







ABSTRACT BOOK

3rd **IEEE** CONFERENCE ON INFORMATION & COMMUNICATION TECHNOLOGY

6-8 DECEMBER, 2019

ORGANIZED BY IIIT ALLAHABAD

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R Signal Processing Society-UP SEGTION CHAPTER





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Conference Committee

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Program Schedule

Time Date	08.30AM- 10.00AM	10:00AM- 10:45AM	10.45AM- 11:30AM	11:30AM- 11:45AM	11.45AM- 12:30PM	12:30 PM-1:30 PM	01:30PM- 3.00PM	03.00 PM-03:45 PM	03:45 PM- 4:30 PM	04.30PM-04.45PM	04.45PM- 05.30PM 05:30 6:15P	0PM- PM 7:00PM - 8:00M	8:00PM - 10:00M
	ATION	TS1-Tutoria T. (5	al by Prof. Aditya rivedi 5006)	High Tea			lunch			èa	TS-2- (55,66,68,79,89 ,62,106) (5055)	39,122	
6-Dec-1	REGISTR		Skype Presentati (5054) (14,152,47,154	on 4)	(53)	imituee Meeting 322)	Working	Inaugral Session (5055)		High 1	TS-3- (21,26,31, 113,150,171, (5054) TS-4- (42,58,80,88,91 120,148,157, (5007)	1,51,56, 1,36) 1,107, 7,72)	
7-Dec-1	REGISTRATION	Keynote-1 Prof. P. Nagabhushan (5055)	Keynote-2 Prof. Sandeep Shukla (5055)	High Tea	TS (123,125,135,151 74 (50 (35,38,73,75,82, (35,38,73,75,82, (50)	8-5- ,158,162,166,140, ,46) 055) 8-6- 108,141,167,109, 81) 006)	Working Lunch	Keynote-3 Prof. Sokratis Katsikas (5055)	Keynote 4 Prof. Gaurav Sharma (5055)	High Tea	TS-7- (65,67,95 147,163) (5006) TS-8- (69,76,92,110,11 84) (5007)	5,102,) Cultural Evening (Main Auditorium)	Social Networking & Banquet Dinner
8-Dec-1	REGISTRATION	Keynote-5 Prof. Shekhar Verma (5055)	TS-9 - (39,53,99,101) (5054) TS-10- (87,98,138,142, 159,178) (5007) TS-	ष्ट्र मुझ् म 11-PhD Symposiu (5	TS. (48,126,133,16) 77, (50) TS: Miscellane (50) m Presentation (20) 055)	-12- 1,165,49,85,104, 179) 006) -13- cous Papers 007) 1-208)	Working Lunch	Pannel Discussion	Valedictory Function & Award & Certificates Distribution (5055)	High Tea		Departure	

Note:

Each author will be allotted 10-15 mins(including questionnaire) for the oral presentation.
All the participants are requested to be punctual for the registration timing in the morning.
High tea will be porvided besides the presentation room on ground floor, CC-3Building.
All the participants are invited for the Banquet Dinner scheduled on 7th December2019.

Technical Session Schedule

TS-2 (SI	S-2 (SIVP) Date - December 06, 2019 Time - 04:45 PM - 6:15 PM Venue: 5055							
Session	Session Chair - Dr. Pritee Khanna (IIITDM Jabalpur), Dr. Basant Kumar Singh (MNNIT)							
Paper				Authors				
ID	Presenter	Organization	Title					
		PDPM Indian Institute of Information	Glaucoma Detection using Fuzzy C-	Rakshita Karmawat, Neha Gour and Pritee Khanna				
	D 1 1 1 1 17	and Technology, Design and	means Optic Cup Segmentation and					
55	Rakshita Karmawat	Manufacturing, Jabalpur	Feature Classification					
66	Avush Mandloi	ABV-Indian Institute of Information	An Automatic Cell Nuclei	Ayush Mandloi, Ushnesha Daripa, Mukta Sharma and				
00	riy asir manalor	Technology and Management	Strategies	Manua Dhattacharya				
			A Machine Learning Algorithm for No	Kiruthika S, Masilamani V.				
			Reference Image Quality Assessment					
69	Vimithilio C	UITOM Kanahaanunam	using Non-Subsampled Contourlet					
00	Kii uunika S	ппом канспееритані		Pullo Deisch, Mohammad, Javed, Datasch and				
			DCI-CompCNN: A Novel Image	Shubham Srivastava				
79	Bulla Rajesh	Indian Institute of Information	JPEG Compressed DCT	ondonam onvastava				
	2	Technology, Allahabad	Coefficients					
			Abnormality classification in the	Sudharson S. and Priyanka Kokil				
	0 11 0	Indian Institute of Information	kidney ultrasound images using					
89	Sudharson S.	Technology Design and Manufacturing	singular value decomposition					
			Weapon Classification using Deep	Neelam Dwivedi, Dushvant Kumar Singh and				
122	Neelam Dwivedi	MNNIT Allahabad, Prayagraj	Convolutional Neural Network	Dharmender Singh Kushwaha				
			GLCM Based Feature Extraction and	Pawan Kumar Mall, P K Singh and Divakar Yadav				
		Madan Mohan Malaviya University of	Medical X-RAY Image Classification					
62	Pawan Kumar Mall	Technology, Gorakhpur	using Machine Learning Techniques					
			Model Independent Method For	Sunil Datt Sharma, Sanjeev Narayan Sharma and Rajiv				
100	Sumil Datt Charme	Jaypee University of	Acceptor Splice Site Prediction In	Saxena				
106	Sumi Datt Sharma	Welroepet H P	DNA Sequences					
		wakiiagiiai, ii.r.						

TS-3 (W	CIT) Date - December (06, 2019 Time - 04:45 PM - 6:15 PM	Venue: 5054	
Session	Chair - Dr. Neetesh Puroh	it (IIIT Allahabad), Dr. Matadeen Bansal(IIITDM	I Gwalior)	
Paper ID	Presenter	Organization	Title	Authors
21	Anmol Tigga	NIT Puducherry	Towards a Vehicle's behavior monitoring and Trust Computation for VANETs	Anmol Tigga and Arun Raj Kumar Parthiban
26	Shikha Maurya	PDPM-IIITDM JABALPUR	On Robust Precoder Design for Energy- Efficient MIMO-Cognitive Relay Networks	Shikha Maurya and Matadeen Bansal
31	Palash Kundu	Jadavpur University	Improving Spectral Efficiency for Device-to- Device Data Offloading in Underlay Cellular Networks	Palash Kundu, Mohit Mahata, Manoj Rana and Bhaskar Sardar
51	Varun Shukla	PSIT	An Authenticated and Secure Electronic Health Record System	Varun Shukla, Anchal Yadav and Arpit Mishra
56	Rahul Prakash	Bipin tripathi Kumaon Institute of Technology, Dwarahat Almora, Uttarakhand	Optimized Hybrid Clustered Protocol for IoT Heterogeneous Wireless Sensor Networks	Rahul Prakash, Parul Kansal,Varun Kumar Kakar
113	Anubhav Shivhare	Indian Institute of Information Technology, Allahabad	Spatial Correlation Based Device Level Clustering for IoT	Anubhav Shivhare, Manish Kumar Maurya, Vatsal Saglani, Manish Kumar
150	Arti Gupta	Indian Institute of Information Technology, Allahabad	Reinforcement learning based energy management in wireless body area network: A Review	Arti Gupta, Manish Kumar Maurya and Vijay Kumar Chaurasiya
171	Gagandeep Kaur	ABV-Indian Institute of Information Technology and Management, Gwalior	Energy Conservation Schemes for Wireless Sensor Networks:Survey	Gagandeep Kaur, Mahua Bhattacharya and Prasenjit Chanak
36	Nidhi Singh	Madan Mohan Malaviya University of Technology, Gorakhpur	Efficient Method for Data Synchronization in Mobile Database	Nidhi Singh and Muzammil Hasan

TS-4 (CI	S-4 (Cl&ML) Date - December 06, 2019 Time - 04:45PM-6:15PM Venue: 5007						
Session	Session Chair - Dr. K. P. Singh, Prof. Suneeta agarwal (MNNIT)						
Paper				Authors			
ID	Presenter	Organization	Title				
			AN INTRODUCTION AND REVIEW ON	Preeti Singh, S. P. Singh and D. S. Singh			
			MACHINE LEARNING APPLICATIONS				
42	Preeti Singh	MMMTU, Gorakhpur, India	IN MEDICINE AND HEALTH CARE				
		Mukesh Patel School of Technology	DEFECT CLASSIFICATION FOR SILK	Shweta Loonkar and Dhirendra S			
		Management & Engineering, NMIMS	FABRIC BASED ON FOUR DFT				
58	Shweta Loonkar	University, Mumbai	SECTOR FEATURES				
				Swarup Padhy, Juhi Tiwari, Shivam Rathore and			
		Atal Bihari Vajpayee Indian Institute	Emergency Signal Classification for	Neetesh Kumar			
		of Information Technology and	the Hearing Impaired using Multi-				
80	Swarup Padhy	Management (ABVIIITM) Gwalior	channel Convolutional Neural Network				
			Architecture				
			Malaria Parasite Recognition in Thin	Dr Somesh Kumar, Shivendra Pratap Singh, Prakhar			
		ABV-Indian Institute of Information	Blood Smear Images using Squeeze	Bansal and Pankaj Srivastava			
88	Dr Somesh Kumar	Technology & Management Gwalior	and Excitation Networks				
			Development Of An Improved	Manpreet Kaur			
			Tomato Leaf Disease Detection And				
91	Manpreet Kaur	Punjabi University	Classification Method				

107	Nairit Banerjee	Indian Institute Of Information Technology, Allahabad	Mitosis Detection Using Image Segmentation and Object Detection	Nairit Banerjee, Anmol Singh Sethi, Manavdeep Singh, Srisha Anagh G, Upendra Badnena Svvr, Artus Krohn- Grimberghe and Ranjana Vyas
120	Anshul Sharma	Indian Institute of technology (BHU)	Early classification of time series based on uncertainty measure	Anshul Sharma and Sanjay Kumar Singh
148	Ashutosh Chandra	Indian Institute of Information Technology, Allahabad	Regularised Encoder-Decoder Architecture for Anomaly Detection in ECG Time Signals	Ashutosh Chandra and Rahul Kala
157	Upendra Pratap Singh	Allahabad	Zero Shot Learning using Active Learning	Upendra Pratap Singh, Kaustubh Rakesh, Rishabh, Vipul
72	Shalini Perera	Sri Lanka Institute of Information Technology	Supply and Demand Planning Of Electricity	Shalini Perera, Sathya Dissanayake, Sehan Desilva, Dinithi Fernando and Windhya Rankothge
47	Kaustubh Chakradeo	Smt. Kashibai Navale College of engineering	Breast Cancer Recurrence Prediction Using Machine Learning	Kaustubh Chakradeo, Sanyog Vyawahare, Pranav Pawar

TS-5 (SIV	VP) Date - December 0	7, 2019 Time - 11:45 AM - 1:30 PM 💦	/enue: 5055	
Session	Chair - Prof. S.K. Singh(IIT	BHU), Dr. Shivram Dubey (IIIT Sri)		
Paper ID	Presenter	Organization	Title	Authors
123	Sameeksh a Shrivastav a	Jaypee University of Engineering and Technology, Guna, M.P.	Partitioned Based Image Segmentation	Sameeksha Shrivastava and Ajay Kumar
125	Mohd. Aquib Ansari	MNNIT ALLAHABAD, PRAYAGRAJ	An Approach for Human Machine Interaction using Dynamic Hand Gesture Recognition	Mohd. Aquib Ansari, Dushyant Kumar Singh
135	Yash Srivastava	Indian Institute of Information Technology, Sri City, Chittoor, Andhra Pradesh, India	PSNet: Parametric Sigmoid Norm Based CNN for Face Recognition	Yash Srivastava, Vaishnav Murli and Shiv Ram Dubey
151	Madhuchhanda Dasgupta	Indian Institute of Information Technology Kalyani	Automated Helmet Detection for Multiple Motorcycle Riders using CNN	Madhuchhanda Dasgupta, Oishila Bandyopadhyay and Sanjay Chatterji
158	Kalpana Singh	Motilal Nehru National Institute of Technology, ALLAHABAD	An Enhanced Criterion for Induced H inf. Stability of Discrete-time Systems with Time-varying Delay and External Disturbance	Kalpana Singh, Dinesh Chaurasia and V. Krishna Rao Kandanvli
162	Mahesh K Singh	National Inatitute of Technology Delhi	Fusion of Heterogeneous Range Sensors Dataset for High Fidelity Surface Generation	Mahesh K Singh
166	Arthi R.	IIITDM Kancheepuram	An Observer based FLL to Estimate the Grid Parameters of Three Phase Systems	Arthi R., Arun K and Selvajyothi K
140	K V Sai Vineeth	Indian Institute of Information Technology, Sri City, Chittoor, Andhra Pradesh, India	LEDCOM: A Novel and Efficient LED Based Communication for Precision Agriculture	K V Sai Vineeth, Raja Vara Prasad and Shiv Ram Dubey
74	Manju Prasad M	Mangalore University, Karnataka.	Stacked Filter Bank based descriptor for Human Action Recognition from Depth Sequences	Shekar B H and Rathnakara Shetty P, Leonid Mestetsky Manju Prasad M
46	Ojas Ramwala	NIT,Surat	Optimizing Driver Assistance Systems for Real-Time performance on Resource Constrained GPUs	Ojas Ramwala, Dr. Chirag N. Paunwala and Mita Paunwala

TS-6 (NI	S) Date - December 07	7, 2019 Time - 11:45 AM-1:30 PM V	enue: 5006	
Session	Chair - Dr. Venkatesan (II	IT Allahabad) and Dr. Neeraj Tyagi (MNNIT)		
Paper ID	Presenter	Organization	Title	Authors
35	Srikar Paida	Pandit Dwarka Prasad Mishra, Indian Institute of Information Technology, Design and Manufacturing, Jabalpur	Certificate-less Public Key Encryption For Secure e-Healthcare Systems	Srikar Paida, Mayank K. Aditia, Fahiem Altaf and Soumyadev Maity
38	Nitish Andola	Indian Institute of Information Technology, Allahabad	SHEMB:A secure approach for healthcare management system using blockchain	Nitish Andola, Raghav Gahlot, Sourabh Prakash, Venkatesan Subramanian and Shekhar Verma
73	Shailendra Tomar	Raja Ramanna Center for Advanced Technology	Investigations on Equal Cost Multi Path Feature in Dynamic Routing Protocols in IPv6 Networks	Shailendra Tomar, Anil Rawat, Prakash D Vyavahare and Sanjiv Tokekar
75	Raghav Gahlot	Indian Institute of Information Technology, Allahabad	Tamper-Proof Certificate Management System	Raghav Gahlot, Nitish Andola, S. Venkatesan and Shekhar Verma
82	Pratyush Ranjan	Atal Bihari Vajpayee-Indian Institute of Information Technology and Management, Gwalior	Decentralised and Distributed System for Organ/Tissue Donation and Transplantation	Pratyush Ranjan, Shubhanker Srivastava, Vidit Gupta, Shashikala Tapaswi and Neetesh Kumar
108	Ankur Shukla	Norwegian University of Science and Technology, Gjøvik	Vulnerability Discovery Modelling With Vulnerability Severity	Ankur Shukla, Basel Katt and Livinus Obiora Nweke
141	Anand Joshi	University of Lucknow	A new method of multi color image encryption	Anand Joshi and Dhanesh Kumar
152	Murugesan G	St. Joseph's College of Engineering	Divisible Load Scheduling from Single Source in Distributed Heterogeneous Environments	Murugesan G and Sherin K

167	Akhilesh Panchal	IIIT-Allahabad	REHR: Residual Energy based Hybrid Routing Protocol for Wireless Sensor Networks	Akhilesh Panchal and Rajat Singh
109	Pradeep Singh	National Institute of Technology, raipur	Stacking Based approach for prediction of faulty modules	Pradeep Singh
181	Arvind Singh	SAG, DRDO, DELHI	Power Attack on VHDL Implementation of Continuously Running Block Ciphers	Arvind Singh and Sp Mishra

TS-7 (C1	TS-7 (CTS) Date - December 07, 2019 Time - 04:45 PM-6:15 PM Venue: 5006						
Session	Session Chair - Dr. Suneel Yadav (IIIT Allahabad), Dr. Y. N. Singh(IITK), Dr. Arun Prakash (MNNIT)						
Paper ID	Presenter	Organization	Title	Authors			
14	Anoop Kumar Mishra	ABV-IIITM, Gwalior	Performance analysis of MIMO-NOMA- Based Indoor Visible Light Communication in Single Reflection Environment	Anoop Kumar Mishra and Aditya Trivedi			
65	Abhishek Kumar	Indian Institute of Information Technology Allahabad	FIR Filter Realization Under the Trade- Off Between Implementation Complexity and Computation Rate	Abhishek Kumar and Suneel Yadav			
67	Anshul Pandey	Indian Institute of Information Technology Allahabad	Physical Layer Security in Intervehicular Cognitive Relaying Communication Systems	Anshul Pandey and Suneel Yadav			
95	Amiya Kumar Mondal	Indian Institute of Information Technology Design & Manufacturing Kancheepuram	Thinning of Concentric Circular Antenna Array Using Binary Salp Swarm Algorithm	Amiya Kumar Mondal and Prerna Saxena			
102	Neha Jaiswal	Indian Institute of Information Technology Allahabad	Performance Evaluation of Non- orthogonal Multiple Access in V2V communications Over Double-Rayleigh Fading Channels	Neha Jaiswal and Neetesh Purohit			
147	Abhishek Patel	PDPM IIITDM Jabalpur, Madhya Pradesh	UWB Monopole Antenna with Triple- Band Notch Rejection	Abhishek Patel and Manoj Singh Parihar			
163	Soumit Chaudhury	Indian Institute of Information Technology Allahabad	Tuning of Passbands in Compact Substrate Integrated Waveguide Bandpass Filter using perturbation slot	Soumit Chaudhury, Seema Awasthi and Rajat Singh			

TS-8 (CF	CI+RAI) Date - Decemi	ber 07, 2019 Time - 04:45 PM-6:15PM	Venue: 5007	
Session	Chair - Prof. P.K. Singh (N	IMMUT), Dr. Pankaj Pandey (NTNU Norway), P	rof. G. C. Nandi (IIITA)	
Paper				Authors
ID	Presenter	Organization	Title	
69	Anand Handa	C3I Center, Indian Institute of Technology, Kanpur, India	Cyber Risk Assessment of Networked Cyber Assets using Probabilistic Model Checking	Anand Handa, Subhasis Mukhopadhyay, Shankhadip Mallick, Nitesh Kumar, Sandeep K. Shukla, Remish L. Minz, Sanjana Pai Nagarmat and Ramesh Rakesh
76	Vinay Mahore	Indian Institute of Information Technology, Allahabad	Secure and Privacy Focused Electronic Health Record Management System using Permissioned Blockchain	Vinay Mahore, Priyanshi Aggarwal, Nitish Andola, Raghav Gahlot and S. Venkatesan
92	Gaganjeet Reen	IIIT Allahabad	Decentralized Patient Centric e-Health Record Management System using Blockchain	Gaganjeet Reen, Manasi Mohandas and Venkatesan S
110	Himank Goel	IIIT Allahabad	Three Phase Authentication Protocol for Smart Grid Communication	Himank Goel, Ayush Gupta, Harshit Jain, Aashutosh Khandelwal, Harsh Jain, Ayush Sinha and Om Prakash Vyas
111	Aida Akbarzadeh	Norwegian University of Science and Technology	Cyber-Physical Interdependencies in Power Plant Systems: A Review of Cyber Security Risks	Aida Akbarzadeh, Pankaj Pandey and Sokratis Katsikas
112	Sabarathinam Chockalingam	Institute for Energy Technology	Developing a Bayesian Network Framework for Root Cause Analysis of Observable Problems in Cyber- Physical Systems	Sabarathinam Chockalingam and Vikash Katta
84	Gaurav Bhardwaj	IIT ROORKEE	An Unsupervised Neural Network Approach for Inverse Kinematics Solution of Manipulator following Kalman Filter based Trajectory	Gaurav Bhardwaj, N. Sukavanam, Ruchi Panwar and R. Balasubramanian

TS-9 (CBD+CS) Date - December 08, 2019 Time - 10:45 AM - 11:30 AM Venue: 5054					
Session Chair - Prof. Anil Kumar Singh (MNNIT Allahabad) and Dr. Manish Kumar (IIIT Allahabad)					
Paper				Authors	
ID	Presenter	Organization	Title		
		MADAN MOHAN MALVIYA	Flash Translation Layer and its	Shweta and Pradeep Kumar Singh	
3	9 Shweta	UNIVERSITY OF TECHNOLOGY	functionalities		
			Towards comparison of real time	Devesh Kumar Lal and Ugrasen Suman	
5	3 Devesh Kumar Lal	scsit davv	stream processing engines		
			Noise Analysis of Quantum	Lakshya Priyadarshi and Utkarsh Azad	
		Institute of Engineering and	Approximate Optimization Algorithm		
9	9 Lakshya Priyadarshi	Technology, Lucknow	on Weighted MAX- CUT		
			Virtual workplaces testing	Nikolay Voit, Semen Bochkov and Sergey Kirillov	
15	4 Nikolay Voit	Ulyanovsk state technical university	method on accordance with the		
			technical task		
			Classification of arrhythmia using	Mohit Dhaka and Porus Khetarpal	
		BHARATI VIDHYAPEETHS	time- domain features and support		
10	l Mohit Dhaka	COLLEGE OF ENGINEERING, NEW	vector machine		
		DELHI			

TS-10 (MSD) Date - December 08, 2019 Time - 10:45 AM-11:30 AM Venue: 5007					
Session Chair - Dr. Manish Goswami (IIITA)					
Paper				Authors	
ID	Presenter	Organization	Title		
87	Samiksha Singh	REWA ENGINEERING COLLEGE, REWA (M. P.)	ULTRA LOW POWER HIGH GAIN HIGH SPEED OTA	Samiksha Singh, Aman Singh, Akash Bahetra and Layak Yadav	
98	Tangudu Bharat Kumar	Malaviya National Institute of Technology Jaipur	Design Automation of 5-T OTA using gm/ID methodology	Tangudu Bharat Kumar, Gaurav Kumar Sharma, Arun Kishor Johar, Deepak Gupta, Sougata Kumar Kar and Dharmendar Boolchandani	
138	Okikioluwa E. Oyedeji	Howard College, University of KwaZulu-	Mixed Signal Device Perspective	Okikioluwa E. Oyedeji and Viranjay M. Srivastava	
142	Deepak Gupta	MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR	A Comparison of Multi Chopper Amplifiers for Capacitive MEMS Transducer	Deepak Gupta, Gaurav Sharma and Dharmendar Boolchandani	
159	Vikrant Varshney	Motilal Nehru national Institute of technology Allahabad	Electronically Tunable First Order Universal Filter based on CCDDCCTA	Priyanka Singh, Vikrant Varshney, Ankur Kumar and Rajendra Kumar Nagaria	
178	Pratosh K. Pal	M M M U T Gorakhpur	Impact of Channel Doping Fluctuation and Metal Gate Work Function Variation in FD- SOI MOSFET for 5nm BOX Thickness	Vikrant Varshney Ankur Kumar Rajendra K. Nagaria, Avaneesh Kumar Dubey	

TS-11 PhD Symposium Date - December 08, 2019 Time - 10.45 AM-1:30PM Venue: 5055				
Session Chair - Dr. Neetesh Purohit (IIITA), Prof. Uma Shanker Tiwary (IIITA), Prof. Aditya Trivedi(IIIT G), Prof. Y. N. Singh(IITK), Prof. Dr. Prakash D. Vyavahare(SGSITS)				
Paper ID	Presenter	Title		
201	Dr. Dheeraj Malhotra	An Intelligent Approach To Design A Personalized Search System Using Next Generation Big Data Analytics		
202	A.Anath	Error Analysis Of Space Shift Keying Systems		
203	ANIRUDDHA DEY	Studies On Feature Extraction And Fusion Techniques For Face Recognition		
204	Satish K. Tiwari	Estimation And Optimization Of Design Parameters In Diffusive Molecular Nano networks		
205	Priyanka Mishra	Study And Performance Evaluation Of Quasi And Rotated Quasi Orthogonal Space Time Block Coded MIMO Systems With Advance Detector Scheme Under Various Modulation Techniques		
206	Nikhil Agarwal	Design Of Nearly Linear Phase Infinite Impulse Response Filters Using Evolutionary Techniques		
207	Sudhanshu Gonge	Performance Enhancement Of Digital Watermarking Techniques For Security Of Still Image		
208	Chengathir Selvi	Video Based Face Recognition For Biometric Authentication		

13-12 (IS&RU+NLF) Date - December 06, 2019 TIME - 11.45 AVI-1130 PM Vedue: 5006					
Session	Chair - Dr. T. Pant (IIITA),	Prof. S.P. Singh(WiWiViOT)			
Paper	n (0		Authors	
ID	Presenter	Organization	Title		
48	Ashish Srivastava	MIT Academy of Engineering	Undani – A System for Enhanced Farming	Ashish Srivastava, Rahul Mahajan, Dnyandeep Sagar and Pratik Shende	
126	Thirundi Perera	SLIIT	Film Shooting Scheduler	Thirundi Perera, Malith Senarath, Ravindu Viduranga, Chathuranga Wijayananda and Windhya Rankothge	
133	Bhanu Pratap Singh Ba	Indian Institute of Information Technology Kalyani	Analysis of Multitasking in Divided Attention using Machine Learning	Bhanu Pratap Singh Bankoti, Chandra Shekhar Gupta, Oishila Bandyopadhyay and Mallika Banerjee	
161	Ashish Singh Patel	International Institute of Information Technology – Naya Raipur	RealTime Tracking and Vehicle Monitoring in Surveillance Video	Ashish Singh Patel, O. P. Vyas and Muneendra Ojha	
165	Ankita Srivastava	Motilal Nehru National Institute of Technology Allahabad	Quality-of-Service based Reliable Route Discovery using Ant Colony Optimization for VANET	Ankita Srivastava, Arun Prakash and Rajeev Tripathi	
49	Sahinur Laskar	National Institute of Technology Silchar	Neural Machine Translation: English to Hindi	Sahinur Laskar, Abinash Dutta, Partha Pakray and Sivaji Bandyopadhyay	
85	Mayank Shrivastava	Jaypee University of Engineering and technology, Guna, M.P.	Investigating the Challenges and Methodologies of Sentiment Analysis: A Review	Mayank Shrivastava and Shishir Kumar	
104	Mudasir Ahmad Wani	Norwegian University of Science and Technology	A Language-independent gender classifier for Online Social Networks	Mudasir Ahmad Wani, Nancy Agarwal, Patrick Bours, Suraiya Jabin and Syed Zeeshan Hussain	
77	Tushar Goswamy	IIT Kanpur	Defocus based Novel Keyboard Design	Priyanshu Gupta, Tushar Goswamy, Himanshu Kumar and K.S. Venkatesh	
179	S Denis Ashok	Vellore Institute of Technology, Vellore	A color similarity based thresholding approach for buried land mine detection in thermal images	S Denis Ashok Bhanshidhar Majhi K Senthil Kumaran	

Technical Sessions Information

	Session	Session Chair/Co-chair		Date
			ue	
-	Skype Session	Dr. Vrijendra Singh, IIIT Allahabad	5054	6-12-2019
		Dr. M. Srikumar, IIIT Kancheepuram		
TS1	5G technology	Prof. Aditya Trivedi, IIITM Gwalior	5006	6-12-2019
(Tutorial)				
TS2	Signal Image and Video	Dr. Basant Kumar Singh, MNNIT Allahabad,	5055	6-12-2019
(SIVP)	Processing	Dr. Pritee Khanna, IIITDM Jabalpur		
TS3	Wireless Communications	Dr. Neetesh Purohit, IIIT Allahabad	5054	6-12-2019
(WCIT)	and Internet of Things	Dr Matadeen Bansal, IIITDM Jabalpur		
TS4 (CI &	Computational Intelligence	Dr. K.P. Singh, IIIT Allahabad	5007	6-12-2019
ML)	and Machine Learning	Prof. Suneeta Agarwal, MNNIT Allahabad		
TS5	Signal Image and Video	Prof. S.K. Singh, IIT BHU	5055	7-12-2019
(SIVP)	Processing	Dr. Shivram Dubey, IIIT Sri City		
TS6 (NIS)	Networks and Information	Dr. Venkatesan, IIIT Allahabad	5006	7-12-2019
	Security	Dr. Neeraj Tyagi, MNNIT Allahabad		
TS7 (CTS)	Communication	Dr. Suneel Yadav, IIIT Allahabad	5006	7-12-2019
	Technology and Systems	Dr. Arun Prakash, MNNIT Allahabad		
TS8 (CPCI	Cyber Physical Security in	Prof. P. K. Singh, MMMUT	5007	7-12-2019
+ RAI)	Critical Infrastructure +	Dr. Pankaj Pandey, NTNU, Norway		
	Robotics and Artificial	Dr. G. C. Nandi, IIIT Allahabad		
	Intelligence			
TS9 (CBD	Cloud & Big Data +	Prof. Anil Kumar Singh, MNNIT Allahabad	5054	8-12-2019
+ CS)	Computer & Software	Dr. Manish Kumar, IIIT Allahabad		
TS10	Mixed Signal Design	Dr. Prasanna Mishra, IIIT Allahabad	5007	8-12-2019
(MSD)				
TS11	Ph.D. Symposium	Dr. Neetesh Purohit, IIIT Allahabad	5055	8-12-2019
		Prof. Uma Shanker Tiwary, IIIT Allahabad		
		Prof. Aditya Trivedi, IIITM Gwalior		
		Prof. Prakash D. Vyavahare, SGSITS Indore		
		Prof. M. M. Gore, MNNIT Allahabad		
TS12	Intelligent Systems and	Prof. S.P. Singh, MMMUT	5006	8-12-2019
(IS&HCI +	HCI + Natural Language	Dr. T. Pant, IIIT Allahabad		
NLP)	Processing.			
TS13	Miscellaneous Papers	Dr. S.R. Pandian, IIIT Kancheepuram	5007	8-12-2019

Keynotes

Saturday, December 07, 10:00 AM – 10:45 AM

Prof. P. Nagabhushan Director & Patron (IIIT Allahabad)



Biography: Prof. P. Nagabhushan is the Director and professor in Computer Science and Engineering in IIIT Allahabad. He has completed his B.E in 1980, M.E. in 1983 and PhD in 1988. He was a Fellow of Institution of Engineers (FIE) in 2002 and fellow of Institution of Electronics and Telecommunication Engineering (FIETE) in 2010. He worked as a professor in SJ College of Engineering, Mysore and University of Mysore from 1994 and 1996 respectively. Dr. Nagabhushan worked as a Chief Nodal Officer in Choice based Credit Pattern Continuous assessment Education system, University of Mysore. There, he also worked as a Chairman of

academic Reformation Committee. Formerly, he was a distinguished professor and chairman in Amrita Vishwavidyapeetam, Amrita University, Coimbatore And worked as director in 2 institutes, in BESTER, i.e. Bangalore Educational Society for Technology Advancement and Research and in BTI, Bangalore Technological Institute, Bangalore.

Prof. Sokratis Katsikas Professor, NTNU Norway

Saturday, December 07, 3:00 PM - 3:45 PM



Keynote Topic: Towards a secure Industrial Internet of Things: Trends and Challenges Biography: Sokratis K. Katsikas received the Diploma in Electrical Engineering from the

University of Patras, Patras, Greece in 1982, the Master of Science in Electrical & Computer Engineering degree from the University of Massachusetts at Amherst, Amherst, USA, in 1984 and the Ph.D. in Computer Engineering & Informatics from the University of Patras, Patras, Greece in 1987. In 2019 he has awarded a Doctorate Honoris Causa by the Dept. of Production and Management Engineering of the Democritus University of Thrace, Greece. He is the Rector of the Open University of Cyprus, Nicosia, Cyprus, and Professor with the Center for Cyber and

Information Security, Department of Information Security and Communication Technology, Norwegian University of Science and Technology, Norway. His research interests lie in the areas of information and communication systems security and of estimation theory and its applications. His research activity over the past 30 years has resulted in the publication of 39 books; 35 book chapters; 86 journal publications (of which 9 invited); and 130 publications in conference proceedings (of which 30 invited). According to Googlescholar, his research work has been cited 3.298 times and his h-index is 29. He has participated in more than 60 funded national and international R&D projects in his areas of research interest. He is serving on the editorial board of several scientific journals, and has served on/chaired the technical programme committee of more than 600 international scientific conferences. He chairs the Steering Committee of the ESORICS Conferences.

Prof. Gaurav Sharma Professor, University of Rochester

Saturday, December 07, 3:45 PM – 4:30 PM



Biography: Gaurav Sharma is with the University of Rochester, where he is a Professor in the Department of Electrical and Computer Engineering, Department of Computer Science, and Department of Biostatistics and Computational Biology. He is also a Distinguished Researcher in Center of Excellence in Data Science (CoE) at the Goergen Institute for Data Science. From 2008-2010, he served as the Director for the Center for Emerging and Innovative Sciences (CEIS), a New York state supported center for promoting joint university-industry research and technology development, which is housed at the University of Rochester. From 1996 through 2003, he was with Xerox Research and Technology in Webster, NY first as a member of

research and technology staff and then as a Principal Scientist and Project Leader. He received the Ph.D. in Electrical and Computer Engineering from North Carolina State University, Raleigh, NC, and master's degrees in Applied Mathematics from NCSU and in Electrical Communication Engineering from the Indian Institute of Science, Bangalore, India. He received his bachelor of engineering degree in Electronics and Communication Engineering from Indian Institute of Technology, Roorkee (formerly, Univ. of Roorkee).

Prof. Sandeep Shukla Professor, IIT Kanpur

Sunday, December 08, 10:00 AM - 10:45 AM



Keynote Topic: Cyber Security of Critical Infrastructures: A C3I Perspective

Biography: Prof. Sandeep K. Shukla is the head of the Computer Science and Engineering department of Indian Institute of Technology Kanpur. He is an IEEE fellow, ACM Distinguished Scientist, and currently the editor-in-chief of the ACM Transactions on Embedded Computing Systems. He has been a recipient of the SERB Ramanujan fellowship, Humboldt Bessel Award, Presidential Early Career Award, a distinguished Alumni award from the State University of New York at Albany etc. He was a professor at Virginia Tech until 2015 when he moved to IIT Kanpur as the Poonam and Prabhu Goel Chair Professor.

He also worked for Intel Corporation, GTE Laboratories and several visiting positions at MIT, INRIA, Technical University of Kaiserslautern, Germany etc. He has published over 250 articles and papers, and has written and edited 10 books. His research interests are in cyber security and blockchain technology.

Prof. Shekhar Verma Professor, IIIT Allahabad

Biography: Dr. Shekhar Verma is currently working as professor in Dept. of Information Technology, IIIT Allahabad. He has completed his B.Tech., M.Tech, and PhD from IIT BHU. His research areas are Wireless Sensor Network, Cryptography, Cloud Computing. He has published around 75 journal articles and represented his research work in around 80 national and international conferences.

Abstract of Presentations on December 6th

TS-2 (SIVP)

[04:45 PM-06:15 PM, Room No: 5055]

1. Glaucoma Detection using Fuzzy C-means Optic Cup Segmentation and Feature Classification. [Paper ID- 055]

Rakshita Karmawat, Neha Gour and Pritee Khanna (Indian Institute of Information and Technology, Design and Manufacturing, Jabalpur)

Ophthalmological diseases cause damage to various parts of human retina. Glaucoma damages optic disc which may lead to progressive irreversible vision loss. Early diagnosis and detection helps in prevention of vision loss and improves the quality of life of patients. The proposed method aims to develop a glaucoma detection system using fundus images. The method focuses on optic cup segmentation using fuzzy c-means (FCM) algorithm. Fusion of segmentation based and global image based features is used for categorizing fundus images into normal and glaucoma classes using support vector machine (SVM) and ensemble classifiers on fundus images. Optic cup segmentation and glaucoma classification results are evaluated on publicly available Drishti-GS1 database using relevant performance metrics and compared with methods in literature.

Keywords—Glaucoma Detection, Optic Cup Segmentation, HOG, DWT, Fuzzy C-Means.

2. An Automatic Cell Nuclei Segmentation based on Deep Learning Strategies [Paper ID- 066]

Ayush Mandloi, Ushnesha Daripa, Mukta Sharma, and Mahua Bhattacharya (ABV-Indian Institute of Information Technology and Management)

Automatic analysis of histopathology specimens images can be utilized in early extraction and detection of diseases such brain tumor, breast malignancy, colon cancer etc. The early detection of cancer may allow patients to take proper treatment. In this paper, an automatic cell nuclei segmentation based on deep learning strategies using 2-D histological images is proposed. In the proposed approach U-Net architecture is used and its hyper parameters are tuned to segment the cell nuclei. The proposed solution is built upon the highly adaptive nature of U-Net architecture. The task of nuclei segmentation in the proposed approach includes detection of nuclei in an image and extracting the foreground, while segmenting the connected foreground area into separated nuclei masks. In the experimental results the proposed approach is tested using the dataset having histopathological cell images of breast cancer. The results shows that the proposed deep learning based approach achieved the 86% average accuracy in segmentation of cell nuclei and also outperforms the other deep learning architectures.

Keywords—Deep Learning, Histopathology Images, Hyper Pa-rameters, Nuclei Segmentation, U-Net Architecture.

3. A Machine Learning Algorithm for No Reference Image Quality Assessment using Non-Subsampled Contourlet and Curvelet Transform. [Paper ID- 068]

Kiruthika S, Masilamani V (IIITDM Kancheepuram)

Image quality assessment (IQA) predicting the quality of an image has lots of application in the communication area and entertainment industry. The IQA without any reference image needs to be done in several practical situations. For Instance, to measure the image quality after decompression, the reference image will not be available. In such cases, measuring the IQA without a reference image is a challenging problem. The proposed algorithm is experimentally found to be more efficient than well-known algorithms. We use the transforms such as Curvelet Transform and Non-Subsampled Contourlet Transform (NSCT) and we fit the coefficients of NSCT in Asymmetric Generalized Gaussian Distribution(AGGD). We found that this fit is a better fit among several distributions that we explored. Support Vector Regression (SVR) is used for finding the quality measure of an image and SVR is using features derived out of AGGD and Curvelet Transform coefficients. The performance of the proposed algorithm is experimentally found to be efficient on the standard database.

Keywords— no reference, image quality, regression, curvelet, NSCT, AGGD

4. DCT-CompCNN: A Novel Image Classification Network Using JPEG Compressed DCT Coefficients. [Paper ID- 079]

Bulla Rajesh, Mohammed Javed, Ratnesh and Shubham Srivastava (Indian Institute of Information Technology, Allahabad)

The popularity of Convolutional Neural Network(CNN) in the field of Image Processing and Computer Vision has motivated researchers and industry experts across the globe to solve different challenging research problems with high accuracy. The simplest way to train a CNN classifier is to directly feed the original RGB pixel images into the network. However, if we intend to classify images directly with its compressed data, the same approach may not work better, like in case of JPEG compressed images. This research paper investigates the issues of modifying the input representation of the JPEG compressed data, and then feeding into the CNN. The architecture is termed as DCT-CompCNN. This novel approach has shown that CNNs can also be trained with JPEG compressed DCT coefficients and subsequently can produce a good performance similar to the conventional CNN approach. The efficiency of the modified input representation is tested with the existing ResNet-50 architecture and the proposed DCT-CompCNN architecture on a public image classification dataset like CIFAR-10, Dogs vs Cats and MNIST datasets, reporting a better performance.

Keywords— Compressed Data; DCT Based CNN; Classification; JPEG Compression; Transfer Learning; DCT Coefficients; Faster Networks; DCT-CompCNN;

5. Abnormality classification in the kidney ultrasound images using singular value decomposition features.

[Paper ID- 089]

Sudharson S. and Priyanka Kokil (Indian Institute of Information Technology Design and Manufacturing)

Kidney diseases are evolving as a common chronic disease like hypertension, diabetes, and cardiovascular disease. They do not show any significant symptoms at an earlier stage. Therefore, monitoring of kidney diseases at regular interval of time is required to prevent kidney failure. This paper deals with the automatic abnormality classification in the kidney ultrasound images. The singular value decomposition (SVD) algorithm is used to extract features from ultrasound images and these features are given to the support vector machine (SVM) classifier for classification. The performance comparison of SVM is done with different classifiers along with the extracted SVD features to detect the abnormalities. The kidney classes are classified in to normal and abnormal kidney with a total of 100 ultrasound images. The efficiency of the classifier is measured in terms of recall, selectivity and accuracy.

Keywords-- Singular value decomposition, Support vectormachine, Recall, Selectivity.

6. Weapon Classification using Deep Convolutional Neural Network. [Paper ID- 122]

Neelam Dwivedi, Dushyant Kumar Singh and Dharmender Singh Kushwaha (MNNIT Allahabad, Prayagraj)

Increasing crimes in public nowadays pose a serious need of active surveillance systems to overcome such happenings. Type of weapon used in the crime determines its seriousness and nature of crime. An active surveillance with weapon classification can help deciding the course of action while identifying the possibilities of any crime happening. This paper presents a novel approach for weapon classification using Deep Convolutional Neural Networks (DCNN). That is based on the VGGNet ar- chitecture. VGGNet is the most recognized CNN architecture which got its place in ImageNet competition 2014, organized for image classification problems. Thus, weights of pre-trained VGG16 model are taken as the initial weights of convolutional layers for the proposed architecture, where three classes: knife, gun and no-weapon are used to train the classifier. To fine tune the weights of the proposed DCNN, it is trained on the images of these classes downloaded from internet and other captured in the lab. Experiments are performed on Nvidia GeForce GTX1050 Ti GPU to achieve faster and exhaustive training on a large image set. A higher accuracy level of 98.41% is achieved for weapon classification.

Keywords—weapon, deep convolutional neural networks, VGG16, Model A, Model B

7. GLCM Based Feature Extraction and Medical X-RAY Image Classification using Machine Learning Techniques. [Paper ID- 062]

Pawan Kumar Mall, P K Singh and Divakar Yadav (Madan Mohan Malaviya University of Technology, Gorakhpur)

The machine learning and artificial intelligence play a vital role to solve the challenging issues in Clinical imaging. The machine learning and artificial intelligence ease the daily life of both medical practitioner and patient's. Nowadays automatic system is designed with high accuracy to perceive abnormality in bone X-ray images. To achieve high accuracy system has less resource available image pre-processing tools are used to enhance the medical images quality. The image pre-processing involves the process like noise removal and contrast enhancement which provides instantaneous abnormality diagnosis system. The Gray Level Co-occurrence Matrix (GLCM) texture features are widely used in image classification problems. GLCM represents the second- order statistical information of gray levels between neighboring pixels in an image[1]. In the paper we implemented different machine learning approaches to classify the bone X-ray images of MURA (musculoskeletal radiographs) dataset into fractures and non fracture category. The four different classifiers LBF SVM (Radial Basis Function support vector machine), linear SVM, Logistic Regression and Decision tree are used for abnormality detection. The performance evaluation of the above abnormality detection in X-ray images is performed by using five statistical parameters such as Sensitivity, Specificity, Precision, Accuracy and F1 Score which shows significant improvement.

Keywords—Machine Learning; GLCM, LBF SVM, Linear SVM, Logistic Regression, Decision Tree, MURA, Bone Fractures

8. Model Independent Method For Acceptor Splice Site Prediction In DNA Sequences. [Paper Id- 106]

Sunil Datt Sharma, Sanjeev Narayan Sharma and Rajiv Saxena (Jaypee University of Information Technology, Waknaghat, H.P.)

Signal Processing plays a very important role in the annotation of genome data. It helps to find out different structural features present in the DNA sequences like exonic regions, intronic regions, untranslated regions, promoter regions, CpG islands, etc. The detection of the exonic regions (protein coding regions) is very important for accurate gene prediction and functional annotation. The accurate identification of exonic regions is associated with the prediction of acceptor and donor splice sites. In this work, adaptive short time Fourier transform (ASTFT), period-3 measure, and principal component analysis (PCA) based model independent method for the acceptor site prediction has been proposed. The performance of the proposed method has been compared with the windowed discrete Fourier transform (WDFT).

Keywords—DNA sequences, splicesites, short time Fourier transform

TS-3 (WCIT)

[04:45 PM-6:15 PM, Room No: 5054]

9. Towards a Vehicle's behavior monitoring and Trust Computation for VANETs. [Paper ID-021]

Anmol Tigga and Arun Raj Kumar Parthiban (NIT Puducherry)

Vehicular Ad-hoc NETworks (VANETs) create an Intelligent Transportation System (ITS) by eradicating the accidents and traffic congestion on the roads and highways. In VANETs, there are three types of communication viz., Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I), and Vehicle to Everything (V2X). A malicious node may communicate a fake message (road congestion, accident, etc.) to other vehicles in the network. Therefore, there is a need for detecting the genuinity of the message. The existing detection systems in literature fail due to high computational complexity, less detection accuracy, etc. In this paper, a trust and behavior monitoring system is proposed using Neuro-fuzzy technique to differentiate the fake messages from the legitimate messages. From the experimental results, it is evident that our proposed system achieves high detection accuracy and low computational complexity.

Keywords—VANET, Neuro-fuzzy, Behavior value (BV), ITS, Security.

10. On Robust Pre-coder Design for Energy-Efficient MIMO-Cognitive Relay Networks. [Paper ID- 026]

Shikha Maurya and Matadeen Bansal (PDPM-IIITDM JABALPUR)

This paper considers the robust relay precoder design problem for multi-input multi-output cognitive relay networks (MIMO-CRNs), where a pair of secondary user (SU) communicates through an amplify-and-forward (AF) halfduplex (HD) relay in the presence of a primary user (PU). The channel state information (CSI) of the relay-PU channel at the relay node is assumed to be imperfect. The channel imperfection is considered in the form of channel uncertainties, which is modelled by using the ellipsoidal model. Taking into account the imperfect CSI, we design the robust relay precoder to maximize the energy efficiency (EE) of the secondary system subject to the total interference and transmit power constraints. An efficient solution, based on the constraint relaxation and the fractional programming theory, is proposed to tackle the robust precoding problem. Numerical results demonstrate that the proposed robust relay precoder scheme maximizes the EE of the SU while securing the transmission of the PU by satisfying the interference constraint for different channel uncertainties.

Keywords—cognitive radio, energy efficiency, imperfect CSI, relay, MIMO.

11. Improving Spectral Efficiency for Device-to-Device Data Offloading in Underlay Cellular Networks. [Paper ID- 031]

Palash Kundu, Mohit Mahata, Manoj Rana and Bhaskar Sardar (Jadavpur University)

Device-to-Device (D2D) communications underlying cellular networks have been becoming a promising technology to improve spectral efficiency in next generation wireless networks. As an emerging paradigm, it decreases latency, increases coverage, and enhances performance of the network in terms of spectral efficiency (SE) of the network. However, the problem of interference imposes a great technical challenge to radio resource allocation in underlay D2D communications. Due to inherent nature of consuming high speed low cost data, D2D enabled cellular devices can switch from licensed cellular network to integrated unlicensed cellular networks by changing underlay D2D mode to unlicensed cellular mode named as global offloading. We study how in global offloading, D2D devices release scare shared resources and reduce interference resulting improvement of SE of the cellular network. We also propose a probabilistic model based on macro- to-femto cell changing probability of D2D devices, and apply the proposed modeling technique on basic Shannon based interference management scheme, optimal resource sharing scheme, and interference-aware graph based scheme to obtain SE of the cellular network with respect to different percentages (e.g., 25%, 50%, and 75%) of resource blocks released by D2D devices during global offloading in all three schemes.

Keywords—Device-to-Device Communication; Offloading; SINR; Spectral Efficiency

12. An Authenticated and Secure Electronic Health Record System. [Paper ID- 051]

Varun Shukla, Anchal Yadav and Arpit Mishra (Pranveer Singh Institute of Technology)

Now a day's electronic health record (EHR) systems are in vogue. Many big countries like Australia and China are implementing new secure ways to store patient's data. This data can be analyzed in variety of purposes. It is very important to mention that this data or the access to this data has to be secured. If an intruder has unauthorized access to this data then the entire system is in trouble. In this paper, we present an innovative and secure method to store patient health record (when the patient is in medical observation) which is useful in emergency situations as well.

Keywords—Authentication, Electronic Health Record (EHR), Encryption, Security

13. Optimized Hybrid Clustered Protocol for IoT Heterogeneous Wireless Sensor Networks. [Paper ID- 056]

Rahul Prakash, Parul Kansal, Varun Kumar Kakar (Bipin Tripathi Kumaon Institute of Technology, Dwarahat Almora)

In recent years the Wireless Sensor Networks become very popular because of the advancements and innovation in the micro-electro-mechanical system [1] (MEMS) which creates more opportunities to utilize the WSN with their outstanding capability of sensing various type of environments as well as other physical conditions [2]. WSN

consists of huge number of small and less expensive sensor nodes, these nodes communicate with one another with different set of rules called protocols. Performance of these sensor nodes generally affected by some set of rules by which they perform in the network these are called protocols. Nodes are mostly operated on battery power therefore the energy utilization will always be the prime concern of WSNs. The Same analogy is applied for the WSN in the Cyber-Physical [2] system and for IoT environment. Where different types of nodes or end devices have been found with different amount of initial energy. This paper optimizes the existing routing protocol and proposes a different protocol with improvised features such as new data relaying scheme and improved CHs selection procedure. Thereby linking the difference between the real world Wireless Sensor Networks and the genuine heterogeneous IoT [3] environment. The simulation results shows the comparison between the Hy- IoT [2] and proposed protocol by using the performance measures shown in the result section.

Keywords— Wireless Sensor Network (WSN), Internet of Things (IoT), (Hy-IoT) Hybrid IoT, Cluster heads (CH), Routing protocols, Micro-Electro-Mechanical-System (MEMS), BS (Base Station), Sink Node

14. Spatial Correlation Based Device Level Clustering for IoT. [Paper ID- 113]

Anubhav Shivhare, Manish Kumar Maurya, Vatsal Saglani, Manish Kumar and Ajay Kumar Bharti (Indian Institute of Information Technology, Allahabad)

The advent of IoT has ushered an era of demands for new and intelligent schemes to manage the network without compromising on the network lifetime. Clustering of sensor motes in a network plays a vital role in IoT. Many research works are proposed for clustering the sensor motes based on the distance between each sensor motes to optimize the network lifetime. Moreover, recent advancements do not focus on spatial correlation information of a sensor mote along with its location information. The authors propose a novel scheme for device level clustering in multi-modal IoT network which takes spatial infor- mation into account for clustering of devices. Thus the research work highlights the importance of clustering methodology based on spatial correlation. Further, standard correlation metrices like Pearson's, Kendall's and Spearman's correlation were used to evaluate the performance of the proposed scheme. A comparison of deviation in cluster member nodes is also done to show the effectiveness of the scheme in load balancing.

Keywords—correlation, clustering, IoT, sensor motes.

15. Reinforcement learning based energy management in wireless body area network: A Review. [Paper ID- 150]

Arti Gupta, Manish Kumar Maurya and Vijay Kumar Chaurasiya (Indian Institute of Information Technology, Allahabad)

In modern life, personal health-care awareness is a fast-growing revolution. In which, Wireless Body Area Network (WBAN) allows inexpensive health-care services with the evaluation of modern devices. In particular, WBAN devices such as in-body sensors and coordinator become more decentralized and autonomous. Moreover, reinforcement learning type of ma- chine learning is formulated to lead the WBAN devices to make an autonomous decision such as sensor access control, transmit power control, security against attack to improve the network performance, quality of service (QoS) and increase the overall utility of the network in an optimized way. In this paper, we provide a literature review about WBAN and its application, challenges and issues. Finally, we present the application of Reinforcement Learning has appeared with the sophisticated solution in the WBAN.

Keywords—Reinforcement Learning, Q-learning, WBAN, m-health, power control, energy harvesting.

16. Energy Conservation Schemes for Wireless Sensor Networks: Survey. [Paper ID- 171]

Gagandeep Kaur, Mahua Bhattacharya and Prasenjit Chanak (ABV-Indian Institute of Information Technology and Management, Gwalior)

The wireless sensor networks are formed from the network of sensors capable of sensing the physical phenomenon around like heat, light, motion, temperature, humidity, pressure etc. Sensors are tiny shape and deployed in mostly remote areas. The journey of data in the form of packets from the sensor mote to sink underwent many challenges .Huge research is carried to efficiently path the information and utilize the energy judiciously. Sensing ,transmitting and receiving the packets and route it to the sink requires high range of power consumption. So, in recent times research is booming in the area of energy saving mechanisms. In the present paper we describe recent researches and classifications of the energy saving techniques of wireless sensor networks like unequal clustering, data acquisition through mobile sinks, energy efficient routing protocols.

Keywords-Wireless sensor networks, clustering, energy efficient routing protocols, unequal clustering, mobile

sink, data dissemination, energy hole.

17. Efficient Method for Data Synchronization in Mobile Database. [Paper ID- 036]

Nidhi Singh and Muzammil Hasan (Madan Mohan Malaviya University of Technology, Gorakhpur)

In the present era, the use of mobile gadgets is increasing, the process of such mobile gadgets has a limited processing, bandwidth, memory and transfer speed, for which proper resolution is necessary. In a versatile Processing situation, there are many issues like synchronization in the database, the security of the information and portable exchanges. One of the major challenges in the Mobile database is Synchronization. Multiple analyzes are conducted over time to minimize these problems in order to maintain better accuracy. While synchronization requires the accuracy of data to expect a high volume of traffic and high time complexity and to develop appropriate algorithms to synchronize such problems. This paper we consist the current situation of data synchronization and give a new and better concepts for understanding the synchronization. It also helps to control problems of data deployment and maintains the possibilities of accurate data using a new solution for data synchronization.

Keywords— Mobile Database, Synchronization, Mobile- side Database, Server-side Database, Mobile Computing, Message Digest.

TS-4 (CI & ML)

[04:45-06:15 PM, Room No: 5007]

18. An Introduction And Review On Machine Learning Applications In Medicine And Health Care. [Paper Id- 042]

Preeti Singh, S. P. Singh and D. S. Singh (MMMTU, Gorakhpur, India)

Machine learning techniques can extensively apply in the solution of the medicine domain problems by applying classification models and systems that can support medical personnel in the diagnosis and predication of diagnosis diseases. Though, it's hard to extract knowledge and information from medical records and data because this data and information is in mixed, unorganized, and high dimensional. This data also contains noise in collected data and outliers exist in collected data. Main applicable method will be used applies by checking different machine learning techniques. The performance of machine learning technique is checked by verifying and validating machine learning techniques' performances through accuracy. Present research paper has been discussing about the usability and applicability of different machine learning techniques i.e. decision tree algorithm, support vector machine method, random forest method, evolutionary algorithms based models and swarm intelligence based techniques in the diagnosis of a disease is extensively used by doctors. In view of the fact that analyzing medical images is very complex and difficult task, by using machine learning methods for analysis of imaging will support and give major help in disease diagnosis. Application of different Machine learning methods is used by applying its techniques on big data for interpretation for diagnosis because machine learning methods show their capability and shows their easiness to solve the problems of bioinformatics domain.

Keywords-- Decision Tree, Machine Learning, Medicine, Random Forest, Support Vector Machine.

19. Defect Classification For Silk Fabric Based On Four Dft Sector Features. [Paper Id- 058]

Shweta Loonkar and Dhirendra S (Mukesh Patel School of Technology Management & Engineering, NMIMS University, Mumbai)

The world without a textile and textile industry is impossible to imagine. Vital role is played by textile industry in today's world of business. Quality inspection, reliability, durability and fabric with less defects are an important factors for good apparel organizations. Fabric defect classification holds an inimitable position in demand of worthy products. In this paper experimentation has been done to classify the fabric defects for silk material based on its structural failures. In this DFT sectorization process on TILDA textile images to extract features in order to classify the defects has been used. The Feature Vector Database (FVDB) is generated by means of four DFT sectors. FVDB is used as input in WEKA for defect classification based on two test options i.e. 10-fold cross validation and full training set. It has been observed that the rate of classification for silk cloth declines in 10-fold cross validation as compared to full training set. All characterization calculations are analyzed dependent on their accuracy and Kappa statistics. It was noticed that the Random Forest is most efficient algorithm for defect classification for silk fabric

due to its high rate of classification.

Keywords-- FVDB, Random Forest, Sectorization, Cross Validation, Full Training Set, Grid Search, Classification Rate, WEKA

20. Emergency Signal Classification for the Hearing Impaired using Multi-channel Convolutional Neural Network Architecture. [Paper ID- 080]

Swarup Padhy, Juhi Tiwari, Shivam Rathore and Neetesh Kumar (Atal Bihari Vajpayee Indian Institute of Information Technology and Management Gwalior)

Hearing impaired people have to tackle a lot of challenges, particularly during emergencies, making them dependent on others. The presence of emergency situations is mostly comprehended through auditory means. This raises a need for developing such systems that sense emergency sounds and communicate it to the deaf effectively. The present study is conducted to differentiate emergency audio signals from non-emergency situations using Multi-Channel Convolutional Neural Networks (CNN). Various data augmentation techniques have been explored, with particular attention to the method of Mixup, in order to improve the performance of the model. The experi-mental results showed a cross-validation accuracy of 88.28% and testing accuracy of 88.09%. To put the model into practical lives of the hearing impaired an android application was developed that made the phone vibrate every time there was an emergency sound. The app could be connected to an android wear devices such as a smartwatch that will be with the wearer every time, effectively making them aware of emergency situations.

Keywords—sound classification, multi-channel, audio data augmentation, mixup, assistive technology, convolutional neural networks, mel spectrograms

21. Malaria Parasite Recognition in Thin Blood Smear Images using Squeeze and Excitation Networks [Paper ID- 088]

Dr Somesh Kumar, Shivendra Pratap Singh, Prakhar Bansal and Pankaj Srivastava (ABV-Indian Institute of Information Technology & Management Gwalior)

Malaria is a blood disease that is caused by the Plasmodium parasites transmitted through the bite of female Anopheles mosquito. To detect the existence of this parasite, the experts usually examine the thin blood smears. However, this requires considerable expertise in order to precisely make a distinction between the two categories. The result is that methods fail when the task of classification is largely-scaled. In recent times, researchers have started using machine learning techniques which require careful analysis of morphological, textural, and positional variations of the region of interest(ROI) in order to extract hand-engineered features. In this study, we tend to present an advanced method to automate the above process based upon the pre-trained CNN based model, SeNet. This model acts as a feature extractor towards classifying parasitized and uninfected cells. To carry out the process, we have used the dataset of microscopic images of red blood cells provided by United States National Library ofMedicine. Our results show that the model achieved an accuracy of 97.24% in identifying the malarial parasite in red blood cells. The AUC/ROC score (Area under Curve) came out to be around 0.97. The training loss was calculated using Categorical Cross-Entropy which was around 0.075. Statistical validation of the outcomes reveals the use of pre-trained CNNs as a favorable tool for feature extraction for this purpose.

Keywords – CNN, confusion matrix, neural network, blood cells, machine learning

22. Development of An Improved Tomato Leaf Disease Detection And Classification Method. [Paper Id- 091]

Manpreet Kaur (Punjabi university)

Detection of the plant leaf diseases in earlier stage is beneficial for Indian Economy. The study shows the 10-30% of crops are damaged due to diseases, which is not detected in curing stage. Different leaf disease detection methods are used for different crops. The pretrained Deep Learning Model is used to detect and classify the Tomato Leaf diseases. Dataset of the Tomato Leaf Images is collected from plant village repository. It is divided into categories, six diseased and one healthy. The implementation is done in MATLAB®. Features are extracted from the Feature Layer of the Pre-trained model of ResNet i.e. Fully Connected Layer. It is used to train the model for tomato leaf dataset. The training and testing are defined in a separate phase. The classification is done by the linear learner of the ECOC. It returns a pool trained multiclass error correcting model. To evaluate the trained model various parameters are calculated. The proposed model is able to classify the diseases has a higher Accuracy, Precision, F-Score, Specificity and False Positive Rate. The results of trained model are found to be more accurate than base article.

Keywords— Leaf, Detection, Classification, Deep Learning, ResNet, ECOC

23. Mitosis Detection Using Image Segmentation and Object Detection. [Paper ID- 107]

Nairit Banerjee, Anmol Singh Sethi, Manavdeep Singh, Srisha Anagh G, Upendra Badnena Svvr, Artus Krohn-Grimberghe, and Ranjana Vyas (Indian Institute Of Information Technology, Allahabad)

The World Health Organisation(WHO) identifies that in women, the second most cancer deaths are caused by Breast cancer[1]. This paper presents various approaches for Mitosis detection on publicly available MITOS data set and DSB (Data Science Bowl). The process involves using a U-Net architecture consisting of convolution and deconvolution layers to perform the image segmentation. On the segmented image, YOLO algorithm is used to perform the object detection, thus forming bounding boxes around the nuclei. The next task involves the classification of nuclei into either mitotic or amitotic which is achieved with help of one class SVM. The results achieved on the data sets were able to prove that the process followed got good results for mitosis detection on histology images.

Keywords—Mitosis, segmentation, U-Net, YOLO, object detection, object classification.

24. Early classification of time series based on uncertainty measure. [Paper ID- 120]

Anshul Sharma and Sanjay Kumar Singh (Indian Institute of technology (BHU))

The early classification of time series data is a critical problem in many time-sensitive applications such as health informatics. Where the prediction of class value, as early as possible, is highly valuable while preserving the accuracy as on full-length sequence data. For example, early diagnosis can provide better treatment to the patient or even save their lives. The aim of early classification is to analyse the sequence data at each time point continuously and predict the class label when a sufficient amount of data is available. Thus, the decision of early classification is a challenging task that needs to be addressed. Therefore, in this work, we propose an early classification model which relies on a set of probabilistic classifier and a confidence threshold that is measured in term of uncertainty. Formally, our model is divided into two parts. i) Learning phase, define the safeguard point for each class so that it makes sense to predict the label of any sequence with some acceptable accuracy. These safeguard points are identified based on user-defined accuracy. ii) Prediction phase, classify the time series only if the uncertainty of probabilistic output lie under the confidence threshold, that is obtained in the learning phase. We have evaluated our proposed model for 15 UCR datasets and compared with baseline state- of-art methods. Results clearly show that our proposed model is significantly better in term of early classification.

Keywords-Classification, Early Classification, Time series, Confidence measure

25. Regularized Encoder-Decoder Architecture for Anomaly Detection in ECG Time Signals. [Paper ID- 148]

Ashutosh Chandra and Rahul Kala (Indian Institute of Information Technology, Allahabad)

Electrocardiography (ECG) is a procedure to record the electrical activity of the human heart. The recorded time series ECG signal are often used by medical professionals to detect any arrhythmia the subject may have. Work has been done to automate the task by modelling the problem as anomaly detection using encoder-decoder based techniques, training on just normal data and using distribution of loss to predict normal or abnormal data. We argue that normal encoder-decoder with just reconstruction loss suffers from two problem: 1. Latent vector is not smooth and continuous, which might lead to memorising signals 2. Network is prone to outliers as mean squared error is used for reconstruction loss. We propose a regularised encoder- decoder based architecture with KL divergence as regulariser for latent vector which solves the above two problem. The regulariser will enforce the network to minimise the distance between latent vector distribution and normal distribution, hence making latent vector smooth and continuous, at the same time as diverse as possible. We have experimented with various architectures such as Multilayer Perceptrons, Recurrent Neural Networks, Long Short Term Memory Networks, 1D Convolutional Neural Networks for encoder and decoder and found that regularised network outperforms normal network in all the cases. More specifically our regularised network with F1-score of 0.90 outperformed the current state of art for ECG anomaly detection which uses Long Short Term Memory networks for both encoder and decoder, resulting in F1score of 0.88. As a result we present a regularise encoder-decoder network in this paper which outperforms current techniques for anomaly detection on ECG data.

Keywords—Anomaly detection, Heart diseases, Lifestyle dis- eases, Medical expert system, Encoder, Decoder, Regularisation

26. Zero Shot Learning using Active Learning. [Paper ID- 157]

Kumar and Krishna Pratap Singh (Indian Institute of Information Technology, Allahabad)

Zero shot learning seeks to learn useful patterns in the source domain and identify novel concepts in the target domain. This transfer learning paradigm has recently gained immense popularity given the inherent limitations in data acquisition and subsequent annotation for a task (or domain). While typical zero shot learning methods utilize all the classes (and their instances) in the source domain in a passive way, we, in our work, actively use only a handful of relevant classes for learning in the source domain. With this intelligent data subset, we jointly learn the source and target domain parameters using coupled semantic autoencoders. This joint learning reduces the projection domain shift problem. We further extend the above model for word embedding based semantic space as well. For classes with no word embedding, we have solved prototype sparsity problem by training a neural network with all classes that has one. This neural network seeks to learn a mapping from attribute space to word embedding space. Experiments on AWA2 and CUB-UCSD datasets confirm the superiority of our hybrid approach over state of art methods by up to 16% and 8% in attribute and word embedding space respectively.

Keywords—Entropy, Active Learning, Zero Shot Learning, Semantic Autoencoder, Joint Learning, Embedding space, Tied weights, Projection domain shift, Cosine Proximity, Class prototype sparsity problem.

27. Supply and Demand Planning Of Electricity.

[Paper ID- 072]

Shalini Perera, Sathya Dissanayake, Sehan Desilva, Dinithi Fernando and Windhya Rankothge (Sri Lanka Institute of Information Technology)

Electrical energy is one of the fastest growing energy demands in the world. Uncertainty in supplying the demand can threaten the social economic aspects of a country. Thebiggest driver of electrical demand is weather. Climatic changes not only affect the demand but also renewable energy supply.Wind and Solar are two alternative energy sources with less pollution. We have proposed a platform which helps energy providers, energy traders with services related to electricity supply and demand planning, with following modules. (1) Forecasting Electricity consumption patterns (2) Forecasting wind power generation (3) Optimizing Load Shedding.Our platform has been implemented using statistical and machine learning techniques: Multi-Linear Regression for consumption prediction, Random forest regression for wind power forecast, and genetic algorithm to optimize load shedding.Our results show that, using our proposed module, we can minimize the imbalance between the supply and demand of electricity by predicting the consumption patterns of consumers, predicting the wind power generation and by selecting the best feeder to be selected for load shedding under given constraints.

Keywords—customer consumption forecast, wind power forecasting, optimizing load shedding, machine learning, deeplearning, optimization

28. Breast Cancer Recurrence Prediction Using Machine Learning. [Paper ID- 047]

Kaustubh Chakradeo, Sanyog Vyawahare, Pranav Pawar (Smt. Kashibai Navale College of engineering)

The most common cancer among women is breast cancer. Around 12% of women are affected by it all over the world. Recurrent breast cancer is a term used for breast cancer which returns even after a successful treatment. This research aims to use Machine learning to detect and predict the recurrence of breast cancer; and compare all the models by using different metrics like accuracy, precision, etc. The models built can help predict the recurrence of breast cancer Dataset(WPBC). The models built are Multiple Linear Regression, Support Vector Machine, which was build by using RBF Kernel and Leave-One-Out(K-fold Cross-Validation) and Decision Tree using metrics like Gini Index, Entropy andInformation Gain. Support Vector Machine and K-fold Cross-Validation gave the best results for recurrence and non-recurrence predictions.

Keywords-- Breast Cancer, Recurrence, Prognosis, SVM, Regression, Decision Tree

Abstract of Presentations on December 7th

TS-5 (SIVP)

[11:45 AM-01:30 PM, Room No: 5055]

29. Partitioned Based Image Segmentation. [Paper ID- 123]

Sameeksha Shrivastava and Ajay Kumar (Jaypee University of Engineering and Technology, Guna, M.P.)

The aim of this paper is to provide a comprehensive survey of image segmentation method using clustering techniques. In image processing, segmentation plays an important role in the detection and matching of objects. Image segmentation uses number of techniques to find the correct segmented images. Clustering techniques are one such methods used for the segmentation of images. It is the process by the pixels of an image are divided into different partitions on the basis of similarity criteria. This paper presents recent development in image segmentation by using the clustering-based approaches such as K- Means and Fuzzy C-Means.

Keywords— Fuzzy C-Means, Clustering, K-Means, Image segmentation

30. An Approach for Human Machine Interaction using Dynamic Hand Gesture Recognition [Paper ID- 125]

Mohd. Aquib Ansari, Dushyant Kumar Singh (Motilal Nehru National Institute of Technology Allahabad)

Gesture recognition is one of the most challenging area of research in computer vision. The interface for human computer interaction can easily be created using the gesture recognition. This paper suggests a novel as well as robust approach of dynamic hand gesture recognition for the human machine interaction system. Here, the system is designed to work in real time with images captured through web camera during experimentation. In RGB and HSV color space, skin color modeling is done for segmenting geometrical approximation of hand using contours. The region of interest (ROI) is used to locate the hand within the image. Fingers are counted using the contour defects and centroid tracking is used to track the hand over the sequence of frames. In experiments, the eight types of dynamic hand gestures are performed by user and these gestures are successfully recognized by the system. This proposed methodology is functioning admirably in term of recognition accuracy up to 95% for dynamic hand gesture recognition.

Keywords—Human Machine Interaction (HMI), skin colour segmentation, hand detection, gestures, gesture recognition

31. PSNet: Parametric Sigmoid Norm Based CNN for Face Recognition [Paper ID- 135]

Yash Srivastava, Vaishnav Murli and Shiv Ram Dubey (Indian Institute of Information Technology, Sri City, Chittoor)

The Convolutional Neural Networks (CNN) have become very popular recently due to its outstanding performance in various computer vision applications. It is also used over widely studied face recognition problem. However, the existing layers of CNN are unable to cope with the problem of hard examples which generally produce lower class scores. Thus, the existing methods become biased towards the easy examples. In this paper, we resolve this problem by incorporating a Parametric Sigmoid Norm (PSN) layer just before the final fully-connected layer. We propose a PSNet CNN model by using the PSN layer. The PSN layer facilitates high gradient flow for harder examples as compared to easy examples. Thus, it forces the network to learn the visual characteristics of hard examples. We conduct the face recognition experiments to test the performance of PSN layer. The suitability of the PSN layer with different loss functions is also experimented. The widely used Labeled Faces in the Wild (LFW) and YouTube Faces (YTF) datasets are used in the experiments. The experimental results confirm the relevance of the proposed PSN layer.

Keywords—Face Recognition, Deep Learning, Sigmoid Function, Parametric Sigmoid Layer, PSNet.

32. Automated Helmet Detection for Multiple Motorcycle Riders using CNN. [Paper ID- 151]

Madhuchhanda Dasgupta, Oishila Bandyopadhyay and Sanjay Chatterji (Indian Institute of Information Technology Kalyani)

Automated detection of traffic rule violators is an essential component of any smart traffic system. In a country like India with high density of population in all big cities, motorcycle is one of the main modes of transport. It is observed that most of the motorcyclists avoid the use of helmet within the city or even in highways. According to road safety survey reports, use of helmet can reduce the risk of head and severe brain injury of the motorcyclist for more than 60% motorcycle accident cases. Today violation of most of the traffic and safety rules are detected by analysing the traffic videos captured by surveillance camera. This paper proposes a framework for detection of single or multiple riders travel on a motorcycle without wearing helmets. In the proposed approach, at first stage, motorcycle riders are detected using YOLOv3 model which is an incremental version of YOLO model, the state-of- the-art method for object detection. In the second stage, a Convolutional Neural Network (CNN) based architecture has been proposed for helmet detection of motorcycle riders. The proposed model is evaluated on traffic videos and the obtained results are promising in comparison with other CNN based approaches.

Keywords- YOLOv3, Convolutional Neural Network, Object Detection, Helmet Detection

33. An Enhanced Criterion for Induced H inf. Stability of Discrete-time Systems with Time-varying Delay and External Disturbance. [Paper ID- 158]

Kalpana Singh, Dinesh Chaurasia and V. Krishna Rao Kandanvli (Motilal Nehru National Institute of Technology, Allahabad)

This paper presents an enhanced approach for induced H stability of discrete-time systems with external disturbance and time-varying delay. The presented approach considers a suitable Lyapunov function and its forward difference is estimated using Jensen inequality, leads to a less conservative result. Delay-partitioning method is introduced for partitioning the delay interval into subintervals. A comparison of the presented criteria with the existing criterion is shown. The effectiveness of the presented criteria is illustrated with the use of an example.

Keywords— H performance analysis, discrete-time system, Jensen inequality, delay-partitioning method, timevarying delay

34. Fusion of Heterogeneous Range Sensors Dataset for High Fidelity Surface Generation. [Paper ID- 162]

Mahesh K Singh (National Institute of Technology Delhi)

Due to the need for higher quality depth data than possible with an individual range sensing approach nowadays, there has been a growing interest to develop an integrated depth sensing technique by fusion of different 3D acquisition approaches that are more precise than the individual devices. In this paper, a new unsupervised range data fusion method using distinct range sensors has been presented for the extraction of an accurate surface model. In the fusion method, the analysis of Kinect's depth data based on Haar wavelets is used to identify regions requiring finer scan by the Laser range sensor. The fused data illustrate the more accurate descriptive characteristic of the surface. The experimental results show a high quality reconstructed 3D model which validates the correctness of the real surfaces.

Keywords--Active Range Sensors, Unsupervised segmentation, Haar Wavelets, Data Fusion, Surface Reconstruction.

35. An Observer based FLL to Estimate the Grid Parameters of Three Phase Systems. [Paper ID- 166]

Arthi R., Arun K and Selvajyothi K (IIITDM Kancheepuram)

Grid synchronization is a crucial task for maintaining proper and stable operation of the power system networks. It requires a less complex and fast estimating frequency locked loop (FLL) which can manage the grid aberrations like nonlinearity, glitches and unbalances. To achieve this, a systematic measurement of the key parameters of all the three phases under various disturbances is required. In this paper, a discrete observer based FLL is proposed to estimate the magnitude, frequency and phase of a three phase system. The proposed observer based FLL has been tested through simulations for various three phase faults and disturbances. The results show that the proposed method is very much suitable for grid synchronization because of its simple structure, estimation capability in terms

of response time and accuracy.

36. LEDCOM: A Novel and Efficient LED Based Communication for Precision Agriculture. [Paper ID- 140]

K V Sai Vineeth, Raja Vara Prasad and Shiv Ram Dubey (Indian Institute of Information Technology, Sri City, Chittoor)

Wireless Sensor Networks and Satellite Remote Sensing are some of the existing techniques that are used to collect, analyze and interpret data from the agricultural crop sites. However, there are certain limitations common to both of these techniques that are concerned with the latency and the resolution of the data collected. UAVs (Unmanned Aerial Vehicles) are becoming another alternative that has become integral nowadays due to its affordable and scalable nature while offering user friendly requirements and customizations. This proposes a novel and cost-effective technique (LEDCOM) that harnesses the capabilities of ground sensors and unmanned UAV while using computer vision methods to produce a qualitative data analysis system that describes the crop site under supervision. An UAV is assumed to collect the ground based sensor node data in the form of binary patterns on LED Arrays that is encoded in the image taken by a camera of a drone. Image processing techniques are used to identify and decode the LED sequences from the arrays. The performance of the proposed system is evaluated under different features and image resolutions within the same lighting conditions. A promising performance is observed for LED pattern identification from the challenging images taken from a height.

Keywords—Wireless Sensor Networks, Remote Sensing, Precision Agriculture, UAVs, Computer Vision, LED Pattern Identification

37. Stacked Filter Bank based descriptor for Human Action Recognition from Depth Sequences. [Paper ID- 074]

Shekar B H and Rathnakara Shetty P, Leonid MestetskyManju Prasad M (Mangalore University, Karnataka)

Registering the motion cues from a video to produce a compact representation is a crucial stage in video based Human Action Recognition (HAR). Exploiting the most prominent fea-tures using an efficient descriptor from such a representation also plays an equally significant role in the performance of recognition models. In this work, we present a concise Depth Motion Map with striding which registers the motion cues from depth sequences on a video and a novel Filter Bank based descriptor, wherein a Taylor Series Expansion (TSE) filter, a Riesz filter anda gradient filter are stacked together to extract the prominent features. We empirically evaluate the feasibility of our methodon MSR Action 3D dataset under standard protocols, achieving state-of-the-art results.

Keywords—Depth Maps, Filter Bank Descriptor, Stridden Depth Motion Map.

38. Optimizing Driver Assistance Systems for Real-Time performance on Resource Constrained GPUs [Paper ID- 046]

Ojas Ramwala, Dr. Chirag N. Paunwala and Mita Paunwala (NIT,Surat)

The importance of Advanced Driver Assistance Systems has increased tremendously due to their ability to reduce road fatalities by facilitating drivers for appropriate action selection in circumstances involving high probability of collisions. One of the major factors contributing to accidents on road is driver distraction and drowsiness. A variety of algorithms including several Forward Collision Warning algorithms have been proposed to alleviate the issue to road accidents. These algorithms are promising approaches to mitigate this problem. However, a majority of these proposals are computationally complex algorithms and require powerful GPUs to perform in real-time. Such GPUs are not only expensive but also have high power consumption. Thus, it is necessary to yield real time performance on resource constrained GPUs like NVIDIA's Jetson TX2 which is not only one of the most eminent GPU-enabled platforms for autonomous systems but also cost effective and power efficient [1]. This paper proposes utilization of pruning of Neural Networks and TensorFlow TensorRT to optimize computationally complex algorithms utilized for Driver Assistance Systems to obtain real-time functionality on TX2 without compromising the accuracy of the system.

Keywords— Advanced Driver Assistance Systems, Forward Collision Warning, resource constrained GPUs, TensorFlow TensorRT

TS-6 (NIS)

[11:45AM - 01:30PM, Room No: 5006]

39. Certificate-less Public Key Encryption For Secure e-Healthcare Systems. [Paper ID- 035]

Srikar Paida, Mayank K. Aditia, Fahiem Altaf and Soumyadev Maity (PDPM, Indian Institute of Information Technology, Design and Manufacturing, Jabalpur)

Any data that is shared in a public network, if private, is supposed to be secured to prevent any unauthorized users. E-healthcare systems have the health status of patients, which are one such kind of data that need to be secured. With the development of e-healthcare systems, users have increased by a large number, which by the way results in the need for the security of those. To prevent illicit activities (like data being accessed by unauthorized users), we propose a secure data sharing scheme which uses Certificate-less Public Key Encryption and signature for the confidentiality along with privacy of the health data. We proposed this efficient and secure scheme of data transfer for the patients' health data to provide the privacy required and also to avoid unauthorized users from accessing the data.

Keywords-e-Healthcare, Certificate-less Public Key En- cryption, Bilinear Pairing, Key escrow

40. SHEMB: A secure approach for healthcare management system using blockchain. [Paper ID- 038]

Nitish Andola, Raghav Gahlot, Sourabh Prakash, Venkatesan Subramanian and Shekhar Verma (Indian Institute of Information Technology, Allahabad)

Medical records need to be private. At the same time, it must be accessible for regular interaction authorized users. Ethereum-based blockchain allows privacy preserving sharing of decentralized databases with cryptographic data obfuscation and access control. In this work, we analyze the limitations of Ethereum-based blockchain with respect to elec- tronic health record (EHR) sharing through a third party. A Ethereum framework for decentralized and transactional privacy preserving data sharing is proposed to address the needs of different stakeholders like patients, providers and other third involved in the generation and access of patient data records. The secure health management system using blockchain (SHEMB) obviates the need for a trusted third party for storing data. SHEMB uses symmetric searchable encryption technique to speedup the access to the records using the search query provided by the patient. The experimental results indicates the practical and secure nature of SHEMB.

Keywords—Blockchain, Healthcare, Symmetric Searchable Encryption, Security

41. Investigations on Equal Cost Multi Path Feature in Dynamic Routing Protocols in IPv6 Networks. [Paper ID- 073]

Shailendra Tomar, Anil Rawat, Prakash D Vyavahare and Sanjiv Tokekar (Raja Ramanna Center for Advanced Technology)

Worldwide, organizations are gearing up to implement IPv6 in their networks. The main concern of the network architects is the selection of interior gateway dynamic routing protocol for ensuring the best Quality of Service (QoS)support to the users. The available options are RIPng, OSPFv3,EIGRP, and IS-IS. Intelligent routing of packets over multiple paths is performed by ISPs to satisfy guaranteed Service LevelAgreement (SLA) imposed network uptimes and QoS. All these protocols support the Equal Cost Multi-Path (ECMP) feature for achieving these objectives. With the ECMP feature providing re-routing in case of link/node failures in multiple path cases, it is worth to investigate its coupling with dynamic routing protocols. Past research work was focused on carrying out performance analysis of the dynamic routing protocols based on QoS and convergence metrics of simple IPv6 networks. In this paper, we present the performance analysis of the IS-ISand OSPFv3 protocols, specifically probing the performance of the ECMP feature in IPv6 networks. 02, 04 and 08 numbers of equal-cost paths between source and destination, are investigated for QoS parameters, using the OPNET simulator. We conclude that IS-IS is the best among the two, supportingECMP in IPv6 networks with less than 1%, 27%, 43% packet loss ratios in 02, 04, 08 path networks respectively as compared to 7%, 40%, 55% respectively in ECMP coupled with OSPFv3routing protocol for video traffic, with similar trends for voicetraffic, in the discussed scenarios.

Keywords—IPv6, QoS, OSPFv3, IS-IS, ECMP, Fast Rerouting

42. Tamper-Proof Certificate Management System [Paper ID- 075]

Raghav Gahlot, Nitish Andola, S. Venkatesan and Shekhar Verma (Indian Institute of Information Technology, Allahabad)

Certificates are a proof of achievement/membership like University degrees and school certificates etc. Certificates as a proof are essential in the society but our current certificate management system is mostly analog, inefficient and amenable to forgery. Due to the ineffective anti-forge mechanism, forged certificates are becoming prevalent. To solve this problem, many certificate systems are introduced, even though security issues like privacy, transparency and forgeries still exist. We propose a tamper-proof certificate management using hyperledger which provides secure anti-forge mechanism. Hyperledger has unmodifiability and other suitable properties of the blockchain that helps to minimize the problem of forgery. We use IPFS (InterPlanetary File System) for storing the certificate. The procedure for issuing the certificates is to first generate the degree of a student using portal, meanwhile then calculate its hash value and encrypt it using asymmetric encryption. Then store file into IPFS. Finally, we make a transaction that contains metadata of certificate which stores in the blockchain system. Then, chain code used for verification of user's document. we also reduce the time complexity of searching and verifying the multiple of document of a same user. Our proposed work enhances the credibility of paper-based certificates, and also reduces the risk of forging certificates. We also show the performance of generating transactions in hyperledger.

Keywords—Hyperledger, Certificate, Hashing, IPFS, Chain-code.

43. Decentralized and Distributed System for Organ/Tissue Donation and Transplantation. [Paper ID- 082]

Pratyush Ranjan, Shubhanker Srivastava, Vidit Gupta, Shashikala Tapaswi and Neetesh Kumar (ABVP Indian Institute of Information Technology and Management, Gwalior)

In today's era of digitisation, many technologies have evolved that every manual work can be digitally automatized. In the digital automatizing process, security and privacy are the most important and highly demanding aspects. Blockchain offers many features that can be used in almost every sphere of life. Features like decentralisation, transparency, privacy makes it an extremely useful technology. Therefore, by making use of all these features, several problems in healthcare sector can be solved like removing complex network of third parties and lack of traceability of transactions. This paper presents a decentralised, secure and transparent organ and tissue transplant web application (also called DApp), which not only nullifies the role of any third party involved in the organ transplantation, but also is a cost effective solution that saves the patient from high cost of transplantation. The details and Electronic Medical Record (EMR) are hashed using the IPFS(a distributed file server), which reduces the cost of upload to a great extent as shown in the results section of this paper

Keywords—Blockchain, Healthcare, Transparent, Secure, Decentralised, Organ Donation, IPFS

44. Vulnerability Discovery Modelling With Vulnerability Severity. [Paper ID- 108]

Ankur Shukla, Basel Katt and Livinus Obiora Nweke (Norwegian University of Science and Technology, Gjøvik)

Web browsers are primary targets of attacks be- cause of their extensive uses and the fact that they interact with sensitive data. Vulnerabilities present in a web browser can pose serious risk to millions of users. Thus, it is pertinent to address these vulnerabilities to provide adequate protection for personally identifiable information. Research done in the past has showed that few vulnerability discovery models (VDMs) highlight the characterization of vulnerability discovery process. In these models, severity which is one of the most crucial properties has not been considered. Vulnerabilities can be categorized into different levels based on their severity. The discovery process of each kind of vulnerabilities is different from the other. Hence, it is essential to incorporate the severity of the vulnerabilities gresent in the software quantitatively with consideration for the severity of the vulnerabilities. It is possible to apply the proposed model to approximate the number of vulnerabilities along with vulnerability discovery rate, future occurrence of vulnerabilities, risk analysis, etc. Vulnerability data obtained from one of the major web browsers (Google Chrome) is deployed to examine goodness-of-fit and predictive capability of the proposed model. Experimental results justify the fact that the model proposed herein can estimate the required information better than the existing VDMs.

Keywords—Vulnerabilities, Vulnerability discovery model, Severity, Web browser

45. A new method of multicolor image encryption. [Paper ID- 141]

Anand Joshi and Dhanesh Kumar (University of Lucknow)

A new method of multi color image encryption based on fractional discrete Fourier transform (FrDFT) and 3D Arnold chaotic map (ACM) is proposed in this paper. In this method first three color images are converted into Bayer color images then these Bayer images are taken as red, green and blue components of a true color image. These three Bayer images are horizontally combined into a single complex image matrix then half of the part of this single matrix is considered as real part and other half part is considered as imaginary part and apply 2D FrDFT. After applying 2D FrDFT separate the image matrix into three components and apply 3D ACM on each of these components and combining these three components we get encrypted image. Decryption of the proposed method is same as encryption but in reverse order. Experimental result are done with various images. Key space, key sensitivity analysis are done for the proposed method. Entropy, histogram, MSE, PSNR, and correlation analysis are given. These analysis and experimental results shows that our method is a strong enough against these statistical attacks.

Keywords— Image encryption, Multi image, Arnold cat map, Fractional discrete Fourier transform

46. Divisible Load Scheduling from Single Source in Distributed Heterogeneous Environments [Paper ID- 152]

Murugesan G and Sherin K (St. Joseph's College of Engineering)

This work produces one of the solution for scheduling divisible loads. Divisible loads are computing loads that can be partitioned in to number of fractional loads in arbitrary size and can be processed independently. Scheduling such type of loads in distributed heterogeneous environment is a challenging task. The aim of this proposed work is to find out the size of the fractional load to be assigned to the childprocessor by the root processor in a tree shaped network, so that the computational or processing time of the entire load could be minimized. In this work, to find the size of the fractional load, a mathematical model was developed with an objective of minimizing the finish time with the fulfillment of the given budget and deadline to process the load. The proposed model has been solved with sample values specified in the literatures with few assumptions. Experimental result shows that the proposed approach produces a better result compare with the existing approach described in the literature with the same assumptions.

Keywords—Divisible load scheduling, linear programming, Resource allocation, Task scheduling, Single source scheduling

47. REHR: Residual Energy based Hybrid Routing Protocol for Wireless Sensor Networks. [Paper ID- 167]

Akhilesh Panchal and Rajat Singh (IIIT-Allahabad)

Wireless Sensor Network (WSN) have been used in Internet of Thing (IoT) applications, where sensing of information is prime object. WSN consisting of large number of nodes that are randomly deployed, these nodes are collecting important infor- mation from the target area, and also transmit its information to the respective destination. Efficient utilization of node's energy is the most fundamental challenge of WSN, and primarily depends on the packet routing strategy. In this paper, we are proposing a Residual Energy based Hybrid Routing (REHR) protocol, in- which direct nodes and clustering-phase are hybridly used for efficient packet transmission. Here, packet routing strategy uses single-hop and multi-hop communication, which is based on the residual energy of the nodes. This technique gives the optimal usage of node's energy and also reduces the load of the CHs. We have shown that the our proposed work is better in terms of lifetime, residual energy and packet transmission of the network.

Keywords—Wireless sensor networks, routing, energy con- sumption and network lifetime

48. Stacking Based approach for prediction of faulty modules. [Paper ID- 109]

Pradeep Singh (National Institute of Technology, Raipur)

Determination of a software module, prone to fault is important before the defects are discovered; because it can be used for better prioritization of resources. Software fault prediction is one of such task that predicts the fault proneness of the developed modules by applying machine learning techniques on software defect data. State-of-art software defect prediction techniques suffer from achieving good accuracy due to imbalanced nature of software defect datasets. To address this issue, here we present an approach for software defect prediction by combining imbalance removal and ensemble- model. As ensemble approach is very effective and provides better prediction

results as compared to the individual techniques. Stacking-based framework is developed by considering the outperforming ensemble classifiers in order to predict the faulty software modules. All the experiments are performed over twelve benchmark NASA MDP datasets. The paper presents an improved ensemble-based stacking approach to classify the fault prediction for the software system in an effective way.

Keywords— Software fault prediction, Ensemble method, Stacking, Classification

49. Power Attack on VHDL Implementation of Continuously Running Block Ciphers. [Paper ID- 181]

Arvind Singh and S. P. Mishra (SAG, DRDO, DELHI)

The Correlation Power Analysis (CPA) is used to compromise the security of crypto systems by measuring and analyzing physical leakage that is the power consumption. Unlike classical cryptanalysis techniques, it requires very less computations to extract the secret information of the cipher systems. But, one of the main hindrances in mounting the CPA attack is the segregation of single power trace of multiple encryptions performed continuously (without pause) among number of traces corresponding to individual encryptions. To overcome this limitation, a new technique is proposed in this paper to split the power traces of AES and DES algorithms running continuously on FPGA. This (energy of samples based algorithm) finds the start of the encryption and computes number of samples in each clock of FPGA. It exploits the repetition of specific patterns available in the traces to determine the encryption length in terms of number of traces corresponding to each encryption. The important thing is that it does not require information about clock frequency of FPGA board and sampling rate of the oscilloscope. This algorithm was applied on the traces of 25, 50, 100, 125 and 250 samples per clock (when processing was performed at 1, 2 & 4 MHz clock frequencies). In all the cases, the key of AES and DES were retrieved by mounting the CPA attack on splitted traces resulting from the splitting technique.

TS-7 (CTS)

[04:45PM - 06:15PM, Room No: 5006]

50. Performance analysis of MIMO-NOMA-Based Indoor Visible Light Communication in Single Reflection Environment. [Paper ID- 014]

Anoop Kumar Mishra and Aditya Trivedi (ABV-IIITM, Gwalior)

This paper examines the performance of multiple-input-multiple-output (MIMO) non-orthogonal multiple access (NOMA) based indoor visible light communication (VLC) in a single-reflection environment. The VLC system is equipped with two light-emitting diodes (LEDs) transmitter and multi-user receiver, and each user consists of two photodiodes (PDs) working as a NOMA pair. In this paper, a single reflection scenario is considered, and the corresponding delay spread is calculated which is the function of room dimensions. The proposed approach uses two efficient power allocation methods namely normalized gain difference power allocation (NGDPA) and gain ratio power allocation (GRPA). Later, the measurable data rate and channel delay spread in MIMO with NOMA based VLC system is investigated using these methods. The result shows that NGDPA with NOMA has a percentage gain of sum rate up to 18.22 as compared to GRPA with NOMA. Furthermore, the numerical values of maximum channel delay spread are 10.89 ns and 11.14 ns in GRPA and NGDPA, respectively for two users.

Keywords—MIMO, NOMA, VLC, normalized gain difference power allocation, gain ratio power allocation.

51. FIR Filter Realization Under the Trade-Off Between Implementation Complexity and Computation Rate [Paper ID- 065]

Abhishek Kumar and Suneel Yadav (Indian Institute of Information Technology Allahabad)

We propose a flexible finite impulse response (FIR) filter structure which can avail the benefits of trade-off between computation units and clock rate. For designing such flexible FIR filter, we first present two supporting structures viz., Structure I and Structure II. Structure I realizes the FIR filter via single multiplier, single adder, and N delays, where all units operate at the rate of N f in (i.e., high clock rate), and N and f in denote the order of FIR filter and input sampling frequency, respectively, whereas Structure II implements the FIR filter using N M multipliers, M N

- M 2 adders, and M N - M 2 delays in in the filter unit with clock rate f M (i.e., computationally low- speed realization), and M - 1 adders and delays at the output unit operate at f in , where $2 \le M \le N$ and M denotes the upsampler/downsampler. Then, we propose Structure III via Structures I & II, which provides the flexible realization of FIR filters under the trade-off between computational units and clock rate. We also analyze the performance of these structures in terms of number of multipliers (C M), number of adders (C A), number of delays (C D), and operating frequency (F opt) with the help of numerical example in comparison of the direct form FIR filter

52. Physical Layer Security in Intervehicular Cognitive Relaying Communication Systems. [Paper ID- 067]

Anshul Pandey and Suneel Yadav (Indian Institute of Information Technology Allahabad)

This paper investigates the secrecy performance of an intervehicular cognitive relaying network. We assume that the primary receiver (PU) in the primary network is fixed, whereas the secondary source, secondary relay, secondary destination, an eavesdropper are moving vehicles. Considering such scenario, the channel between fixed node and vehicle node is modeled as Rayleigh fading, while the vehicle-to-vehicle channels are modeled as double-Rayleigh fading. In order to analyze the impact of eavesdropper channel and maximum tolerable interference level at PU, we firstly derive the tight closed-form expression of the secrecy outage probability (SOP) for the considered system. Moreover, to extract further insights, the asymptotic SOP expression in the high signal-to-noise ratio (SNR) regime is also deduced, which reveals that the eavesdropper has detrimental effect on the system secrecy performance and even reduces the system secrecy diversity order to zero. Lastly, we validate our analytical finding via simulations.

53. Thinning of Concentric Circular Antenna Array Using Binary Salp Swarm Algorithm [Paper ID- 095] Amiya Kumar Mondal and Prerna Saxena

(Indian Institute of Information Technology Design & Manufacturing Kancheepuram)

Antenna array synthesis with the least possible number of elements for obtaining the desired radiation pattern is important in some applications, for example, satellite commu- nication, where the weight of antennas is limited. The objective of this paper is thinning of Concentric Circular Antenna Arrays (CCAA) to achieve a reduction in weight and cost. In this paper, swarm intelligence technique, Binary Salp Swarm Algorithm (BSSA) is introduced for synthesis of thinned CCAA. Thinning of antenna array requires the expulsion of a few antennas in the stretch of antennas so as to attain similar radiation characteristics as that of a densely occupied array. The BSSA approach is proposed to synthesize a CCAA to decrease the maximum side lobe level (MSLL), simultaneously by maintaining the percentage of thinning equivalent or higher than 50%. A CCAA with 440 antennas is optimized by the BSSA approach and is compared with other state-of-the-art approaches to demonstrate its efficacy.

Keywords— Concentric circular antenna array, optimization technique, binary salp swarm algorithm, thinning, maximum side lobe level reduction.

54. Performance Evaluation of Non-orthogonal Multiple Access in V2V communications Over Double- Rayleigh Fading Channels. [Paper ID- 102]

Neha Jaiswal and Neetesh Purohit (Indian Institute of Information Technology Allahabad)

In this paper, we investigate the performance of a downlink power-domain non-orthogonal multiple access (NOMA) system, wherein a base station (BS)/access point (AP) intends to communicate with the two users (i.e., UE1 and UE2) simultaneously in the same frequency band. Such concurrent transmission is made feasible by exploiting the power-domain approach, in which the near user is allocated less power while the far user is allocated relatively more power. By considering the BS/AP, UE1, and UE2 as moving vehicles, we model the vehicle-to-vehicle (V2V) channels between BS/AP and UE1 and between BS/AP and UE2 as double-Rayleigh fading. Under such channel modelling, we evaluate the individual outage probability of the users, overall outage probability, and system throughput expressions of the considered system. We verify our analytical and theoretical studies with the help of simulations. A comparison between our considered system and conventional orthogonal multiple access (OMA) system in terms of system throughput is also presented in this paper.

55. UWB Monopole Antenna with Triple-Band Notch Rejection [Paper ID- 147]

Abhishek Patel and Manoj Singh Parihar (PDPM IIITDM Jabalpur, Madhya Pradesh)

A compact monopole with multiple band notches filtering antenna is analyzed in this paper. The monopole antenna

includes a rectangular patch which covers the ultra-wideband (UWB) frequency range from 3.1GHz to 10.6GHz. Further to reject the interfering licensed frequency bands like WiMAX, wireless local area network (WLAN) and X-Band, $\lambda g/2$ resonators are used. The rectangular split ring resonator within monopole radiator is used to create band notch at 3.5GHz (WiMAX) and E shaped dual notch resonator for notch bands at 5.8GHz (WLAN) and 8.4GHz (X-Band). The proposed prototype is designed and simulated in commercially available software known as CST Microwave Studio. Simulated results are showing the performance of proposed filtering antenna as desired.

Keywords— Antenna, monopole, notch, UWB

56. Tuning Of Passbands In Compact Substrate Integrated Waveguide Bandpass Filter Using Perturbation Slot [Paper ID- 163]

Soumit Chaudhury, Seema Awasthi and Rajat Singh (Indian Institute of Information Technology Allahabad)

A technique of tuning the center frequency and bandwidth of dual passbands using circular arc perturbation slot in compact substrate integrated waveguide (SIW) filter is presented in this paper. A compact SIW filter is derived from circular SIW cavity and perturbation slot is introduced to disturb the excited modes. After rightly placing the slot, the arc angle is adjusted to change the surface current path of the excited modes and control the frequency of resonance and passband bandwidth. 1st passband center frequency (CF) can be tuned within a range of 1.23 GHz while 2 nd passband remains almost unchanged when the slot is placed 12 mm away from cavity center. If the slot is placed 8 mm away from the cavity center, 1 GHz shift in CF and 1.2 GHz change in 3dB BW of 2nd passband is attained keeping 1 st passband undisturbed. Minimum insertion losses of passbands during the process of tuning are maintained within 1.2dB.

Keywords—substrate integrated waveguide (SIW), resonating modes, perturbation slot, tuning.

TS-8 (CPCI+RAI)

[04:45PM - 06:15PM, Room No: 5007]

57. Cyber Risk Assessment of Networked Cyber Assets using Probabilistic Model Checking [Paper ID- 069]

Anand Handa, Subhasis Mukhopadhyay, Shankhadip Mallick, Nitesh Kumar, Sandeep K. Shukla, Remish L. Minz, Sanjana Pai Nagarmat and Ramesh Rakesh (C3I Center, Indian Institute of Technology, Kanpur, India)

Attack path analysis to assess the path from the external facing entities to the inner hosts and network elements is a much researched problem. However, to compute a summary risk value per device, based on vulnerabilities discovered on a daily basis, is a much demanded capability in the arsenal of any security administrator of an enterprise network. Further, higher management such as CISOs have to be convinced with numerical risk comparisons to allow the down time required to patch the systems as opposed to defer it till a much later date during a scheduled shutdown. It must be noted that each security administrator's problem is different due to the difference in the structure and composition of the network they administer. Therefore, no industry data source can help in getting these numbers, as the risk numbers are specific to each network and its components. In this paper, we present a methodology based on probabilistic model checking to compute these risk scores for each device in an enterprise network.

Keywords—Network Security, Exploit Path Graph, FormalVerification, Model Checking, Security Vulnerability.

58. Secure and Privacy Focused Electronic Health Record Management System using Permissioned Blockchain. [Paper ID- 076]

Vinay Mahore, Priyanshi Aggarwal, Nitish Andola, Raghav Gahlot and S. Venkatesan (Indian Institute of Information Technology, Allahabad)

Blockchain has tremendous potential for use in various industries, including health care. It provides an im-mutable, shared and transparent history of all the transactions to build the applications with trust and accountability. It helps in simplifying pharmaceutical supply chains, aiding researchers in drug development by making patients' data more secure and accessible. Health care researchers today struggle with delayed communications, scattered data and delayed medical workflows caused by conflicting eHealth care systems which makes it difficult to provide

personalized care. The main problem is alack of trust between these independent eHealth care system which makes it difficult to establish an end-to-end accessible network. Blockchain, due to its properties, can be a potential solution to provide this link. We propose a model which focuses on providing healthcare data to researchers for statistical analysis and providing privacy at the same time. The model exhibits highdata security by aggregating the customized access control protocol and asymmetric cryptography. It uses proxy re-encryption technique for sensitive medical information sharing.

Keywords—Blockchain, privacy, security, interoperability, eHealth care

59. Decentralized Patient Centric e-Health Record Management System using Blockchain. [Paper ID- 092]

Gaganjeet Reen, Manasi Mohandas and Venkatesan S (Indian Institute of Information Technology, Allahabad)

Electronic Health Records (EHR) are gaining a lot of popularity all over the world. The current EHR systems however have their fair share of problems related to privacy and security. We have proposed a mechanism which provides a solution to most of these problems. Using a permissioned Ethereum blockchain allows the hospitals and patients across the world to be connected to each other. Our mechanism uses a combination of symmetric and asymmetric key cryptography to ensure the secure storage and selective access of records. It Gives patients full control over their health records and also allows them to grant or revoke a hospital's access to his/her records. We have used IPFS(inter planetary file system) to store records which has the advantage of being distributed and ensures immutability of records. The proposed model also maintains the statistics of diseases without violating the privacy of any patient.

Keywords-- Blockchain, IPFS, e-Health Records, Decentralized Storage

60. Three Phase Authentication Protocol for Smart Grid Communication. [Paper ID- 110]

Himank Goel, Ayush Gupta, Harshit Jain, Aashutosh Khandelwal, Harsh Jain, Ayush Sinha and Om Prakash Vyas (Indian Institute of Information Technology, Allahabad)

Due to the recent IT enabled development of the Smart Grid (SG) technologies, the authentication of such systems has become a key concern. In this paper, we review some of the work that has been undertaken in this area and discuss the drawbacks that these approaches lacked. We then propose a new, secure and robust authentication protocol for smart grid authen- tication. In our work, we have proposed a mathematical model for a secure communication channel involving four different entities namely Trusted Authority, Sub-station, Smart Meter and the User. We have also performed a security analysis to demonstrate the ability of our protocol to resist various well-known attacks. In our proposed work, the security of the protocol is built on the hardness of Elliptic Curve Discrete Logarithm Problem (ECDLP), encryption and hashing algorithms. Therefore, it is safe against several cyber-security attacks.

Keywords—smart grid, three-factor-authentication, ECDLP

61. Cyber-Physical Interdependencies in Power Plant Systems: A Review of Cyber Security Risks [Paper ID- 111]

Aida Akbarzadeh, Pankaj Pandey and Sokratis Katsikas (Norwegian University of Science and Technology)

Realizing the importance of the concept of -smart cityl and its impact on the quality of life, many infrastructures, such as power plants, began their digital transformation process by leveraging modern computing and advanced communication technologies. Unfortunately, by increasing the number of connections, power plants become more and more vulnerable and also an attractive target for cyber-physical attacks. The analysis of interdependencies among system components reveals interdependent connections, and facilitates the identification of those among them that are in need of special protection. In this paper, we review the recent literature which utilizes graph-based models and network-based models to study these interdependencies. A comprehensive overview, based on the mainfeatures of the systems including communication direction, control parameters, research target, scalability, security and safety, is presented. We also assess the computational complexity associated with the approaches presented in the reviewed papers, and we use this metric to assess the scalability of the approaches.

Keywords— Cyber-physical systems, cyber-physical interdependencies, critical infrastructure, smart grid

62. Developing a Bayesian Network Framework for Root Cause Analysis of Observable Problems in Cyber- Physical Systems. [Paper ID- 112]

Sabarathinam Chockalingam and Vikash Katta (Institute for Energy Technology)

Because critical infrastructures rely on Cyber-Physical Systems (CPSs), appropriate response to problems in such infrastructures operated by CPSs is important. Firstly, it is essential for decision-makers to be able to determine whether the observed problem is due to an attack or technical failure. In previous work, we developed a framework for building Bayesian Network (BN) models to enable decision-makers to determine whether the observed problem is due to an attack or technical failure. In previous work, we developed a framework for building Bayesian Network (BN) models to enable decision-makers to determine whether the observed problem is due to an attack or technical failure. However, this information alone is not adequate to choose effective response strategies for the observed problem. It is also essential for the decision- makers to be able to determine the most likely attack vector used to cause the observed problem or failure mode caused the observed problem to choose effective response strategies. However, the decision support to determine the most likely root cause for an observed problem is missing. In this paper, we develop a framework for building BN models to enable decision- makers to determine the most likely root cause of problems. We demonstrate the developed framework using an example problem in smart grids.

Keywords — Bayesian network, Root cause, Safety, Security

63. An Unsupervised Neural Network Approach For Inverse Kinematics Solution Of Manipulator Following Kalman Filter Based Trajectory [Paper ID- 084]

Gaurav Bhardwaj, N. Sukavanam, Ruchi Panwar and R. Balasubramanian (IIT Roorkee)

A novel unsupervised approach for inverse kine-matics solution of a manipulator using artificial neural networks presented. Forward kinematics equations determine the motion of manipulator's arm and have a unique solution. But there is not a unique solution for inverse kinematics manipulator may have more than one configurations to reach a particular point. Here in this paper, we have taken a PUMA560 robot with six degrees of freedom with aim to grab an object moving in circular path in XY plane with a known constant height and kalman filter has been used to determine accurate position of that object. Contrary to supervised learning approach, which needs a huge amount of data to train the system, we have used a real time unsupervised approach to solve the inverse kinematics problem which is more efficient. Joint angles of the robot are determined in real time using unsupervised feed forward neural network with backpropagation training algorithm.

Keywords: Inverse Kinematics, Unsupervised, Manipulator, Artificial Neural Network, Kalman Filter, PUMA 560

Abstract of presentations on 8th December 2019

TS-9 (CBD + CS)

[10:45 AM-11:30 AM Room 5054]

64. Flash Translation Layer And Its Functionalities [Paper ID- 39]

Shweta and Pradeep Kumar Singh (Madan Mohan Malviya University Of Technology)

Flash memory had gained popularity as secondary storage when compared to hard disk it poses excellent factors like as light weighted, shock resistance, non volatility in nature and low power consumption. However there are some technical limitations such as read and write operation cost differs in context of energy and time. To write any data, first that page should be erased which leads to another level of complexity as read/write operation works on granularity of page and erase operation is performed on granularity of block which is collection of pages. Despite the fact that flash memory is replacing traditional hard disk it urge some computational overhead which make this replacement difficult .To sort out the differences in interface an emulation layer FTL (Flash Translation Layer) is used. FTL mapped the host generated logical address to physical address of flash memory. This paper surveys the functionalities of FTL.

Keywords— Address Translation, Sector Mapping, Block Mapping, Hybrid Mapping, Wear-Leveling, Garbage Collection.

65. Towards Comparison Of Real Time Stream Processing Engines [Paper ID- 53]

Devesh Kumar Lal and Ugrasen Suman (SCSIT DAVV)

The real time stream processing engines are developed for different specific use cases, which incorporates various domains such as, IOT, finance, advertisement, telecommunications, healthcare etc. These stream processing engines are based on distributed processing models, where unbounded data streams are processed. Semantics of data stream is determined after complete scanning of whole data sets, which becomes inconvenient in real time stream processing to process entire data stream at once. Windowing mechanisms are used for processing data stream in a predefine topology with fixed number of operations such as, join, aggregate, filter etc. In this paper, a comparative study is performed with existing stream processing engines. This comparison provides a direction for choosing an appropriate stream processing engine. A modified master-slave model for stream processing is discussed for reducing latency, improving scalability and fault tolerance.

Keywords— Data processing, real time big data, real time data processing, stream processing engines

66. Noise Analysis of Quantum Approximate Optimization Algorithm on Weighted MAX-CUT [Paper ID- 99]

Lakshya Priyadarshi and Utkarsh Azad (Institute of Engineering and Technology, Lucknow)

In this paper, we describe the simulation of Ising minimization on a classical machine by executing variational quantum algorithms on our density-matrix simulator. We outline the Ising formulation of the Graph Partitioning problem and the Hamiltonian Cycle problem, and solve the Max-Cut variant of graph partitioning for a weighted square graph Sq 2 using the Quantum Approximate Optimization Algorithm. We finally study the effect of errors present in Noisy Intermediate-Scale Quantum processors on the obtained solutions. This paper illustrates the approach to approximately solving hard combinatorial optimization problems using a hybrid quantum-classical scheme and describes the issues in hardware implementation of such schemes. The simulations of NISQ noise models will be useful in understanding the performance and capabilities of such approaches.

Keywords-Non-deterministic Polynomial, Ising Model, Combinatorial Optimization, Variational Quantum Algorithms

67. Virtual Workplaces Testing Method On Accordance With The Technical Task. [Paper ID- 154]

Nikolay Voit, Semen Bochkov and Sergey Kirillov (Ulyanovsk State Technical University)

Virtual industrial computer simulators have significant advantages in training employees. At the same time, conformity of modelled workplaces with a real workplace organized in accordance with the technological process is of great importance. Traditional methods of software checking – manual and automatic unit testing – are not always able to fully cover simulator functionality and test it as soon as possible. Virtual simulators verification method isproposed. It is based on the structural and parametric analysis. To determine level of compliance between virtual and real workplaces the method uses data from the industrial product life cycle management (PLM) system

Keywords - Virtual Reality, software verification, virtual simulator

68. Classification Of Arrhythmia Using Time-Domain Features And Support Vector Machine. [Paper ID- 101]

Mohit Dhaka and Porus Khetarpal (Bharati Vidhyapeeths College of Engineering, New Delhi)

Cardiac arrhythmia is a heart condition where the heart does not beat in a regular way. This is one of those diseases which are easy to diagnose. A doctor can detect arrhythmia by just looking at the Electrocardiogram (ECG) of the patient because it has many visual clues, which a doctor is trained to identify. All these visual clues are the time-domain feature. Hence, in this paper, an algorithm is presented which uses only time-domain features to classify between normal sinus rhythm and arrhythmia using Support Vector Machine (SVM). The paper also compares the classification results when the frequency domain features are used along with the time-domain features. The

frequency-domain features increase the computational complexity of the algorithm and make it harder to create a portable and reliable hardware device for the real- time detection and classification of arrhythmia. The proposed algorithm can be incorporated in a portable, lightweight and robust device which can detect arrhythmia in real-time. The accuracy of the algorithm is .36% on MIT-BIH arrhythmia database, which in comparison to other algorithm is an improvement.

Keywords— Learning; SVM Arrhythmia; Electrocardiogram; Machine

TS-10 (MSD)

[10:45 AM-11:30 AM Room 5007]

69. Ultra Low Power High Gain High Speed OTA [Paper ID- 87]

Samiksha Singh, Aman Singh, Akash Bahetra and Layak Yadav (Rewa Engineering College,Rewa)

In this paper, we present a push-pullInverter based fully differential operational trans-conductance amplifier (OTA) working at 1V powersupply with reduced power consumption and high speedperformance. Authors have used a modified feed-forward compensated technique to achieve high DC gainand minimum power consumption. The circuit issimulated in standard CMOS 180nm technology.Simulation results obtained are as follows: 57.87dB ofDC gain and 820 of phase margin with Unity GainBandwidth (UGB) of 4.32MHz for a capacitive load of0.01pf, a slew rate of 14.13V/µsec and settling time of93.17nsec have been achieved. The proposed designshows average power consumption of 253.3nWatt.Simulation results are same after post layout simulation. The maximum propagation delay calculated withparasitic capacitances is 65.68nsec. Along with 180nmtechnology the same OTA has been simulated on 90nmand 45nm technology and a comparative study byanalyzing performance in all three technologies havebeen presented by the authors.

Keywords- Operational trans-conductance amplifier, feed forward compensation technique, Unity Gain Bandwidth.

70. Design Automation of 5-T OTA using gm/ID Methodology. [Paper ID- 98]

Tangudu Bharat Kumar, Gaurav Kumar Sharma, Arun Kishor Johar, Deepak Gupta, Sougata Kumar Kar, and Dharmendar Boolchandani (Malaviya National Institute of Technology Jaipur)

Design of any electronic system without having analog block is impractical as the real-world signals are analog in nature. Operational transconductance amplifiers (OTA) are one of the basic building blocks analog design and its design using the square law method requires intuitive experience and a lot of time. In this paper, a formal and self-regulating method has been used to design a basic building block (OTA). This de- sign uses transconductance efficiency (g m /I D) methodology and automated through the Python environment. Automation is done without using the circuit simulators in the loop and the simulation results of the synthesized design are verified in Cadence Spectre simulator using UMC 180nm CMOS technology.

Keywords—Transconductance efficiency (g m /I D) methodology, lookup tables, OTA.

71. CSDG MOSFET Based Linear Voltage Regulator: A Mixed Signal Device Perspective. [Paper ID- 138]

Okikioluwa E. Oyedeji and Viranjay M. Srivastava (Department of Electronic Engineering, Howard College, University of KwaZulu-Natal, Durban - 4041, South Africa)

Various circuitries that make up an electronic communication system requires different voltage signal to power them, and this comes from voltage sources that are higher than the required. A voltage regulator is required to do the conversion and maintain that stable output signal. However, some system requires different voltages for its different outputs. Due to this need, the design of a voltage regulator with different voltage inputs and multiple output becomes imperative. In this research work, the Cylindrical Surrounding Double-Gate (CSDG) MOSFET has been employed to design linear voltage regulator and its efficiency has been verified. This design proves to have high efficiency, utilizes small device area, and reduces the degrading of devices due to constant system reset caused by feedback.

Keywords— CSDG MOSFET, Mixed Signal, Signal Device, Linear Regulator, Nanotechnology, Switches, VLSI.

72. A Comparison of Multi Chopper Amplifiers for Capacitive MEMS Transducer. [Paper ID- 142]

Deepak Gupta, Gaurav Sharma and Dharmendar Boolchandani (Malaviya National Institute of Technology Jaipur)

This paper reports the analysis and comparison of various multi chopper amplifier architectures that are used in capacitive MEMS transducer. The power consumption, Noise density and signal to noise ratio of the chopper amplifiers are the primary focus of this work. These architectures have been implemented in the 130nm technology and the power consumption of these architectures are less than 20μ W and input referred noise are less than $20nv/\sqrt{Hz}$. The reported bandwidths of these architectures are between DC to few KHz. The present work also reports the simulated value of CMRR and PSRR for the Dual chopper amplifier that has been implemented in 180nm technology and use the dummy based chopper for reducing the filtering requirement.

Keywords— chopper amplifier, MEMS, SNR, input referred noise

73. Electronically Tunable First Order Universal Filter based on CCDDCCTA. [Paper ID- 159]

Priyanka Singh, Vikrant Varshney, Ankur Kumar and Rajendra Kumar Nagaria (Motilal Nehru national Institute of technology Allahabad)

In this paper a new voltage mode universal filter configuration is introduced. This filter circuit configuration consists of analog block CCDDCCTA (current controlled differential difference current conveyor transconductance amplifier). To implement proposed filter single active element CCDDCCTA is employed. Only one passive component that is capacitor is used to realize transfer functions of the proposed filter. All first order filters can be determined using same circuit topology. To obtain transfer functions of filter two input voltage signals are required and output is obtained at single terminal by appropriate selection of input signals. Proposed filter is electronically tunable and tuning characteristics can be obtained with bias current of active block CCDDCCTA. Filter circuit is designed and simulated in SPECTRE simulator of CADENCE VIRTUOSO using UMC 0.18µm CMOS technology process parameters.

Keywords—Universal filter, electronic tuning, active analog block, voltage mode circuit, analog signal processing

74. Impact of Channel Doping Fluctuation and Metal Gate Work Function Variation in FD-SOI MOSFET for 5nm BOX Thickness [Paper ID- 178]

Pratosh K. Pal, Vikrant VarshneyAnkur KumarRajendra K. Nagaria, Avaneesh Kumar Dubey (M M M U T Gorakhpur)

This study presents the behavior of fully depleted silicon-on-insulator (FD-SOI) MOSFET by variation of channel doping concentration and work function of gate material. The channel doping concentration and work function of gate material are varied from 10 12 to 10 19 cm - 3 and 4.4 to 4.8eV respectively. The investigation is presented for 5nm of silicon film thickness with 2nm and 5nm thickness of gate oxide and buried oxide (BOX) respectively. The comparative study of doping variation on several performance parameters has been characterized using Visual TCAD EDA Tool. The result shows that there is very sharp rise or fall in the device parameters value at very high doping (10 19 cm - 3). The required tuning of off current is also possible with respect to these variations as the 81% sudden drop is noticed for 10 times increment in doping concentration from 10 17 cm - 3 and at work function of 4.6eV.

Keywords — Characterization, FD-SOI, MOSFET, Work Function (WF), Gate Oxide, Channel Doping Concentration (CDC), Buried Oxide (BOX)

TS-11 (Ph.D. Symposium)

[10:45 AM-01:30 PM Room 5055]

- 75. An Intelligent Approach To Design A Personalized Search System Using Next Generation Big Data Analytics. [Paper ID- 201] Dr. Dheeraj Malhotra 76. Error Analysis of Space Shift Keying Systems [Paper ID- 202] A Anath 77. Studies On Feature Extraction And Fusion Techniques For Face Recognition [Paper ID- 203] Aniruddha Dey 78. Estimation and Optimization of Design Parameters in Diffusive Molecular Nanonetworks [Paper ID- 204] Satish K. Tiwari 79. Study And Performance Evaluation Of Quasi And Rotated Quasi Orthogonal Space Time Block **Coded MIMO Systems With Advance Detector Scheme Under Various Modulation Techniques** [Paper ID- 205] Priyanka Mishra 80. Design of Nearly Linear Phase Infinite Impulse Response Filters using Evolutionary Techniques [Paper ID- 206] Nikhil Agarwal 81. Performance Enhancement Of Digital Watermarking Techniques For Security Of Still Image [Paper ID- 207] Sudhanshu Gonge
- 82. Video Based Face Recognition For Biometric Authentication [Paper ID- 208]

Chengathir Selvi

TS-12 (IS&HCI + NLP)

[11:45 AM-01:30 PM Room 5006]

83. Undani – A System for Enhanced Farming [Paper ID- 48]

Ashish Srivastava, Rahul Mahajan, Dnyandeep Sagar and Pratik Shende (MIT Academy of Engineering)

Undani, a Sanskrit word which means reservoir of water for irrigation. Hardly one percent of the total water present on the earth is fresh water and easily accessible. Looking at the wastage of water in the surrounding, it is very obvious to predict that the upcoming generation will have to face the scarcity of water in near future. Considerable part of the waste water comes out through the traditional and manual irrigation techniques. Also it can be perceived that the quality crop production is decaying day by day due to lack of smart farming techniques and awareness about it. This paper deals with the efficient and convenient solution to these problems. In this paper, a miniature is proposed to detect the water content of the soil i.e. soil moisture using soil moisture sensor. The output of the sensor is then processed through ATmega328P microcontroller based Arduino UNO. The output of this Arduino determines whether action needs to be taken or not. The water pump input is then toggled accordingly. The proposed system is low cost and can be procured by farmers facing economic distress.

Keywords— sensor interface, moisture detection, automated irrigation, smart farming

84. Film Shooting Scheduler [Paper ID- 126]

Thirundi Perera, Malith Senarath, Ravindu Viduranga, Chathuranga Wijayananda, and Windhya Rankothge (Sri Lanka Institute of Information Technology)

Producing a movie involves difficult and time- consuming phases, specially, pre-production and production. It's a challenging task to find out suitable locations for each scene and building a schedule without any clashes. We have proposed and implemented a platform for film shooting management with following modules: (1) identify required background for each scene, (2) classify available film shooting locations, (3) compare the required background and available film shooting locations and (4) schedule the shooting of each scene. We have used natural language processing, image processing, string matching algorithms and optimization techniques to implement the above-mentioned modules. Our results show that, using our proposed modules, the film shooting management related services can be automated efficiently and effectively.

Keywords—Natural Language, Image Processing, Planning and Scheduling

85. Analysis of Multitasking in Divided Attention using Machine Learning [Paper ID- 133]

Bhanu Pratap Singh Bankoti, Chandra Shekhar Gupta, Oishila Bandyopadhyay and Mallika Banerjee (Indian Institute of Information Technology Kalyani)

Evaluation of cognitive functionality plays an im- portant role in the career choice of students as well as for the selection of employee for the employer. Divided attention is one such cognitive ability that deals with allocation of attention to multiple tasks simultaneously. An accurate analysis of divided attention would help us to identify cognitive decline, as well as provides a quantifiable indicator of a salient feature viz., vigilance which is highly relevant for defence personnel as well as pilots in air, water and road. The close observation of divided attention in home or classroom environment is an essential component for early detection of cognitive problems. It also helps in assessing the effectiveness of learning patterns. This work proposes a new method to determine the ability of relative divided attention through unobtrusive monitoring of use of a software game. The process measures the performance of a user (college student) on a multi-task cognitive software by computing the scores as part of the test for divided attention. This metric indicates the user's ability of multitasking in divided attention, i.e whether user is efficiently paying attention to all the tasks at once, or is primarily attending to one task at a time (sacrificing optimal performance). The data set is labelled based on statistical analysis. After classifying the data using machine learning model (random forest), the academic performance of the user is analysed against the divided attention levels to establish a correlation among them.

Keywords—Divided Attention, Multitasking, Cognitive com- puting, Random forest, Support vector machine

86. RealTime Tracking and Vehicle Monitoring in Surveillance Video [Paper ID- 161]

Ashish Singh Patel, O. P. Vyas and Muneendra Ojha (International Institute of Information Technology – Naya Raipur)

A video surveillance system has become an integral part of the smart city infrastructure. However, it still lacks its utilization to the full potential. In this work, we present a case study in which a storage center surveillance data has been used to extract useful information automatically. A surveillance camera records the movement of trucks passing through a storage center gate where a clerk registers the truck-related data. This process is prone to suffer from inaccuracy, fraud, and loss. The challenge is to automate the data entry process through video such that the warehouse achieves a seamless and error- free record-keeping. In this paper, we present a framework to use the surveillance video to extract useful information such as detection of trucks, their registration number/ownership identification, count of incoming and outgoing trucks, and count of loaded or empty trucks. We tested the work presented in this paper at the paddy storage centers in Chhattisgarh, India, and the results were very encouraging.

Keywords-Object Tracking, Smart City, Video Data Analytics, Video Surveillance, Event Identification

87. Quality-of-Service based Reliable Route Discovery using Ant Colony Optimization for VANET [Paper ID- 165]

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Vehicular ad-hoc network (VANET) is an emerging technology for intelligent transportation system giving rise to numerous applications for safety and non safety purposes. In VANET, vehicles are the dynamic node that establishes communication with other vehicles that are found within its transmission range via wireless technology. However, a highly effective routing protocol is the most challenging subject for VANET, because of its special characteristics such as: large network size, frequent disconnection, rapid changing topology etc. In this work, Ant-colony-optimization technique (ACO) is utilized to discover all possible routes through which data packets can be forwarded. To achieve a reliable communication, among those route the best route is selected that satisfy the QoS constraints in the form of stability and delay. The results depict that the proposed algorithm performs efficiently for dense environment. With reference to other existing protocols, RDACO proves to be more effective in terms of packet delivery ratio (PDR) and delay.

Keywords— Ant-colony-optimization (ACO), stability, delay, hop count, routing protocol, VANET.

88. Neural Machine Translation: English to Hindi [Paper ID- 49]

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Machine Translation (MT) attempts to minimize the communication gap among people from various linguistic backgrounds. Automatic translation between pair of different natural languages is the task of MT mechanism, wherein Neural Machine Translation (NMT) attract attention because it offers reasonable translation accuracy in case of the context analysis and fluent translation. In this paper, two different NMT systems are carried out, namely, NMT-1 relies on the Long Short Term Memory (LSTM) based attention model and NMT-2 depends on the transformer model in the context of English to Hindi translation. System results are evaluated using Bilingual Evaluation Understudy (BLEU) metric. The average BLEU scores of NMT-1 system are 35.89 (Test-Set-1), 19.91 (Test-Set-2) and NMT-2 system are 34.42 (Test-Set-1), 24.74 (Test-Set-2) respectively. The results show better performance than existing NMT systems.

Keywords—Machine Translation (MT), Neural Machine Translation (NMT), BLEU score, Attention Mechanism

89. Investigating the Challenges and Methodologies of Sentiment Analysis: A Review [Paper ID- 85]

Mayank Shrivastava and Shishir Kumar (Jaypee University of Engineering and technology, Guna, M.P.)

Humans act as a social animal and drive on intuitions. These intuitions are the result of sentiments whichone perceived through the life experiences. Applying analytics on Opinion Mining can help governments, businesses andeducational institutions to define policy that best suits the consumer base. This study aims to review researches onsentiment analysis where techniques vary from early attempts newly developed. The researches implementing supervised and discussed. Challenges and methodologies are the key points for selection ofliteratures. Tabular comparisons of the past researches havebeen provided. This paper is designed to provide a precise studyfor Sentiment Analysis.

Keywords- Sentiment Analysis, Text Analytics, Mining, Machine Learning, Deep Learning

90. A Language-independent gender classifier for Online Social Networks. [Paper ID- 104]

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Designing gender predictor for the Online Social Network (OSN) is receiving considerable attention from the research communities of different domains. However, the gender classifiers proposed by earlier studies for social media content so far, highly rely on the language used by the users for writing the content. It implies that the prediction model trained on one language (say English) will likely fail in identifying the gender of users with other languages (for example, Spanish). The study conducted in this paper aims to identify the features from user content on an OSN, which will assist in devising a Language-Independent Gender Classifier (LIGC). The experiments are performed on the Facebook networking site. The site provides the users with the list of various personal attributes that they may or may not reveal to other users on the network. The presented work collects such information of the Facebook users and carries out rigorous feature analysis to know whether this information varies between men and women on Facebook. Furthermore, several machine learning algorithms including Random Forest, SVM, Naïve Bayes, and kNN have been employed to determine the potential of the proposed feature set. Random forest approach achieves the highest value (70%) of performance metric, AUROC (Area under the Receiver Operating Characteristic). The current study is the first attempt to utilize information revelation for designing a gender identifier for OSN that is independent of the language used by the members.

Keywords—Online Social Networks, Facebook, Information Revelation, Gender Prediction, Machine Learning

91. Defocus based Novel Keyboard Design [Paper ID- 77]

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Depth map estimation from Defocus is a computer vision technique which has wide applications such as constructing the 3D setup from 2D image(s), image refocusing and reconstruct-ing 3D scenes. In this paper, we propose an application of Depth From Defocus to a novel keyboard design for detecting keystrokes. The proposed keyboard can be integrated with devices such as mobile, PC and tablets and can be generated by either printing on plain paper or by projection on a flat surface. The proposed design utilizes measured defocus together with a pre calibrated relation between the defocus amount and the keyboard pattern to infer the depth, which, along with the azimuth position of the stroke identifies the key. As the proposed design does not require any other hardware besides a monocular camera, this makes the proposed approach a cost effective and feasible solution for a portable keyboard.

Keywords—Virtual Keyboard, Human Computer Interac-tion, Depth, Defocus

92. A Color Similarity Based Thresholding Approach For Buried Land Mine Detection In Thermal Images. [Paper ID- 179]

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Thermal imaging based mine detection technique is widely adopted due it suitability of detecting buried metallic and also non-metallic land mines in battle fields. Accurate mine detection using thermal images depends on thermal contrast between the soil and mine and it is affected by various factors such as the depth of burial; soil properties and attributes, water content in the soil, mine properties; as well as the time of day of image acquisition. With temporal temperature variations of the soil, it is difficult to distinguish and discriminate between the buried object and the background in the thermal image using the conventionally followed binary thresholding approach in gray scale. This paper presents a multi criteria thresholding approach to identify the buried objects in thermal images using _Lab' color space and distinguish hot, cold regions of the soil. From the experimental results, it is proved that the proposed approach provides improved segmentation of different temperature regions in the thermal image as compared to the conventionally followed gray scale binary thresholding approach. Proposed method can be applied for land mine detection and automatic target recognition under varying buried depths of objects using thermal image processing approach.

Keywords— Thermal imaging, Lab color model, Multi color thresholding, Segmentation, Mine detection