distribution, Hackers, Security.

ITP – 56

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Generalized Regression Neural Network for Word Sense Disambiguation

Rajini.S [1] and Vasuki.A [2]
[1] Associate Professor, Department of Computer Science and Engineering
[2] Professor, Department of Mechatronics Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

In language processing, the identification of correct sense of word is a difficult one until to date. The reason behind this problem is the contribution of different meanings for a single word. A single word can give multiple meanings based on their expression and the neighbouring words. This necessitates research in the field of understanding the correct sense of context. The research process has been started from the golden era to modern days using different approaches like supervised learning, unsupervised and semi-supervised learning. This paper is about the supervised learning approach for the discrimination of sense of words. The approach is based on the training of a type of recurrent neural network called generalized regression neural network. The practical simulation of the proposed method is implemented using the Matrix Laboratory software and the meaning is identified using the WORDNET browser. The proposed method produced the good results with an accuracy of 98.5% on SEMEVAL TASK 11. Another advantage is that it takes less time for training the network due to the omission of reshape of feature values into a four dimensional form.

Keywords: Language processing, Sense of words, Tokenized document, DCNN, GRNN, Word Sense Disambiguation

ITP – 57

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Face Recognition and Sensor based Techniques for Contactless Attendance Tracking and Screening Technology: A Technical Review

Sasikala S[1], Arun Kumar S[2], Abeshek B B[3], Kavi Prakash C V[4], Keerthivasan T[5] and Rishi K[6]

[1]Associate Professors, [2]Assistant Professor, [3,4,5,6]UG Scholars, Kumaraguru College of Technology, Coimbatore. Email: sasikala.s.ece@kct.ac.in, arunkumar.s.ece@kct.ac.in, abeshek.18ec@kct.ac.in, kaviprakash.18ec@kct.ac.in, keerthivasan.18ec@kct.ac.in, rishi.18ec@kct.ac.in.

Abstract

Stepping out of home without mask is impossible in today's situation due to the global pandemic. This crisis has forced the world to shut down affecting its economy, day-to-day routine, and people's livelihood. Today, people are adapting to this new normal in a gradual manner. Therefore, making contactless attendance tracking and screening is an essential part in all the organizations. This will be solved by building a technology which will do multiple functions like detecting faces of people with their masks on and reading their body temperature involving various techniques computer vision and deep learning using Python, OpenCV, and TensorFlow/Keras and also some sensors like Infrared Temperature Sensor. The output values of these modules will be uploaded in cloud storage and can be viewed remotely. It is highly possible to reduce the spread of the virus and promote social distancing as per the government norms by using such technology driven solutions. The aim of this paper is to provide a technical review on such existing technologies and suggesting some solutions for additional features.

Keywords: Opencv, Convolution Neural Network, Eigen Faces, Local Binary Pattern, Principle Component Analysis, Single Short Detector, MLX90614, Arduino, Cloud computing, API.

ITP – 58

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Coin Based Mobile Charger

Saroja M N [1] ,Sathiya P K [2] , Ramalakshmi R [3]

[1]Assistant Professor, [2,3] UG Student, Department of Information Technology, Kumaraguru College of Technology, Coimbatore. Email: saroja.mn.it@kct.ac.in, sathiya.16it@kct.ac.in, ramalakshmi.16it@kct.ac.in

Abstract

The coin based mobile charger is the device that can act as a source of power when a coin is dropped in it. This system has a capability of accepting all types of coin. This system can be used in places such as bus stop , railway station and places where people would need charging facilities. Once the coin is inserted the mobile phone gets charging. The user can insert any kind of mobile phone since the system has multipin charger. Arduino helps in controlling the function of the system. The LCD display helps in showing the time left for charging. If an extra coin is dropped by the user then the coin gets validated and the value get added to the user charging timing. This device has a great demand where people need to charge their mobile phone.

Keywords - Multi-Coin Acceptor; Arduino; LCD Display;Relay.

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Attribute selection based subset generation on Lazy Learning Associative Classification

Siddique Ibrahim S P[1], Sivabalakrishnan M [2]

[1] Assistant Professor, Department of computing science and Engineering, Kumaraguru College of Technology, Coimbatore.
[2] School of Computing Science and Engineering,Vellore Institute of Technology, Chennai Campus, India

Email: siddiqueibrahim.sp.cse@kct.ac.in, sivabalakrishnan.m@vit.ac.in

Abstract

Lazy learning associative classification method gains higher accuracy than counterpart eager method. But it generates more number of the subset generation. The proposed method overcome this problem by focusing on the important feature of the given test instance. This focused feature from the test tuple play a critical role in finding the main objective. The proposed gain ratio based attribute selection algorithm select the significant fields to bring out most important small subset rules that may accurately predict class label. For example, this will help the physician to treat the patient with the actual condition of the disease from the predictive measures of classification. Experiment results showing that the feature selection based lazy method greatly improve the accuracy and minimize the execution time than eager associative classification. Experiment results show that the proposed algorithm attains better accuracy and reduce the computation time than traditional lazy learning associative classification.

Keywords: Lazy Associative Classification, Feature selection, Classification, Subset generation, Gain ratio

ITP – 60

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Alzheimer Disease Diagnosis Using Deep Learning: A Review

Baskaran K. R [1] and Sanjay V [2]

[1] Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

[2] Student Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

Alzheimer's disease (AD) is a severe, progressive neurological cerebrum disorder. Researchers for AD diagnosis have misused several statistical and AI models. AD's location is demanding because of the similarity in AD Magnetic Resonance Imaging (MRI) information and standard trustworthy MRI information of more seasoned individuals. As of late, progressed deep learning techniques have successfully demonstrated human-level execution in numerous fields, including medical image analysis. This review article presents the current deep learning approaches applied on AD diagonis. The results are compared and the research gap is found in literature to shed the light on future research that effectively provide the diagonis process.

Keywords: Alzheimer's disease, Deep Learning, MRI, Brain image processing

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ITP – 61

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A DC-DC Converter fed BLDC Motor Drive for Household Appliances

Arunkumar S[1], Mohana Sundaram N[2], Rani Thottungal[3]

[1, 2] Assistant Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore. Email: akumar5989@gmail.com, mohanasundaram.nms@gmail.com

[3]Professor, Department of ECE, Kumaraguru College of Technology, Coimbatore. Email: ranithottungal@yahoo.com

Abstract

Presently, Special Electrical Machines are finding a special place in manufacture of e-Vehicles and in the field of household appliances. This is because, conventional AC and DC Motors suffer with the problem of wear and tear problem, low efficiency and starting torque, sparking in brushes and requirement for frequent maintenance. These problems can be overcome by using Permanent Magnet Brushless DC Motor (PMBLDC Motor), whose rotor is made up of Permanent Magnets and stator winding being excited by three phase AC supply. As the commutation takes place using power electronic switches, ripples are introduced in electromagnetic torque waveform, with supply side power factor getting affected. So, to avoid this, this paper presents an approach of DC-DC Converter fed BLDC Motor drive and the proposed model is validated using MATLAB/Simulink platform.

Keywords - DC-DC Converter, Power Quality, BLDC Motor, e-Vehicle, Ripple, Home Appliances

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ITP – 62

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Discovery of Unknown Classes in Constrained Semi-Supervised Learning

Nithya Roopa S [1], Nagarajan N[2] and Sathya D [3]

[1] Assistant Professor, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore.

[2] Professor, Department of Computer Science and Engineering, Coimbatore Institute of Engineering and Technology, Coimbatore.

[3] Asst Professor II, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore.

Abstract

Supervised classification models have proved their significance in research and are utilized in many key areas.However, there are some limitations for these methods. In supervised learning, adequate labelled training data are required for each class. The learned classifier can classify only the data belonging to classes for which training data is available and lacks the ability to handle the data of unseen classes. However, in real time scenarios, there may not be adequate training data for all the classes. There could also be scenarios where the classes not available in the training data appearing in the testing data. The learner is expected to have the capability to uncover the class labels for the data belonging to unseen classes. To handle this situation, methods under different learning paradigms are proposed. In this work, various semi supervised learning techniques that can handle hidden classes(clusters) are evolved. Variant of Semi Supervised EM Based- K means and Naïve Bayes are discussed. The proposed technique is compared with the number of clusters identified by spectral clustering

Keywords: Semi-Supervised Learning, EM Based- K means, Naïve Bayes, Learning Paradigms, Spectral Clustering

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ITP – 63

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Towards Improving Skin Cancer Detection using Transfer learning

Sasikala S [1], Arun Kumar S [2] and Shivappriya S N [3]

[1,3] Assosciate Professor, [2] Assistant Professor, Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore.   E-mail: sasikala.s.ece@kct.a.in, arunkumar.s.ece@kct.ac.in

Abstract

In present time, skin cancer is the deadliest disease among humans. In US, two persons die every hour owing to skin cancer. Skin cancer is developed on the body when exposed to sunlight and is the abnormal growth of the skin cell. The patient's life can be saved through earlier and faster detection of skin cancer. The formal method of skin cancer detection is Biopsy, it is done by removing the skin cells and testing the samples in a clinical lab. Biopsy method is invasive and time-consuming. With the newer technologies, early detection of skin cancer at the initial stage is possible. Image processing techniques are instrumental in the health care industry to detect abnormalities in the human body. In this work, Convolutional Neural Network (CNN) algorithm with RESNET 34 transfer learning is used to classify the images of the skin with dermoscopic analysis which enables fast detection. A CNN model is trained using a dataset of 3700 clinical images and its performance is tested over 660 images which represent the identification of deadliest skin cancer. A considerable improvement in accuracy of skin cancer detection using deep learning provides a reliable approach for early detection and treatment.

Keywords: Skin cancer, Deep learning, detection, Convolutional Neural Network, transfer learning.

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ITP – 64

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Significance of Literacy in Minimizing Infant Mortality and Maternal Anaemia in India: A State-Wise Analysis

Shivappriya Sathyamangalam Natarajan[1], Maheshwari K[2], Saroja M N[3], RamalathaMarimuthu[4]

[1,2,3,4] Kumaraguru College of Technology Coimbatore. Email: shivapriyakvp@gmail.com, shivappriya.sn.ece@kct.ac.in

Abstract

The healthier babies shape the healthier Nation, the prime goal of the nation is to have a healthier mother and newborn. That is achieved with a good literacy level of the family. This work analyzes the importance of literacy for reducing still infant birth and Anaemia among the women in various states of India. The analysis is carried out with the linear regression model with two cases that are literacy rate below 75% and above 75% of the various states of India. The result clearly states that infant stillbirth is having a positive relationship with anaemia among the women in both the cases below and above 75%. But while seeing the literacy rate (below 75%) states are having positive slope with the stillbirth and negative slope with the literacy above 75% states. This shows that when there is a higher literacy rate (Atleast above 75%) there is reduced stillbirth or less infant mortality.

Keywords: State-wise Literacy Rate of India, Infant mortality rate, Maternal Anaemia, Linear regression

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ITP – 65

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Implementation of Narrow band IoT in potential healthcare Services

Umamaheswari S [1], Arthigaa K C [1], Yazhini K [1]

Electronics and Communication Engineering, Kumaraguru college of Technology, Coimbatore.   Email: umamaheswari.s.ece@kct.in,   arthigaa.18ec@kct.ac.in, yazhini.18ec@kct.ac.in

Abstract

Internet of things (IoT) is a highly developing technology which has its influence especially in healthcare sector. This development in IoT has led to the discovery of its own types. Narrow band IoT (NB-IoT) is one such type which provides economical IoT applications which is very useful in developing countries. The healthcare system has seen major change in terms of development due to internet of things. In recent days, the quality of living has been significantly deprived which evoked the need of internet of things to play a constructive role to provide better services. The use of narrow band has made it more affordable and simpler. Healthcare has its own need for IoT in surgeries, post operation monitoring and pre operation requisites. By providing IoT in healthcare the patients could be monitored properly and even remotely. We could also be able to do emergency procedures even outside the hospital where the major role is played by the sensors. In this paper we will be looking into how the narrowband IoT has its influence and applications in the healthcare services.

Keywords: NB IoT, healthcare, sensors, internet of things.

ITP – 66

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Breast Cancer Identification Using Logistic regression

Sathyavathi S [1], Kavitha S [2], Priyadharshini R [3], Harini A[4]

[1,2]Assistant Professor, [3,4,]Student, Department of Information Technology, Kumaraguru Collegeof Technology, Coimbatore. Email: kavitha.s.it@kct,ac,in, sathyavathi.s.it@kct.ac.in

Abstract

Breast cancer is due to uncontrolled breast cell formation. It happens in females and rarely in males. It is the second largest cause of death from cancer in women worldwide. The likelihood of a woman dying from breast cancer is around 1 in 38 (around 2.6%).   Since b2007, death rates from breast cancer have remained steady in women younger than 50, but h ave started to decline in older women. The death rate decreased by 1.3 percent per year betwe en 2013 and 2017.Cancer cells grow either in the lobules or in the breast ducts. Lobules are m ilk-producing glands, and ducts are channels thatcarry the milk to the nipple from the glands. In this article, we intend to suggest an approach to the diagnosis of breast cancer based on a c ollection of input variables describing some characteristics   of   cancer   cell. This method uses a model called Logistic Regression for machine learning. Experimental fin dings indicate that the regression model proposed is statistically important and has higher pre cision.

Keywords: Breast cancer, Lobules, Ducts, Machine learning, Logistic Regression.

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ITP – 67

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Rule Generation in Internet of Things to detect Anamoly and improve Network Performance

Jeba N[1] and Rathi S[2]

[1]Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore
[2]Department of Computer Science and Engineering, Government College of Technology, Coimbatore

Email: jeba.n.cse@kct.ac.in, rathi@gct.ac.in

Abstract

In this era of Internet of Things where most of the devices are connected, there is a rapid growth in the volume of data generated by sensors. Sensor Traffic analysis has got increasing research focus to protect the IoT infrastructure from intruders. Machine Learning Techniques can be used automatically to detect abnormal patterns in the data set. However, due to the high volume of data, real time reaction is to be done. In this paper, we are going to design an IoT Rule Generation Model based on Random Forest to identify exceptions and notify the system in real time to improve network performance.

Keywords: Internet of Things, Security, Rule Generation, Random Forest.

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ITP – 68

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Human and Vehicle Tracking Application during Pandemic Situation

Dr.K.Paramasivam[1] N.Arun[2] C.Dinesh[2] M.V.Harish[2] V.Roobhan rahul[3]

[1]Professor, Department of Electrical and Electronics Engineering [2]UG scholars, Department of Electronics and Communication Engineering, [3]UG scholar, Department of mechanical Engineering, Kumaraguru College of Technology, Coimbatore

Abstract

The covid-19 virus entry into this world has made a lot of negative as well as positive impacts in this world. One such impact on the positive side is the digital transformation which has been growing over the years and been growing at even a faster rate now. In order to control the mobility of people during pandemic situation, all the vehicle and passengers need to be tracked effectively to control the transmission of disease by using mobile application. The proposed vehicle Tracking Application is able to track the peoples and vehicles during pandemic period and check whether they follow the guidelines given by government authorities. App is developed with features like recording of vehicle and people details, fetching other details from government database, Global positioning system(GPS), Internet of Things(IoT), data analytics and providing information thru online. The featured app is allowed to use by road traffic police and other authorized front liners to control during pandemic situation. All will be used the app from different locations in the district, state and country. In a given point of location, when basic details of vehicle and people (registration number and ADHAAR) are entered, the app will give important details about the vehicle and people. The application will also be useful during normal days in check post spots for tracking the vehicles for any smuggling and other illegal activities. In this COVID pandemic situation these kinds of applications developed will make sure that the society and the country to the newer levels of security.

Keywords: IoT , Vechicle Tracking

ITP – 69

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Performance ananlysis of metamaterial inspired frequency reconfigurable folded slot antenna for wearable applications

Amsaveni A[1] and Bharathi M[1]

1Department of Electronics and Communication Engineering, Kumaraguru College of Technology, Coimbatore. Email: amsaveni.a.ece@kct.ac.in

Abstract

In this article, a frequency reconfigurable 2-wire folded slot antenna with meta-material based magnetic conductor is investigated for wearable applications. The antenna has a 2-wire folded slot and a stub which provides frequency reconfigurable capability by making a PIN diode opened and closed. The PIN diode modifies the radiation properties of stub. The stub and folded slot have diverse polarization and critical frequency. Hence, a meta-material based magnetic conductor surface is combined along with folded slot to decrease specific absorption rate and to enhance antenna efficiency. The whole antenna structure is modelled and simulated using Ansys High frequency structure simulation tool. The fabricated model along with the PIN diode and biasing network is being experimentally tested using vector network analyzer to verify the simulation results. The prototype antenna with meta-material has a return loss around -43.6 dB and 0.1 GHz bandwidth when PIN diode is opened. The article also explores radiation effects on human body. SAR is calculated at various positions from human head to antenna. The average SAR levels are reduced to 0.64 W/kg from 3.1W/kg for antenna with artificial magnetic surface. As the folded slot antenna yields small SAR values, it can be preferred for wearable applications.

Keywords: Reconfigurable antenna, folded slot, coplanar feed, meta-material, magnetic conductor, specific absorption rate.

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ITP – 70

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Blockchain Technology for Food supply chains

Sathya D[1], Nithyaroopa S [2], and Jeena Jacob I [3]

[1]Assistant Professor II, Dept. of CSE, Kumaraguru College of Technology, Coimbatore. Email: sathya.d.cse@kct.ac.in
[2]Assistant Professor, Dept. of CSE, Kumaraguru College of Technology, Coimbatore
[3]Associate Professor, GITAM School of Technology, GITAM University, Bengaluru

Abstract

Blockchain is an emerging technology widely used in almost all the applications like supply chain management systems, healthcare, banking industries, business, IT sectors, government organizations, agriculture etc. The food products are more sensitive, and it is very hard to trace the origin, buyers, sellers, farmers with the existing centralized approach. In this paper, we propose to use the blockchain technology with the features of decentralization, increased security, immutability, and tamper proof for supply chains. The proposed work uses the smart contract on Ethereum for food supply chain management systems, which avoids falsifying information, corrupting database, external attacks. The analysis of food supply chains is shown in the experimental results.

Keywords: Ethereum, Smart contracts, Supply chains, Blockchain technology

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ITP - 71

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Mobile Based Leaf Disease Classifier

Chandrakala D[1], R. Sarath Kishore[2], R. Kishore[3], M. K. Nandha Kumar[4]
[1] Professor, [2,3,4] Student Department of CSE Kumaraguru College of Technology Coimbatore
Email: chandrakala.d.cse@kct.ac.in, sarath.16cs@kct.ac.in, kishore.16cs@kct.ac.in,
nandhakumar.16cs@kct.ac.in

Abstract

Crop diseases pose a significant threat to food security and yield, but their rapid and efficient identification is still a rather complicated and cumbersome process in many parts of the world because of the lack of related infrastructure. The advent of A.I., current advances in the areas of image processing, and the increasing dispersion of mobile devices into the masses, advocates the idea of mobile-based disease identification. Using a public dataset of over 20000 images of healthy and infected tomato and potato leaves that were collected under certain controlled conditions, a deep convolutional neural network has been trained to analyse and identify 15 diseases of the said leaves. The trained model achieved an accuracy of 89.325% on a test set, illustrating the feasibility of this method. Overall, this method of training diverse deep learning data models on progressively large and diverse image datasets lays a clear foundation for mobile-based crop disease identification on a massive scale.

Keywords: Image processing, CNN, Feature Extraction

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Four Port DC-DC Converter Characteristics for Different Hybrid Energy Systems

Nakshatra Shankar [1] and Mohanraj M [2]

[1] PG Scholar, Department of EEE, Kumaraguru College of Technology, Coimbatore
[2] Associate Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore

Abstract

Renewable energy sources such as sun and wind are the alternative sources of green power generation which can facility the power demand problems. This paper presents the control approach for power flow management of a grid-connected hybrid photovoltaic (PV)–wind-battery-based system with a bidirectional dc-dc converter. The principle object of the proposed system is to meet the load demand, deal with the power flow from mixed sources, mainline the additional power into the grid, and charge the battery from the grid whenever essential. This can refine the reliability and efficiency of the system. The proposed Hybrid system with the FUZZY controlled Bidirectional DC-DC converters and Voltage regulated Inverter for stand-alone application is evolved and simulated in MATLAB.

Keywords: Solar Photovoltaic (PV), Wind Energy, Hybrid Energy System, Bidirectional DC-DC Converter, Maximum Power-Point Tracking, Mat lab Software.

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A Driver Drowsiness Detection System

R. Hari Haran, Dr. P.C. Thirumal and Dr. G.S Nandhakumar

[1] Student, M. Tech Data Science, Kumaraguru College of Technology, Tamil Nadu
[2, 3] Associate professor, M.Tech Information Technology, Kumaraguru College of Technology, Tamil Nadu

Abstract

The main causes of road accidents are the drowsiness and fatigue conditions of the driver. When the driver is in a state of drowsiness, his facial expression changes such as eyes blinking and yawning. To avoid such accidents, a detection system known as driver detection can be done to avoid such accidents and increase road safety. So, the drowsiness detection can be enchased by detecting the changes in the eyes and mouth regions, duration of eyes closure and also by capturing video images. In this paper, we propose a method for driver drowsiness detection using eye blinking rate i.e., Eye Aspect Ratio (EAR) and mouth yawning rate i.e., Mouth Aspect Ratio (MAR), and Pupil Circularity Rate (PUC). The facial components which are the main aspects for drowsiness detection are extracted and tracked using video sequence frames. The basic algorithm used to detect the techniques are Long Short-Term Algorithm (LSTM), Recurrent Neural Network (RNN) and Convolutional Neural Network (CNN). This system can be tested and implemented in a real-time environment.

Keywords: Driver Detection, Drowsiness, Long Short-Term Algorithm (LSTM), Recurrent Neural Network (RNN), Convolutional Neural Network (CNN)

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A Survey Paper on Driver Drowsiness Detection

R. Hari Haran[1], Dr. P.C. Thirumal[2], Dr. G.S. Nandha Kumar[3]
Student, M. Tech Data Science, Kumaraguru College of Technology, Tamil Nadu
Associate professor, M.Tech Information Technology, Kumaraguru College of Technology, Tamil Nadu
Associate professor, M.Tech Information Technology, Kumaraguru College of Technology, Tamil Nadu

Abstract

Our safety is a priority while traveling or driving. One mistake of the driver can lead to several injuries and significant losses. Nowadays, the driver's navigation system is improved by using the latest satellite technologies and sensors that are used for tracking. According to the National Survey of road safety and management, there is a huge raise in accidents every year. The main reason for these accidents is driver drowsiness while driving. So, to reduce accidents, the driver should be alerted before such incidents take place. There are various methods and efficient techniques that are developed to detect the driver's drowsiness and alert the driver when the driver feels sleepy. Therefore, we conduct various researches and analysis to abstract the best and most efficient method to alert the driver. Many techniques and designs are analysed on drowsiness detection to reduce accidents. We compare few method and techniques on driver drowsiness detection

Keywords:Driver Detection, Drowsiness, Long Short-Term Algorithm (LSTM), Recurrent Neural Network (RNN), Convolutional Neural Network (CNN)

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Classification of Leucocytes Using Deep Learning

Suganthi N [1], Preethi V [2], Swetha K [3] and Kannan K [4]

[1, 2, 3, 4] Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore. suganthi.n.it@kct.ac.in, preethi070598@gmail.com, swetha.15it@Kct.ac.in, kannan.15it@kct.ac.in

Abstract

The classification of white blood cells or leucocytes has become highly crucial for the diagnosis of anaemia, leukaemia and many other hematologic diseases. The density of WBCs in our blood stream provides a glimpse into the state of our immune system and any potential risks we might be facing. The main objective of this paper is to develop an automatic white blood cell classification system using deep learning. Most of the models proposed for this application so far has used transfer learning by fine tuning the 'State of the art" models like ResNet, Inception and VGGNet. But all these models were trained on ImageNet dataset which is completely different from the dataset used in this application. So in this study, we have proposed a deep learning model for the white blood cells classification task from the scratch, without using transfer learning.

Keywords:White blood cells, Leucocytes, Convolution Neural network, Convolution layer, pooling layer

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ITP – 76

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Representation of SARS with Tableau

Saparna.S[1],G.S. Nandha Kumar[2]

[1]Student M.Tech, Data Science, Kumaraguru College of Technology, Coimbatore
[2]Associate professor, Information Technology, Kumaraguru College of Technology, Tamil Nadu

Abstract

SARS corona virus is severe epidemic that an outbreak in 2003.It is an enveloped single-stranded positive-sense RNA virus which by binding to the angiotensin-converting enzyme 2 (ACE2) receptor enters its host cell. It's a member of Betacoronavirus and subgenus Sarsecoronavirus.This paper is about the world map representation of the SARS corona virus affected area. A set of data is taken from the kaggle and it has been worked using the software. It helps in the representation of the data in the understandable way. The representations involve multiple types of graphs, where each graph has each specification to do. The representation of SARS corona virus can be done using tableau 2020.1 software. The process of representing the data is nothing but Data Visualization. Here the graphs represent the density of the affected area.

Keywords: SARScorona virus, graphs, tableau 2020.1.

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Cloud Based Wrist Band for Body TemperatureMeasurement

S. Dharuneshwaran[1], S. Arunkumar[2], N. Mohana Sundaram[3]

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[1]Student, Department of EEE, Kumaraguru College of Technology, Coimbatore
[2,3]Assistant Professor, Department of EEE, Kumaraguru College of Technology, Coimbatore
e-mail: akumar5989@gmail.com
e-mail: mohanasundaram.nms@gmail.com

Abstract

SARS corona virus is severe epidemic that an outbreak in 2003.It is an enveloped single-stranded positive-sense RNA virus which by binding to the angiotensin-converting enzyme 2 (ACE2) receptor enters its host cell. It's a member of Betacoronavirus and subgenus Sarsecoronavirus.This paper is about the world map representation of the SARS corona virus affected area. A set of data is taken from the kaggle and it has been worked using the software. It helps in the representation of the data in the understandable way. The representations involve multiple types of graphs, where each graph has each specification to do. The representation of SARS corona virus can be done using tableau 2020.1 software. The process of representing the data is nothing but Data Visualization. Here the graphs represent the density of the affected area.

Keywords: SARScorona virus, graphs, tableau 2020.1.

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Analysis of Microarray Gene Expression Data Using Various Feature Selection and Classification Techniques

[1]W. Jai Singh and [2]R. K. Kavitha

[1,2,]Assistant Professor (SRG), Department of Computer Applications ,Kumaraguru College of Technology, Coimbatore.
jaisingh.w.mca@kct.ac.in

Abstract

The prediction and diagnosis of the cancer disease can be augmented by applying classification techniques on the microarray-based gene profiling data. It is observed that a massive data will be generated due to the regular changes that happen in the cancer producing genes among humans. Along with the vast expression of genes, only a minor fraction of it are substantially articulated. By performing analysis of microarray data, the cancer-causing genes can be identified with higher accuracy. Normally, feature selection will be performed on the data followed by the classification process. The objective of this manuscript is to select the meaningful gene features of DNA microarray data with the help of ANOVA technique thus displaying an enhanced performance of algorithms like Ada Boost, Neural Networks and Random Forest. To evaluate the suggested method, it is planned to lessen the gene count from breast and leukemia obtained from DNA microarray dataset. Investigational results on the above-mentioned datasets reveals that the gene picked by the suggested methodology displays an improved classification accuracy of Neural Networks. This work tries to draw a comparison between Neural Networks and ANOVA techniques along with classical feature selection method and more classifiers. It can be concluded that ANOVA feature selection method along with neural networks offers improved accuracy of classification. Also, the ROC reveals the excellent subclass of genes with a better classification accuracy.

Keywords: Microarray data, Gene Expression, ANOVA, Information Gain, Fast Correlation Based Filter, Neural Networks

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