Twenty Fourth National Conference on Communications (NCC 2018),

IIT Hyderabad, February 25-28, 2018

Program Booklet

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Organized by the Joint Telematics Group of the IITs and IISc

NCC-2018 Program At a Glance (Session wise)

Slot	Feb 25 (Sunday)			
	Auditorium	**LH1**	**LH2**	**R#220**
9:30am-12:40pm	Tutorial 1	Tutorial 2	Tutorial 3	
12:40pm-2:00pm	Lunch			
2:00pm-5:10pm	Tutorial 4	Tutorial 5	Tutorial 6	Tutorial 7

Slot	Feb 26 (Monday)			
	Auditorium	**LH1**	**LH2**	**R#220**
9:30am-11:10am	Cognitive Radio I	Sensor Networks	Speech Processing & Understanding	Antennas & Propagation
11:10am-11:40am	Networking Break			
11:40am-1:00pm	Inauguration and Plenary Talk by Prof P. P. Vaidyanathan, CalTech, USA			
1:00pm-2:00pm	Lunch			
2:00pm-3:40pm	Information Theory & Applications	Data Center Networking and Network Security & Invited Talk by Dr. Mohan Dhawan	Speech & Audio Applications & Invited Talk by Dr. Amod Anandkumar	Optical & Visible Light Communications
3:40pm-4:10pm	Networking Break			
4:10pm-5:10pm	Keynote by Dr. Rohit Kapoor, Qualcomm			
5:10pm-6:10pm	Cognitive Radio II & Relay Networks	Optical Networks	Speech Processing	
6:30pm-7:30pm	**JTG Meeting**			

Slot	Feb 27 (Tuesday)			
	Auditorium	**LH1**	**LH2**	**R#220**
9:30am-11:10am	Communications Theory I	Cellular Networks	Signal Processing	Microwave Communications
11:10am-11:30am	Networking Break			
11:30am-12:15pm	DoT & TSDSI Joint Session			
12:15pm-1:00pm	Keynote by Mr. Satish Mohanram, National Instruments		Signal Processing & Invited Talk by Mr. Anand Joshi	
1:00pm-2:00pm	Lunch			
2:00pm-3:40pm	Communications Theory II	Wireless Networks & Invited Talk by Prof. Subhash Bhalla	Image Understanding	Coding Theory & Applications
3:40pm-4:10pm	Networking Break			
4:10pm-5:10pm	5G Industry Session (NI)		Image Processing	
5:10pm-6:10pm	Communication Systems	Potpourri (Networks)	Machine Learning & Applications	Communication Networks & IoT
7:00pm-9:30pm	**Banquet**			

Slot	Feb 28 (Wednesday)			
	Auditorium	**LH1**	**LH2**	**R#220**
9:30am-10:10am	Invited Talk by Mr. Satish Jamadagni, Reliance Jio & TSDSI	Invited Talk by Prof. Ashwin Gumaste, IIT Bombay		
10:10am-11:10am	Keynote by Dr. David Maltz, Microsoft, USA			
11:10am-11:40am	Networking Break			
11:40am-12:40pm	Plenary talk by Prof. Lina Karam, ASU, USA			
12:40pm-2:00pm	Lunch			
2:00pm-3:40pm	Network Coding	SDN/NFV	Biomedical Signal processing	
3:40pm onwards	**Closing Session and High Tea**			

Welcome Message from the General & TPC Co-Chairs, NCC 2018

On behalf of the Organizing Committee, we welcome you with great pleasure to the twenty-fourth National Conference on Communications (NCC 2018). The conference will be held at IIT Hyderabad campus during February 25-28, 2018.

The National Conference on Communications (NCC) is a flagship conference in India dedicated to advanced research in the areas of Communications, Signal Processing and Networks. Over the years, it has emerged as a forum for researchers from academia and industry from all areas of communications, signal processing and networks to exchange their ideas, foster collaboration, and cover new grounds, and this year is no exception.

Thanks to the sincere efforts of the organizing committee and the dedication of the TPC and reviewers, we have a deep, diverse and excellent technical program that, apart from regular papers, includes two plenary lectures, three keynote presentations, six invited talks, 5G industry session, a special joint session from Department of Telecom (DoT), Govt. of India and Telecommunications Standards Development Society, India (TSDSI), industry demos, and 7 tutorial sessions. The conference received a total of 330 submissions this year from various parts of the country, and abroad. In keeping with the quality of the conference over the years, each paper was carefully reviewed by 2-5 reviewers from the TPC, with a final acceptance ratio of 32.7%. We congratulate all authors for the acceptance of their papers in the conference, and take the opportunity to thank all reviewers for their efforts in the success of the conference. A total of 108 papers will be presented across 28 sessions between Feb 26-28th, with a balanced distribution of topics between theory and application, as well as established and emerging areas. The tutorial sessions on Feb 25th will cover cutting-edge topics including blockchain, deep learning, and IoT. We encourage all participants to attend as many sessions as possible to make the most of the conference. We are confident that with the strong presence of academia, industry and standardization bodies at the conference, new synergies will be found, forging greater innovations in the years to come.

We are very grateful to the Joint Telematics Group (JTG), the coordination body of NCC consisting of IITs and IISc, for the opportunity to host NCC 2018 at IIT Hyderabad, especially considering 2018, being the 10th anniversary, holds a special place for the institution. We are thankful to Prof. U. B. Desai, Director of IIT Hyderabad and the chief patron of NCC 2018, for his continuous support and guidance. We are also grateful to the generous sponsorship of our industrial sponsors: Qualcomm (diamond sponsor), National Instruments (diamond sponsor), Tejas Networks (gold sponsor), Redpine Signals (gold sponsor), ADTRAN (gold sponsor), MathWorks (gold sponsor), and NVIDIA (silver sponsor), as well as the technical co-sponsors: IEEE and IEEE Hyderabad section.

We sincerely hope that you will have a rewarding and enjoyable time at NCC 2018 in Hyderabad. The city and its surroundings are pleasant at this time of year and have a lot to offer in terms of sights, heritage, cuisines and attractions.

We welcome each one of you again, and are grateful to each speaker, author, organizer, sponsor, volunteer and attendee for the success of NCC 2018.

General Co-Chairs: Bheemarjuna Reddy Tamma (IITH), Zafar Ali Khan (IITH)
TPC Co-Chairs: Anamitra Makur (NTU Singapore), Antony Franklin (IITH), Kiran Kuchi (IITH), Michael Ng (University of Southampton, UK), Vineeth N. Balasubramanian (IITH), T. Venkatesh (IIT Guwahati)

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Sunday 25 Feb 2018

9.30 am - 12.40 pm, Sunday

TUTORIAL 1 **ROOM: AUDITORIUM**

Building IoT Solutions with Edge Intelligence
Mr. Anand Joshi, Dr. N. Govinda Rao, Mr. Karthik Suryadevara, Redpine Signals

TUTORIAL 2 **ROOM: LH1**

Modeling and Analysis of mmWave Networks
Dr. Abhishek Kumar Gupta, IIT Kanpur

TUTORIAL 3 **ROOM: LH2**

An Introduction to Bitcoin
Dr. Saravanan Vijayakumaran, IIT Bombay

2.00 pm - 5.10 pm, Sunday

TUTORIAL 4 **ROOM: AUDITORIUM**

SDN/NFV within a telecommunications access network
Dr. Marc Kimpe and Mr Chris Thompson, ADTRAN

TUTORIAL 5 **ROOM: LH1**

Using SDR based testbeds to accelerate real-time prototyping
Mr. Raghunandan N V, National Instruments

TUTORIAL 6 **ROOM: LH2**

Online Learning with Dynamic Convex Optimization
Dr. Ketan Rajawat, IIT Kanpur

TUTORIAL 7 **ROOM: 220**

Demystifying Deep Learning - a Hands-On MATLAB Tutorial
Dr. Amod Anandkumar, Dr. Rishu Gupta, MathWorks

Monday 26 Feb 2018

9.30 am - 11.10 am, Monday

MON-1-COM1: COGNITIVE RADIO I
CHAIR: RAHUL VAZE **ROOM: AUDITORIUM**

9.30 ***Spectrum Sensing and Collision with Primary Users in MIMO Cognitive Radio***
Vijay Viswanath (Qualcomm India Pvt Ltd, India); Shahzad Alam (Qualcomm India Private Limited, India); Rakhesh Singh Kshetrimayum (Indian Institute of Technology Guwahati, India)

9.50 ***Optimization of Majority Rule Threshold in Double Threshold Based Cooperative Cognitive Radio Network***
Priyanka Maity (National Institute of Technology, Rourkela, Odisha, India); Siddharth Deshmukh (National Institute Of Technology, Rourkela, India)

10.10 ***Optimal Sequential Channel Sensing for Cognitive Radios for IID and Non-Identical Channels***
Aaqib Patel (IIT Hyderabad, India)

10.30 ***Generalized Statistical Spectrum Occupancy Modelling and Its Learning Based Predictive Validation***
Anirudh Agarwal (The LNM Institute of Information Technology, Jaipur, India); Ranjan Gangopadhyay (The L.N.Mittal Institute of Information Technology, India)

10.50 ***Cooperative Sensing of OFDM Signals Using Heterogeneous Sensors***
Akhil Singh (International Institute of Information Technology, Hyderabad, India); Prakash Gohain (International Institute of Information Technology Hyderabad, India); Sachin Chaudhari (International Institute of Information Technology, India)

MON-1-COM2: ANTENNAS & PROPAGATION
CHAIR: AMALENDU PATNAIK **ROOM: 220**

9.30 ***Graphene Plasmonic Bowtie Antenna for UWB THz Application***
Sasmita Dash (IIT Roorkee, India); Amalendu Patnaik (Indian Institute of Technology, Roorkee, India)

9.50 ***Design of Enhanced Gain Two Element Linear Microstrip Antenna Array***
Prahlada Rao (Gulbarga University & Gulbarga University, India); Vani M and Prabhakar Hunugund (Gulbarga University, India)

10.10 ***An Optically Transparent Microwave Broadband Absorber Using Resistive Sheet***
Harsh Sheokand, Gaganpreet Singh, Saptarshi Ghosh and Mondeep Saikia (Indian Institute of Technology Kanpur, India); Kumar Vaibhav Srivastava (Indian Institute of Technology, Kanpur, India); J Ramkumar (Indian Institute of Technology Kanpur, India); Anantha Ramakrishna (IIT kanpur, India)

10.30 ***Broadband Simultaneously Dual Circularly Polarized Planar Monopole for Single Antenna Diversity Reception and Transmission***
Bharath Reddy Gudibandi (National Institute Of Technology, Tiruchirappalli, India)

10.50 ***A Compact Dual-Band Resonator for Negative Permittivity Metamaterial at Microwave Regime***
Dushyant Marathe (Visvesvaraya National Institute of Technology, VNIT, Nagpur, India); Kishore Kulat (Visvesvaraya National Institute of Technology, VNIT, Nagpur)

MON-1-NW: SENSOR NETWORKS
CHAIR: MOHAN DHAWAN **ROOM: LH1**

9.30 ***Balanced Use of Battery Power in Ad-hoc Wireless Sensor Networks***
Hema Aggarwal (The LNM Institute of Information Technology, India); Santosh Shah (The LNM Institute of Information Technology, Jaipur India, India)

9.50 ***Range Free Localization in Anisotropic Networks Using Unbiased Distance Model***
Meera Bharathan, Mridula. K. M. and Ameer P M (National Institute of Technology Calicut, India)

10.10 ***A New Combinatorial Design Based Data En-Route Filtering Scheme for Wireless Sensor Networks***
Alok Kumar (National Institute of Technology Karnataka, Surathkal, India); Alwyn Roshan Pais (NITK, Suratkal, Mangalore India, India)

10.30 ***Energy-Efficient Air Pollution Monitoring with Optimum Duty-Cycling on a Sensor Hub***
Mayukh Roy Chowdhury (Indian Institute of Technology Delhi, India); Narendra Kumar Shukla (Shiv Nadar Univ

ersity, India); Swades De (Indian Institute of Technology Delhi, India); Ranendra Biswas (Shiv Nadar University, India)

10.50 ***Improved Energy Efficient Architecture for Wireless Sensor Networks with Mobile Sinks***
Prashanth Lingala, P Rajalakshmi and Soumil K Heble (Indian Institute of Technology Hyderabad, India)

MON-1-SP: SPEECH PROCESSING & UNDERSTANDING
CHAIR: PREETI RAO ROOM: LH2

9.30 ***Approaches to Codec Independent Speaker Identification in VoIP Speech***
Anil Chilli (Centre for AI and Robotics, India)

9.50 ***Improved Epoch Extraction Using Variational Mode Decomposition Based Spectral Smoothing of Zero Frequency Filtered Emotive Speech Signals***
Govind D and Pravena D (Amrita Vishwa Vidyapeetham, India); Ajay Ganesan (Amrita School of Engineering); Amrita Vishwa Vidyapeetham, India)

10.10 ***A Novel Feature for Nasalised Vowels and Characteristic Analysis of Nasal Filter***
Debasish Jyotishi (IIT, GUWAHATI, India); Suman Deb (Indian Institute of Technology, India); Samarendra Dandapat (IITG, India)

10.30 ***Manner of Articulation Based Split Lattices for Phoneme Recognition***
Pradeep R (Indian Institute of Technology, Kharagpur, India); K. Sreenivasa Rao (IIT KGP, India)

10.50 ***Exploiting Parts-of-Speech for Improved Textual Modeling of Code-Switching Data***
Ganji Sreeram (IIT Guwahati, India); Rohit Sinha (Indian Institute of Technology Guwahati, India)

11.40 am - 1.00 pm, Monday

INAUGURATION AND PLENARY LECTURE
ROOM:AUDITORIUM

Plenary Lecture: Srinivasa Ramanujan and Digital Signal Processing
Prof P. P. Vaidyanathan, CalTech, USA

2.00 pm - 3.40pm, Monday

MON-3-COM1: INFORMATION THEORY & APPLICATIONS
CHAIR: SIBI RAJ B PILLAI ROOM: AUDITORIUM

2.00 ***Communication and State Estimation over a State-Dependent Gaussian Multiple-Access Channel***
Viswanathan Ramachandran (Indian Institute of Technology Bombay, India); Sibi Raj B Pillai (IIT Bombay, India); Vinod M Prabhakaran (Tata Institute of Fundamental Research, India)

2.20 ***Gaussian MAC with Feedback and Strictly Causal State Information***
Haseen Rahman (Indian Institute of Technology Bombay, India); Sibi Raj B Pillai (IIT Bombay, India); Kumar Appaiah (Indian Institute of Technology Bombay, India)

2.40 ***On the Equivalence of Projections in Relative α-Entropy and Rényi Divergence***
Periyapatna Narayana Prasad Karthik and Rajesh Sundaresan (Indian Institute of Science, India)

3.00 ***Universal Compression of a Piecewise Stationary Source Through Sequential Change Detection***
Dheeraj Kumar Chittam (Honeywell Tech. Solutions Lab Pvt. ltd.); Rakesh K. Bansal (Indian Institute of Technology Kanpur & India, India)

MON-3-COM2: OPTICAL & VISIBLE LIGHT COMMUNICATIONS
CHAIR: G V V SHARMA ROOM: 220

2.00 ***Optimum Power Allocation for Uniform Illuminance in Visible Light Communication***
G V S S Praneeth Varma (IIT Hyderabad, India)

2.20 ***Comparative Analysis of Different Performance Enhancement Techniques in 2-D Atmospheric OCDMA System***
Ajay Yadav and Prateek Yadav (Indian Institute of Technology Delhi, India); Subrat Kar (Indian Institute of Technology, Delhi, India); V K Jain (IIT Delhi, India)

2.40 ***Generation of Perfectly DC Balanced Codes for Visible Light Communications***
Uday Thummaluri, Abhinav Kumar and Lakshmi Prasad Natarajan (Indian Institute of Technology Hyderabad, India)

3.00 ***Bi-Directional Indoor VLC System with Backhaul Solution***
Akash Gupta (Netaji Subhas Institute of Technology, India); Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India)

MON-3-NW: DATA CENTER NETWORKING AND NETWORK SECURITY
CHAIR: SWADES DE ROOM: LH1

2.00 ***ZEUS: Analyzing Safety of Smart Contracts***
Invited Talk by Dr. Mohan Dhawan, IBM Research

2.40 ***Caching Policies for Transient Data***
Santosh Fatale (Indian Institute of Technology Bombay, India); R Sri Prakash (IIT Bombay, India); Sharayu Moharir (Indian Institute of Technology Bombay, India)

3.00 ***ML-based Admission Control of Cloud Services: Centralized Versus Distributed Approaches***
Abul Bashar (Prince Mohammad Bin Fahd University, Saudi Arabia)

3.20 ***Inferring the Deployment of Source Address Validation Filtering Using Silence of Path-Backscatter***
Samant Saurabh (Shiv Nadar University, India); Ashok Singh Sairam (Indian Institute of Technology Guwahati, India)

MON-3-SP: SPEECH AND AUDIO APPLICATIONS
CHAIR: K. SRI RAMA MURTY ROOM: LH2

2.00 ***Energy-Weighted Multi-Band Novelty Functions for Onset Detection in Piano Music***
Krishna Subramani, Srivatsan Sridhar and Rohit Ananthanarayana (Indian Institute of Technology Bombay, India); Preeti Rao (IIT-Bombay, India)

2.20 ***Mridangam Artist Identification from Taniavartanam Audio***
Krishnachaitanya Gogineni and Jom Kuriakose (IIT Madras, India); Hema A Murthy (Indian Institute of Technology Madras, India)

2.40 ***Improving the Noise Robustness of Prominence Detection for Children's Oral Reading Assessment***
Kamini M Sabu (Indian Institute of Technology, Bombay, India); Kanhaiya Kumar (IIT Bombay, India); Preeti Rao (IIT-Bombay, India)

3.00 ***Cell-Phone Identification from Recompressed Audio Recordings***
Vinay Verma, Preet Khaturia and Nitin Khanna (Indian Institute of Technology Gandhinagar (IITGN), India)

3.20 ***What's New in MATLAB for Audio Signal Processing***
Invited Talk by Dr. Amod Anandkumar, MathWorks

4.10 pm - 5.10 pm, Monday

KEYNOTE TALK **ROOM: AUDITORIUM**

Making 5G NR a Commercial Reality: A unified, more capable 5G air interface
Dr. Rohit Kapoor, Qualcomm

5.10 pm - 6.10 pm, Monday

MON-5-COM1: COGNITIVE RADIO II AND RELAY NETWORKS
CHAIR: BHARAT BETTAGERE
ROOM:AUDITORIUM

5.10 ***Low Complexity Two-Stage Sensing Using Energy Detection and Beamforming***
Madhuri Latha (International Institute of Information Technology, India); Prakash Gohain (International Institute of Information Technology Hyderabad, India); Sachin Chaudhari (International Institute of Information Technology, India)

5.30 ***A Cognitive Opportunistic Fractional Frequency Reuse Scheme for OFDMA Uplinks***
Subbarao Boddu (Indian Institute of Technology Kharagpur, India); Venkata Sudhakar Reddy Bandi (Indian Institute of Technology, India)

5.50 ***Multihop FD Relaying with Fixed and Random Phase Errors***
Prabhat Kumar Sharma (Visvesvaraya National Institute of Technology, India); Kamal Agrawal (Indian Institute if Technology Delhi, India); Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India)

MON-5-NW: OPTICAL NETWORKS
CHAIR: ABHISHEK K GUPTA **ROOM: LH1**

5.10 ***Offline Scheduling Schemes to Transfer Voluminous Deadline Complying Data in Elastic Optical Networks***
Sridhar Iyer (Jain College of Engineering, India); Shree Prakash Singh (NSIT, India)

5.30 ***Performance Analysis of Non-Converged and Converged Medium Access Control Protocols for Radio-over-Fiber Networks***
Kshitiza Singh and Abhishek Dixit (Indian Institute of Technology Delhi, India); V K Jain (IIT Delhi, India)

5.50 ***Control and Management of Optical Networks Using Optical Network Description Language***
Nitin Lohar (Indian Institutel of Technology Delhi, India); Subrat Kar (Indian Institute of Technology, Delhi, India)

MON-5-SP: SPEECH PROCESSING
CHAIR: JIJI CHARANGATT VICTOR **ROOM: LH2**

5.10 ***Robust Offline Trained Neural Network for TDOA Based Sound Source Localization***
Srikanth Raj Chetupalli (Indian Institute of Science, India); Ashwin Ram (National Institute of Technology Tiruchirappalli, India); Thippur V. Sreenivas (Indian Institute of Science, India)

5.30 ***Disambiguation of Source and Trajectory Non-Stationarities of a Moving Acoustic Source***
Sai Gunaranjan Pelluri (Indian Institute of Science, Bangalore, India); Thippur V. Sreenivas (Indian Institute of Science, India)

5.50 ***Grouping Subarray for Robust Estimation of Direction of Arrival***
Tejaswini Dudyala, Srivally Munnangi and Senthil Kumar Mani (Meeami Technologies, India)

Tuesday 27 Feb 2018

9.30 am - 11.10 am, Tuesday

TUE-1-COM1: COMMUNICATIONS THEORY I
CHAIR: ABHINAV KUMAR **ROOM: AUDITORIUM**

9.30 ***Performance Analysis of a Gauss-Optimal Receiver for a Receive Diversity PLC System in Nakagami-m Noise Environment***
Soumya Prakash Dash (Indian Institute of Technology Delhi, India); Ranjan K. Mallik (Indian Institute of Technology - Delhi, India); Saif Khan Mohammed (Indian Institute of Technology Delhi, India)

9.50 ***Multiuser Communication Using Chirp Signals of Equal Chirp Rate***
Arijit Roy and Sharmistha Sen (Indian Institute of Technology Guwahati, India); Harshal Nemade (Indian Institute of Technology, India); Ratnajit Bhattacharjee (Indian Institute of Technology, Guwahati, India)

10.10 ***Fading-Averaged Symbol Error Probability Analysis of Full Duplex Amplify-and-Forward Relaying over Rayleigh Fading Channels***
Rahul Shrotey (BITS Pilani, Rajasthan, India); B. Sainath (BITS Pilani, India); Gaurav Sharma (BITS Pilani, Rajasthan, India)

10.30 ***BER Performance of Multi User Scheduling for MIMO-OFDM and MIMO-SCFDMA Broadcast Network with Imperfect CSI***
Vinay Kumar Trivedi and Preetam Kumar (Indian Institute of Technology Patna, India)

10.50 ***Error Rate of MIMO OSTBC Systems over Mixed Nakagami-m/ Rice Fading Channels***
Dharmendra Dixit (Indian Institute of Technology Bhubaneswar & The LNM Institute of Information Technology (LNMIIT), Jaipur, India); Pravas Ranjan Sahu (Indian Institute of Technology Bhubaneswar, India); George K. Karagiannidis (Aristotle University of Thessaloniki, Greece)

TUE-1-COM2: MICROWAVE COMMUNICATIONS
CHAIR: LAKSHMI NATARAJAN **ROOM: 220**

9.30 ***A Polarization-Independent Tunable Microwave Absorber with Wide Tuning Range***
Saptarshi Ghosh and Harsh Sheokand (Indian Institute of Technology Kanpur, India); Kumar Vaibhav Srivastava (Indian Institute of Technology, Kanpur, India)

9.50 ***A Simple Robust Equal-Split T-Junction Power Divider at Three Frequencies***
Deepayan Banerjee, Antra Saxena and Mohammad Hashmi (IIITD, India)

10.10 ***A Polarization-Insensitive Miniaturized Element Frequency Selective Surface Using Meander Lines***
Varuna A b, Saptarshi Ghosh and Harsh Sheokand (Indian Institute of Technology Kanpur, India); Kumar Vaibhav Srivastava (Indian Institute of Technology, Kanpur, India)

10.30 ***A Novel Meandered Coupled-Line Tri-Band Impedance Matching Network***
Antra Saxena, Deepayan Banerjee and Mohammad Hashmi (IIITD, India)

TUE-1-NW: CELLULAR NETWORKS
CHAIR: SUBHASH BHALLA **ROOM: LH1**

9.30 ***Throughput Optimal Scheduling for Wireless Down links with Reconfiguration Delay***
Vineeth Bala Sukumaran (Indian Institute of Space Science and Technology, Trivandrum, India)

9.50 ***Optimal Association of Wireless Devices to Cellular and Wi-Fi Base Stations***

Vineeth Bala Sukumaran (Indian Institute of Space Sci ence and Technology, Trivandrum, India); Chandramani Singh (Indian Institute of Science, India)

10.10 ***Modeling MME Residence Time in LTE Based Cellular Networks***
Ushasi Ghosh (NIT Durgapur, India); Pranay Agarwal (Indian Institute of Technology, Hyderabad, India); Abhinav Kumar (Indian Institute of Technology Hyderabad, India)

10.30 ***Channel Allocation for Multiple D2D-Multicasts in Un derlay Cellular Networks Using Outage Probability Minimization***
Ajay Bhardwaj and Samar Agnihotri (Indian Institute of Technology Mandi, India)

10.50 ***Spectrum Sharing for LTE-A Network in TV White Space***
Meghna Khaturia (IIT Bombay, India); Sweety Suman (IIT Bombay); Abhay Karandikar and Prasanna Chaporkar (IIT Bombay, India)

TUE-1-SP: SIGNAL PROCESSING
CHAIR: MRITYUNJOY CHAKRABORTY ROOM: LH2

9.30 ***Power System Frequency and Amplitude Estimation Using Variational Mode Decomposition and Chebfun Approximation System***
Neethu Mohan and Soman K P (Amrita Vishwa Vidyapeetham, India)

9.50 ***Co-Prime Sampling and Cross-Correlation Estimation***
Usham Dias and Seshan Srirangarajan (Indian Institute of Technology Delhi, India)

10.10 ***State-Space Digital Filters with Minimum Weighted Round-off Noise and Pole Sensitivity Subject to l_2-Scaling Constraints***
Yoichi Hinamoto (National Institute of Technology, Kagawa College, Japan); Akimitsu Doi (Hiroshima Institute of Tech nology, Japan)

10.30 ***Batch Look Ahead Orthogonal Matching Pursuit***
Muralikrishnna G. s. (National Institute of Technology, Tiruchirappalli, India); Sooraj K. Ambat and K. v. s. Hari (Indian Institute of Science, India)

10.50 ***Functorial Signal Representation: Foundations and Redundancy***
Salil Samant and Shiv Dutt Joshi (Indian Institute of Tech nology, Delhi, India)

11.30 am - 12.15 pm, Tuesday

SPECIAL SESSION ON 5G ROOM: AUDITORIUM

5G Initiatives in India and Telecom Standardization: Role of TSDSI
Mr. N Sivasailam and Mr. R. K. Pathak, DoT, GoI; Mr. Satish Jamadagni, SG1 Chair, TSDSI

12.15 pm - 1.00 pm, Tuesday

KEYNOTE TALK ROOM: AUDITORIUM

A Platform Approach to 5G: Design, Prototyping and Test
Mr. Satish Mohanram, National Instruments

TUE-2-SP: SIGNAL PROCESSING AND INVITED TALK
CHAIR: G V V SHARMA ROOM: LH2

12.15 ***Enhanced Convergence Distributed Arithmetic Based LMS Adaptive Filter Using Convex Combination***
Tasleem Khan and Shaik Rafi Ahmed (Indian Institute of Technology, Guwahati, India)

12.35 ***Invited Talk on Signal Processing (Accelerating AI Applications in Hardware)***
Anand Joshi (Redpine Signals, Hyderabad, India)

2.00 pm - 3.40 pm, Tuesday

TUE-3-COM1: COMMUNICATIONS THEORY II
CHAIR: RANJAN K MALLIK ROOM: AUDITORIUM

2.00 ***Training-Based Joint Antenna and Relay Selection in Multiuser Downlink Cellular Network with RF Im pairments***
Anoop Kumar Mishra (National Institute of Technology Rourkela, India); Poonam Singh (National Institute Of Technology, Rourkela, India)

2.20 ***Modeling and Outage Analysis of DF Relay Assisted Mixed PLC-VLC System***
Manan Jani and Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India); Akash Gupta (Netaji Sub has Institute of Technology, India)

2.40 ***Performance Evaluation and Optimization of Mul tiantenna Two-Way Relaying System with CCI***
Imtiyaz Khan (NIT Rourkela, India); Dhulipudi Kanth (NIT Rourkela, India); Poonam Singh (National Institute Of Technology, Rourkela, India)

3.00 ***Impact of Underlaid Multi-antenna D2D on Cellular Downlink in Massive MIMO Systems***
Amit Agarwal and Sudarshan Mukherjee (Indian Institute of Technology Delhi (IITD), India); Saif Khan Mohammed (Indian Institute of Technology Delhi, India)

3.20 ***Closed-form Approximations for Coverage and Rate in a Multi-tier Heterogeneous Network in Nakagami-m Fading***
G V S S Praneeth Varma (IIT Hyderabad, India); Gvv Sharma and Abhinav Kumar (Indian Institute of Technology Hyderabad, India)

TUE-3-COM2: CODING THEORY & APPLICATIONS
CHAIR: PRASAD KRISHNAN ROOM: 220

2.00 ***A Rate-Optimal Construction of Codes with Sequential Recovery with Low Block Length***
Balaji Srinivasan Babu (IISc, India); Ganesh Kini (Indian Institute of Science, India); P Vijay Kumar (Indian Institute of Science & University of Southern California, India)

2.20 ***On Maximally Recoverable Codes for Product Topo logies***
D. Shivakrishna (IIIT Hyderabad, India); V. Arvind Rameshwar (BITS Pilani, Hyderabad Campus, India); V. Lalitha (International Institute of Information Technology, India); Birenjith Padmakumari Sasidharan (Indian Institute of Science, India)

2.40 ***Rewrite Cost Optimal Rank Modulation Codes in S4 and S5***
Arijit Dutta and Saravanan Vijayakumaran (IIT Bombay, India)

3.00 ***Permutation Polynomial Representatives and Their Matrices***
Megha Kolhekar (Electrical Engineering Department IIT Bombay); Harish Pillai (Indian Institute of Technology Bombay, India)

3.20 ***Determining the Generalized Hamming Weight Hier archy of the Binary Projective Reed-Muller Code***
Vinayak Ramkumar and Myna Vajha (Indian Institute of Science, India); P Vijay Kumar (Indian Institute of Science & University of Southern California, India)

TUE-3-NW: WIRELESS NETWORKS
CHAIR: VINEETH BALA SUKUMARAN ROOM: LH1

2.00 ***Independent Dependency Tracking in Mobile Ad hoc Networks***
Invited Talk by Prof. Subhash Bhalla

2.40 ***A Frequency Assignment Technique for Effective SINR and Throughput Management in a Battlefield***
Athindran Ramesh Kumar (Center for Excellence in Wire less Technology & Indian Institute of Technology Madras, India); Navinnath Palanisamy and Klutto Milleth (Centre of Excellence in Wireless Technology, India)

3.00 ***Optimal Rate Control in a Quasi-Static Wireless Fading Channel with Throughput and Power Constraints***
Rahul R and Utpal Mukherji (Indian Institute of Science, India)

3.20 ***Dynamic Beam Assignment in Narrow Beamforming and mmWave Systems***
Arzad Kherani (Indian Institute of Technology, Bhilai, India); R M Karthik (Samsung India Software Operations, India)

TUE-3-SP: IMAGE UNDERSTANDING
CHAIR: PRITHWIJIT GUHA ROOM: LH2

2.00 ***A Deep Learning Based Technique for Anomaly De tection in Surveillance Videos***
Vinod Pankajakshan (Indian Institute of Technology Roor kee, India); Prakhar Singh (IIT Roorkee, India)

2.20 ***Weighted Nuclear Norm and TV Regularization Based I mage Deraining***
Baiju P S and Deepak P (National Institute of Technology Calicut, India); Sudhish N George (National Institute of Technology, Calicut, India)

2.40 ***Multiview 3D Reconstruction of Underwater Scenes Acquired with a Single Refractive Layer Using Struc ture from Motion***
Parvathi VS (College of Engineering Trivadrum, India); Jiji Charangatt Victor (College of Engineering, Trivandrum, India)

3.00 ***Forgery Detection in Digital Images Through Lighting Environment Inconsistencies***
Aniruddha Mazumdar, Jefin Jacob and Prabin Kumar Bora (Indian Institute of Technology Guwahati, India)

3.20 ***Spatio-Spectral Compression and Analysis of Hy perspectral Images Using Tensor Decomposition***
Renu K (Amrita University, India); V Sowmya (Amrita Vishwavidyapeetham, India); Soman K P (Amrita Vishwa Vidyapeetham, India)

4.10 pm - 5.10 pm, Tuesday

5G INDUSTRY SESSION ROOM: AUDITORIUM

Paving the Way to 5G: Where we are & What we need to do?
Mr. Farris Alhorr, National Instruments

TUE-4-SP: IMAGE PROCESSING
CHAIR: VINOD PANKAJAKSHAN ROOM: LH2

4.10 ***Full Reference Quality Assessment of Full HD Images Using Combined Saliency Priors in Multi-Scale***
Sameeulla Khan MD (Indian Institute Of Technology Hy derabad, India)

4.30 ***Symmetric Chaos-Based Image Encryption Technique on Image Bit-Planes Using SHA-256***
Abhilash Bhadke (Visvesvaraya National Institute of Tech nology, India); Surender Kannaiyan (Visvesvaraya National Institute of Technology); Vipin Kamble (Visvesvaraya Na tional Institute of Technology, India)

4.50 ***An Irrotationality Preserving Total Variation Algorithm for Phase Unwrapping***
Bhargav Ghanekar and Dipak Narayan (Indian Institute of Technology Madras, India); Uday Khankhoje (Indian Institute of Technology Madras)

5.10 pm - 6.10 pm, Tuesday

TUE-5-COM1: COMMUNICATION SYSTEMS
CHAIR: PARUL GARG ROOM: AUDITORIUM

5.10 ***Hybrid Satellite-Terrestrial Cooperative Communi cation with Mobile Terrestrial Nodes***
Neeraj Varshney and Aditya K Jagannatham (Indian In stitute of Technology Kanpur, India)

5.30 ***System Design Aspects of Ka-Band High Throughput Satellite (HTS) for Indian Region***
Neha Mehra (Space Applications Centre, ISRO, India); Abhishek Kakkar and Subhash Bera (Space Applications Centre; ISRO, India)

5.50 ***A Study on Pathloss Model for UAV Based Urban Dis aster and Emergency Communication Systems***
Alok Ranjan (National Institute Of Technology, Rourkela, India); Bighnaraj Panigrahi and Hemant Kumar Rath (Tata Consultancy Services, India); Prasant Misra (TATA Con sultancy Services, India); Anantha Simha (Tata Con sultancy Services, India); H Sahu (NIT Rourkela, India)

TUE-5-COM2: COMMUNICATION NETWORKS & IOT
CHAIR: SWADES DE ROOM: 220

5.10 ***The Effect of Introducing Redundancy in a Probabilistic Forwarding Protocol***
Vinay Kumar B. R. (Indian Institute of Science, India); Roshan Antony (Qualcomm India, India); Navin Kashyap (Indian Institute of Science, India)

5.30 ***Energy-Delay-Distortion Problem***
Rahul Vaze (TIFR Mumbai, India); Akshat Choube (IIT-Palakkad, India); Shreyas Chaudhari (IIT-Madras, India); Nitin Aggarwal (IIT-Roorkee, India)

5.50 ***Minimizing Energy Theft by Statistical Distance Based Theft Detector in AMI***
Sandeep Kumar Singh (Indian Institute of Technology Delhi, India); Ranjan Bose (Indian Institute of Technology, India); Anupam Joshi (UMBC, USA)

TUE-5-NW: POTPOURRI - NETWORKS
CHAIR: ARZAD KHERANI ROOM: LH1

5.10 ***Deterministic Evolution Through Indexed Leaf Node Based Attachment in Complex Networks***
Gautham Suresh and Abhishek Chakraborty (Indian In stitute of Space Science and Technology, India); Manoj Bs (Indian Institute of Space Science and Technology; Cali fornia Institute of Telecommunication and IT, India)

5.30 ***PPoS: A Novel Sub-flow Scheduler and Socket APIs for Multipath TCP (MPTCP)***
Abhijit Mondal (IIT Kharagpur, India); Aniruddh Rao Kab binale (University of Cambridge, United Kingdom (Great Britain)); Samar Shailendra, Hemant Kumar Rath and Arpan Pal (Tata Consultancy Services, India)

5.50 ***Fraction of Connections Among Friends of Friends as a New Metric for Network Analysis***
Kumar Gaurav (Indian Institute of Technology, Kanpur, India); Sateeshkrishna Dhuli and Yatindra Nath Singh (Indian Institute of Technology Kanpur, India)

TUE-5-SP: MACHINE LEARNING AND APPLICATIONS
CHAIR: TAKAO HINAMOTO ROOM: LH2

5.10 ***Dictionary Learning Based Fingerprinting for Indoor Localization***
Chirag Kumar (IIT Kanpur, India); Ketan Rajawat (Indian Institute of Technology Kanpur, India)

5.30 ***Human Activity Classification in Smartphones Using Shape Descriptors***
Ankita Jain and Vivek Kanhangad (IIT Indore, India)

5.40 ***Progressively Balanced Multi-class Neural Trees***
Prithwijit Guha, Ameya Godbole and Spoorthy Bhat (IIT Guwahati, India)

Wednesday 28 Feb 2018

9.30 am - 10.10 am, Wednesday

INVITED TALK ROOM: AUDITORIUM

5G: What is missing and What it should be
Mr. Satish Jamadagni, Reliance Jio & TSDSI

INVITED TALK ROOM: LH1

Terabit SDN Router: Design and Development
Prof. Ashwin Gumaste, IIT Bombay

10.10 am - 11.10 am, Wednesday

KEYNOTE TALK ROOM: AUDITORIUM

Beyond Software Defined Networking: When Software Isn't Fast Enough
Dr. David A. Maltz, Microsoft USA

11.40 am - 12.40 pm, Wednesday

PLENARY LECTURE ROOM: AUDITORIUM

Generative Sensing: Transforming Unreliable Sensor Data for Reliable Recognition
Prof Lina Karam, ASU, USA

2.00 pm to 3.40 pm, Wednesday

WED-3-COM1: NETWORK CODING
CHAIR: V. LALITHA ROOM: AUDITORIUM

2.00 ***Optimal Index Codes via a Duality Between Index Coding and Network Coding***
Ashok Choudhary (IIIT Hyderabad, India); Vamsi Krishna Gummadi (IIIT HYDERABAD, India); Prasad Krishnan (IIIT Hyderabad, India)

2.20 ***On Linear Codes for Broadcasting with Noisy Side Information***
Suman Ghosh (IIT Hyderabad, India); Lakshmi Prasad Natarajan (Indian Institute of Technology Hyderabad, India)

2.40 ***Index Coding: Rank-Invariant Extensions***
Vamsi Krishna Gummadi (IIIT HYDERABAD, India); Ashok Choudhary and Prasad Krishnan (IIIT Hyderabad, India)

WED-3-NW: SDN/NFV
CHAIR: KOTARO KATAOKA ROOM: LH1

2.00 ***Analysis of Computational Complexity and Power Consumption in Cloud Based Heterogeneous RAN***
Ramakrishnan S and Subrat Kar (Indian Institute of Technology, Delhi, India); Dharmaraja Selvamuthu (IIT Delhi, India)

2.20 ***Providing Resiliency for Service Function Chaining in NFV Systems Using a SDN-based Approach***
Karthik Karra (Indian Institute of Technology, Madras, India); Krishna M. Sivalingam (Indian Institute of Technology Madras, India)

2.40 ***A Machine Learning Approach for Detecting DoS Attacks in SDN Switches***
Abhiroop T (Indian Institute of Space Science and Technology, India); Sarath Babu (Indian Institute of Space Science and Technology (IIST), India); Manoj Bs (Indian Institute of Space Science and Technology & California Institute of Telecommunication and IT, India)

WED-3-SP: BIOMEDICAL SIGNAL PROCESSING
CHAIR: P. RAJALAKSHMI ROOM: LH2

2.00 ***Identification of Coronary Artery Diseased Subjects Using Spectral Features***
Pranab Samanta (IIT Kharagpur); Akanksha Pathak (IIT Kharagpur, India); Kayapanda Mandana (Fortis Healthcare Limited, India); Goutam Saha (IIT Kharaghpur, India)

2.20 ***Subspace Based CS-MUSIC for Diffuse Optical Tomography***
B p v Dileep (IIT KHARAGPUR, India)

2.40 ***Region Selective Information Augmentation for Retinal Images***
Vineeta Das (Indian Institute of Technology, Guwahati, India); Samarendra Dandapat (IITG, India); Prabin Kumar Bora (Indian Institute of Technology Guwahati, India)

3.00 ***Nonlinear State Estimation Technique Implementation for Human Heart Model***
Amit Waghmare and Pradhnya Priyadarshi (Visvesvaraya National Institute of Technology, India); Surender Kannaiyan (VNIT, Nagpur, India); Vipin Kamble (Visvesvaraya National Institute of Technology, India)

3.20 ***Fully Automatic Segmentation of Intima Media Complex in Common Carotid Artery Using Adaptive Wind Driven Optimization***
Pardhu Madipalli, Sandeep Kotta and Harish Dadi (National Institute of Technology Karnataka, India); Nagraj Y and Asha C. S. (National Institute of Technology, Karnataka, India); V Narasimhadhan A (NITK, India)

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