BITES
BOARD FOR IT EDUCATION STANDARDS

BITES Annual Convention - 2019

(Theme – Communication and Computing Standards)

In association with

IIIT Dharwad
ज्ञानेन विकासः

IIIT - Dharwad

&

BNM Institute of Technology, Bengaluru

Book of Abstracts

November 22-23, 2019
BNM Institute of Technology
BSK II Stage, Bengaluru

Helping to keep Karnataka at the forefront of IT

ANNUAL CONVENTION 2019

BOARD FOR IT EDUCATION STANDARDS

BOARD FOR IT EDUCATION STANDARDS
305, Second Floor, Aryabhata Block, IIIT-B Campus
26/C, Electronics City Phase 1, Hosur Road, Bangalore - 560 100
Website: www.bites.org.in

Vision

To establish Karnataka as the acknowledged leader in Information Technology by fostering high quality industry-relevant IT education

Mission

To serve as a catalyst for nurturing Excellence in our IT educational institutions, ensuring employability of our Graduates, promoting Quality of work of our Faculty, strengthening interactions and networking among Stakeholders, and enhancing global competitiveness of our IT industry

Key Activity Areas

- *Advice on Policy*
- *Competitions and Awards*
- *Curriculum Development*
- *Databases*
- *Industry –Institute Interaction*
- *Institutional Development*
- *IT Education Standards*
- *Leadership Development*

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BITES ANNUAL CONVENTION 2019

About the Theme – "Communication and Computing Standards"

A benchmark / criterion / yardstick, as approved by a recognized standards organization, is accepted as a de facto standard by the industry as it helps in mobility / portability of components / interfaces developed by different industries. Establishment of standards also helps each industry to specialize / concentrate on particular aspect / module of a system by avoiding / reducing duplication effort. Without standards, only hardware and software from the same company could have be used together. Standards exist for programming languages, operating systems, data formats, communication protocols, and electrical interfaces. Standards, from a user's standpoint, are extremely important in the computer industry because they allow the combination of products from different manufacturers to create a customized system. In addition, standard user interfaces can make it much easier to learn how to use new applications. Most official computer standards are set by organizations such as ANSI (American National Standards Institute), ITU (International Telecommunication Union), IEEE (Institute of Electrical and Electronic Engineers), ISO (International Standards Organization) and VESA (Video Electronics Standards Association).

IEEE sets standards for most types of electrical interfaces. Its most famous standard is probably RS-232C, which defines an interface for serial communication. This is the interface used by most modems, and a number of other devices, including display screens and mice. IEEE is also responsible for designing floating-point data formats. While IEEE is generally concerned with hardware, ANSI is primarily concerned with software. ANSI has defined standards for a number of programming languages, including C, COBOL and FORTRAN. ITU defines international standards, particularly communications protocols such as V.22, V.32, V.34 and V.42 for transmitting data over telephone lines.

Despite the growing importance of these standards to a very large community of computer system builders and users, the standards-making process is not widely understood. It has a language of its own and its metabolism is extremely confusing to those who are not actively involved. These reports are motivated by the belief that better standards - timelier, more relevant, and closer to the state of the art - will result from a more widely informed community of interest. Experts would enlighten the audience about the standards used in some of communication and computing products in this convention.

About Board for IT Education Standards (BITES)

BITES is an autonomous body promoted by Government in association with Institutions and industries in Karnataka in the year 2000. GoK has setup BITES with the intent of maintaining high standards and quality in IT education. The main objectives of BITES are to enhance the quality of IT Education and improve the employability of Engineering Graduates. The Vision of BITES is "To establish Karnataka as the acknowledged leader in Information Technology by fostering high

quality industry-relevant IT education". The key activity areas of BITES are: Advice on Policy, Challenge / Competitions and Awards, Curriculum Development, Databases, Industry–Institute Interaction, Institutional Development, IT Education Standards and Leadership Development. BITES promotes, encourages, and deep dives into industry-academia equations on a number of platforms. It is this equation which will differentiate Winners from Losers. This is more so because of the exponential changes and transformations taking place in the tech space. Industry relevance of education is the only mantra for survival in the TED-Age. BITES is the quintessential bridge to help in bringing together academia-industry and in setting benchmarks, in line with industry expectations. BITES is the way forward and partnering with it is imperative for every teaching institute, benefiting both the faculty and the student community.

About BNM Institute of Technology, BSK II Stage, Bengaluru

BNM Educational Institutions was established by the trust Bhageerathi Bai Narayana Rao Maanay Charities in the year 1972. The Managing Trustee Shri. N. Raghunath Rao Maanay along with Prof. Sunanda P Jadhav the founder Secretary and Principal founded the institution with a focused vision to impart value-based quality education irrespective of social, financial or religious status. Prof. Sunanda P. Jadhav strived to provide education at affordable cost especially to the girl children and her unstinted efforts yielded highly commendable results. From a humble beginning the BNM Educational Institutions is now a leader in the field of education, providing the most modern education while maintaining the rich cultural heritage of the great India. BNM is an amalgam of Educational Institutions consisting of BNM Montessori House, BNM Primary School (State Syllabus), BNM High School (State Syllabus), BNM Public School (Central Syllabus), BNM PU College, BNM Degree College and BNM Institute of Technology (BNMIT).

BNM Institute of Technology, established in 2001, is a private technical co-educational school affiliated to the Visvesvaraya Technological University (VTU), Belagavi. BNMIT is an ISO 9001:2008 Certified Institute (TUVRheinland). It offers 5 UG and 6 PG programs in addition to PhD programs. BNMIT is among the top Engineering Colleges under VTU with excellent results by securing 71 ranks and 43 Gold medals from VTU. It has been accredited with grade A by NAAC and secured NBA accreditation, for 3 years, for all UG engineering programs in CSE, ECE, EEE, ISE & ME.

About Indian Institute of Information Technology Dharwad (IIIT-DWD)

IIIT-Dharwad is an Institute of National Importance set up in Public-Private-Partnership (PPP) mode by the Ministry of Human Resource Development (MHRD) of Government of India, Government of Karnataka and industrial partner KEONICS. Located in the twin cities of Hubballi-Dharwad, the Institute has faculty in Computer Science as well as Electronics and Communication Engineering with several of them having research interest and experience in the areas of Machine Learning, Artificial Intelligence and Data Analytics. Admission to the Indian

Institute of Information Technology is through the Central Seat Allocation Board (CSAB) / Joint Seat Allocation Authority (JoSAA). A new campus for the IIIT-DWD is proposed to be built in 61.06 acres of land at Tadasinakoppa near Dharwad.

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(Theme - Communication and Computing Standards)

November 22-23

BNMIT, Bengaluru

PROGRAM SCHEDULE

Day-1		
1.	**08.30 AM - 09.30 AM**	**Registration**
2.	**09.30 AM - 11.00 AM**	**Inauguration**
3.	**11.00 AM - 11.30 AM**	**Tea**
4.	**11.30 AM-012.10 PM**	**"Do standards have a place in Engineering Curriculum?" by Dr. C P Ravikumar, Director, Talent Development, TI, Bengaluru**
5.	**12.10 PM-01.00 PM**	**"Standards in 5G Communication" by Sri P Ramakrishna, CEO, India Mobile Commerce**
6.	**01.00 PM-01.50 PM**	**Lunch**
7.	**01.50 PM-02.05 PM**	**Music Interlude**
8.	**02.05 PM-02.45 PM**	**"Communication Protocol Standards for IOT" by Prof. Prabhakar T.V., Principal Research Scientist, DESE, IISc**
9.	**02.45 PM-03.00 PM**	**Tea**
10.	**03.00 PM-03.40 PM**	**"Functional Safety in Automotive 2.0 Era" by Sri Prasanth Viswanathan Pillai, TI, Bengaluru**
11.	**03.40 PM-04.20 PM**	**"Inner Engineering and Design Challenges for Current Day Electronics Systems" by Mr. SLN Murthy, Principal Consultant, Wuerth Electronik India Pvt. Ltd, and Member, IPC Advisory Committee, India**
12.	**04.20 PM - 04.50 PM**	**"The Shift - Regulation and Policy follows Innovation" by Mr. Gururaj Uday Nayak Co-Founder and CEO, QOGNO Digital Infrastructure Pvt. Ltd.**
Day-2		
13.	**9.30 AM - 10.10 AM**	**"Data Standards for e-Healthcare" by**

		Dr. Kavi Mahesh, Director, IIIT, Dharwad
14.	10.10 AM - 11.00 AM	"Standards in Satellite Communication" by Prof. V Sambasiva Rao, Director, CORI, PES University, Bengaluru
15.	11.00 AM - 11.30 AM	Tea
16.	11.30 AM-12.20 PM	"Standards in Software Engineering" by Mr. Krishna Swamy Subbarao, Infosys
17.	12.20 PM-1.00 PM	"Collaboration for Innovation in Education" by Sri Aniruddha Kannal, CEO, Xcelerator
18.	01.00 PM-01.50 PM	Lunch
19.	01.50 PM-02.05 PM	Music Interlude
20.	02.05 PM-02.55 PM	"Ethernet in the world of Automotive and Industrial Electronics – Needs, Similarities, and Differences" by Ms. Gayathri Seshadri, TI, Bengaluru
21.	02.55 PM-03.15 PM	Tea
22.	03.15 PM-04.30 PM	Valediction: Presentation of "BITES Life Achievement Award-2019" Ceremony

FOREWORD

Board for IT Education Standards (BITES) was established in year 2000 with the objective of helping educational institutions offering IT education in terms of enhancing quality and adopting industry-relevant curriculum as well as improving employability of the graduates.

Annual Activities

- TCS TechBytes
- Best PhD Thesis awards
- BITES-Xcelerator Student Project Awards
- BITES Lifetime Achievement Awards
- BITES Annual Conventions

Regular Activities

- Hands-on workshops on topics of current relevance
- Workshops on soft skills for students and staff (both teaching and non-teaching), Distinguished Guest Lectures (DGLs)
- Celebrities and Celebrations (CAC) lectures
- Workshops on accreditation and pedagogy

The theme chosen for Annual Convention – 2019 is ***"Communication and Computing Standards"***. For operability in a globalized world, every product / component / system must adhere to certain accepted standards to ensure compatibility, safety, reliability and quality. A family of standards have been developed and accepted for everything from shoes to connectivity. In this convention, interactions with experts from Communication and Computing domains have been organized to create awareness among the participants. Communication standards include those define syntax, semantics and synchronization implemented in hardware, software or both. Similarly, computing standards include software, systems, computer monitors, video adapters, platforms, devices and interfaces.

ELEVEN eminent speakers delivered technical talks related to the theme. BNMIT students shall present the Music Interludes on both the days. Around 150 participants are expected to attend the convention. "BITES Lifetime Achievement Award-2019" shall be presented to Dr Srinivasan Ramani, Founder, National Centre for Software Technology (NCST) and Prof S Sadagopan, Director, IIITB who have significantly contributed for the growth IT sector and IT education respectively.

BITES ANNUAL CONVENTION 2019

We thank all the dignitaries who preside over the inaugural and valedictory sessions, speakers for their talks, Awardees for accepting the awards, BNMIT Staff & Students for their unstinted support, participants for their presence and our honourable board & institutional members for making the convention a grand success.

Professor K N Balasubramanya Murthy
Chairman, BITES & Vice-Chancellor, PES University

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"Do standards have a place in engineering curriculum?"

Dr. C.P. Ravikumar
Director, Talent Development, TI, Bengaluru

Abstract:
While there may be general agreement to the thought that exposure to standards is important for a graduating engineer, including a discussion on standards in an engineering class is not always easy. The challenges that engineering teachers may face will include access to literature on standards, the complexity of such documents, and how to make the discussion engaging. When electives are offered in new and emerging topics, the standards are often emerging. This talk will explore questions such as what aspects of standards, if any, must be taught as part of an engineering course, what are the challenges that an engineering teacher will face in including them in a curriculum, and how to address these challenges.

About the Speaker:
C.P. Ravikumar is presently the Director of Talent Development at Texas Instruments, India. He is also an adjunct faculty at IIT Madras. Before joining TI India in 2001, Ravikumar was a Professor of Electrical Engineering at the Indian Institute of Technology, Delhi (1991-2001). He also held a visiting position at the University of Southern California (1995-1996) and the position of Vice President (Training) at Controlnet India Pvt Ltd (2000-2001). He obtained his Ph.D. (Computer Engineering) from the University of Southern California (1991), M.E. in Computer Science with highest scores from Indian Institute of Science (1987) and B.E. in Electronics with a Gold Medal from Bangalore University (1983). He has published over 200 papers in leading International conferences and journals. He has 4 US patents in the area of VLSI Test. He founded the VLSI Design and Test Symposium (VDAT) and has been the General Chair of this event from its inception in 1998. He is the author/editor/coauthor of over 15 books in areas of VLSI and has contributed several book chapters. He has served as an associate editor of IEEE Transactions on Circuits and Systems and has served on

editorial board of the Journal of Electronic Testing – Theory and Applications and the Journal of Low Power Electronics. He has won the best paper award at IEEE International Conference on VLSI Design (2002) and VLSI Test Symposium (2005). He is a Senior Member of IEEE, honorary secretary of IEEE CAS Bangalore chapter which he founded, and the honorary secretary of VSI. He has served on the Execom of IEEE Bangalore Section (2017-current).

“Standards in 5G communication”

Sri. P.Ramakrishna,
CEO, India Mobile Commerce

Abstract

5G is the fifth generation of cellular network technology, which follows 2G, 3G, 4G, and their respective associated technologies such as GSM, UMTS, LTE, LTE Advanced Pro, and others. In 5G, the service area covered is divided into small geographical areas called cells. In addition to traditional mobile operator services, 5G also addresses specific requirements for private mobile networks ranging from industrial IoT to critical communications. Analog signals representing sounds and images are digitized in the telephone, converted by an Analog to Digital Converter (ADC) and transmitted as a stream of bits. All the 5G wireless devices in a cell communicate by radio waves with a local antenna array and low power automated transceiver (transmitter and receiver) in the cell, over frequency channels assigned by the transceiver from a pool of frequencies that are reused in other cells. The local antennas are connected with the telephone network and the Internet by a high bandwidth optical fiber or wireless backhaul connection. As in other cell networks, a mobile device crossing from one cell to another is automatically "handed off" seamlessly to the new cell.

There are plans to use millimeter waves for 5G. Millimeter waves have shorter range than microwaves, therefore the cells are limited to smaller size. The waves also have trouble passing through building walls. Millimeter wave antennas are smaller than the large antennas used in previous cellular networks. They are only a few inches (several centimeters) long. Another technique used for increasing the data rate is massive MIMO (multiple-input multiple-output). Each cell will have multiple antennas communicating with the wireless device, received by multiple antennas in the device, thus multiple bitstreams of data will be transmitted simultaneously, in parallel. In a technique called, beamforming, the base station computer will continuously calculate the best route for radio waves to reach each wireless device, and will organize multiple

antennas to work together as phased arrays to create beams of millimeter waves to reach the device.

The new 5G wireless devices also have 4G LTE capability, as the new networks use 4G for initially establishing the connection with the cell, as well as in locations where 5G access is not available. 5G can support up to a million devices per square kilometer, while 4G supports only up to 100,000 devices per square kilometer.

About the Speaker

Ramakrishna Pamidimukkla is the CEO of India Mobile Congress (IMC) since February 2017 and he has been the Principal Advisor to COAI since 2013. He has been the CEO and Co-Founder of Mpraxis Technologies Pvt Ltd since 2006. He obtained his BE degree from Malnad College of Engineering, Hassan which is affiliated to University of Mysore. Ramakrishna has been successful in making IMC, not just an event, but a trendsetter in networking and business opportunities, new product launches and emerging trends in technology.

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"Communication Protocol standards for IOT"

Dr. T.V. Prabhakar
Principal Research Scientist
Department of Electronic Systems Engineering, IISc, Bangalore

Abstract:
In this talk we will look at the suitability of IoT protocols (Publish - Subscribe and REST architectures) to energy constrained nodes. We will take case studies to show their suitability to a specific scenario. The compromises that follow and the loss of functionality will be discussed. We will then look at BLE mesh protocol and its ability to remain under low power. Furthermore, LPWAN protocols such as NBIoT's ability to offer long battery life will be highlighted. Finally, new and upcoming modifications to Wi-Fi protocol such as on-off noise power communication and its ability towards long distance communication will be discussed.

About the Speaker:
Prabhakar T Venkata works as a Principal Research Scientist in the Department of Electronic Systems Engineering, IISc, Bangalore. His broad area of interest is in Networked Embedded Systems. His group looks at Tactile applications, localization algorithms, energy/power management algorithms, algorithms for speech to text-based actuation, IoT heterogenous networks, IoT device identification etc. The current application areas include CPS for airplane environment control systems and intelligent transportation. He holds a PhD from TUDelft.

"Functional Safety in Automotive 2.0 Era"

Mr. Prasanth Viswanathan Pillai,
Texas Instruments, Bengaluru

Abstract:
The increasing semiconductor consumption has been spurred by a revolution witnessed in the automotive industry. The integration of electronics and networking into conventional automobile driven by infotainment and ADAS a few years back is accelerated by megatrends of EV/HEV, autonomous driving and shared mobility. These trends, termed sometimes as *Automotive 2.0*, drive various requirements into the semiconductors being sourced. Of these, safety is becoming paramount due to their impact and liability. This talk leverages the author's experiences in driving safety as a part of semiconductor development cycles. By breaking down complex system requirements into foundational ones, the tutorial is intended to provide an accessible treatment of the subject.

Keywords: Automotive, Electrical Vehicles, Safety, Automotive 2.0, ISO26262

About the speaker:
Prasanth joined TI in 2005 and works as Functional Safety Architect there. He is a TUV SUD certified Functional Safety Professional and is part of the United States Technical Advisory Group (USTAG) which undertakes the development and revision of ISO26262. He has six patents (granted/filed) and eleven IEEE conference presentations to his credit. He has given multiple talks internally and externally on functional safety, most recently invited talks/tutorials at ITC 2017, VTS 2017, ISO262626 conference 2018 and DATE 2019. He holds a Masters degree from Indian Institute of Science, Bangalore.

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"Inner Engineering and design challenges for current day electronic Systems"
by

Mr. SLN Murthy,
Principal Consultant, Wuerth Electronik India Pvt. Ltd, and
Member, IPC Advisory Committee, India

Abstract:

Design trends of current day electronic systems is to integrate multiple technologies into smaller physcical packages. Silicon technology is continual cramming of more transistors into chips, as predicted by Gordon Moore's Law. The devices are becoming faster and many products are being designed to fit into odd shapes or fit into whatever spaces that may available in existing devices. These requirements throw many challenges to the designers that include physical design, compliance to industry standards. Elctromagnetic compatibility, thermal management to nae a few. Faster data transfer standards like PCIe, SATA, HDMI are challenging the design of interconnect structure and build the Printed Circuit Board (PCB) which is the second level of packaging in any elctronic system.

Given that costs must be kept low in most instances, expensive connectors and complet board swaps are not the way forward, so what designers must be thinking when it comes to designing PCBs for such complex architectures?.

Product design requirements must address production challenges and compliance requirements. This is seldom conceived at the design stage and results in long delays in volume production, if not properly addressed.

In this short talk, an overview of the challenges to be addressed at design, photo-build and production release stages is presented.

About the Speaker:

Mr. S.L.N. Murthy obtained a Bachelor's degree in Electrical Engineering from Mysore University in 1966, a Bachelor's degree in Electrical Communication Engineering from Indian Institute of Science, Bangalore in 1967 and a Master's degree in Electronics from

Indian Institute of Science, Bangalore in 1969. He has a total professional experience over 42 years in system design, PCB, SI and PI by working at several prestigious organizations such as a faculty member of ECE department at Indian Institute of Science - Bangalore by teaching digital electronics as well as electrical engineering during 1969-71, BEL in various capacities in the R & D department developing embedded systems and setting up India's first PCB CAD Centre that supported Defense and Space Electronics during 71-89, as CTO of a Co-founded electronic system design engineering company providing solutions to Indian defense research laboratories and ISRO during 1989-95, as Promoter, CEO & MD of ECAD Technologies as a premier electronics engineering solutions company to address simulation driven "First time Right Design" approach in designing electronic systems (venture funded and acquired by a AT&S Limited, Austria in 2005) during 1995 – 08, as CTO of Tessolve Services the first semiconductor test engineering services company in India during 2008 – 11, CTO of Trident Technlabs Pvt Ltd, a software solution marketing group in system engineering space during 2011-13, Developing solution team to address PCB design engineering and Signal/Power Integrity aspects at ASM Technologies Ltd. During 2013-14, and Principal Consultant at Wuerth Electronik India Pvt. Ltd, building an engineering team in Engineering, Package Design and System design from 2014 till date.

He has been a Senior Member IEEE, Vice-Chair IEEE EPS, ESDA Managing Committee member, IEEE EPS Chapter Vice-Chairman, Life Member IMAPS, Life Member CSI, Member IPC Advisory Committee. He has been on organizing and program committees of many international and national conferences, workshops. Latest being IEEE EDAPS in Dec 2018. He authored a number of papers in national & international conferences as well as user group meetings.

The Shift - Regulation and Policy follows Innovation

Mr. Gururaj U Nayak
Co-Founder and CEO
Qogno Digital Infrastructure Pvt. Ltd.

Abstract

The previous Industrial revolutions brought in their inventions along with standards and regulations. Hitherto we have witnessed many instances when, the government had led innovations introducing new policies and regulations alongside. There is a paradigm shift, **that innovations are calling for policies and regulations and are led by the governments.**

The changed scenarios of the next industrial revolution

- Real time control - Systems communicate and exchange information with each other and with humans in real time via the Internet of Things. it promises to merge the physical and the virtual world.

Role of private

- Private sector opens up a lot of opportunity to come up with disruptive ideas that contribute to the economy as well as to the maturing of the start-up eco system.

Role of governance

With **Make in India** as a rallying theme, we could also expect the digital manufacturing industry bloom to render India as next **Super power**. To mention a name, Ministry of Electronics & Information Technology (MeitY), Government of India is leading and facilitating a gamut of Innovation and 4IR related activities across the country towards expansion of this ecosystem.

Role of academia

- Academia, a vanguard of the 4IR and has a key role to play in catalysing the 4IR.

- Universities are already contributing through research on key technologies, including artificial intelligence, robotics, biotechnology and the cyber domain.

Role of citizens

- Citizens will have a lot to look forward to with innovations bringing change in their lifestyle, culture and the way we embrace technology with a progressive outlook.
- The society must feel empowered to take action and ensure that technology works for ALL of us.

Smart cities, digital village airports, Railway stations, will be the be examples of smart living enabled by Digital technology of the future.

An example of smart campus, as in smart college campus as a use case and case study.This smart campus would be one of the first of its kind in India to showcase the beginning of Industrial revolution 4.0

Qogno a shared digital infrastructure solutions provider, established in 2018 with the goal of building products and solutions to bridge the digital divide between urban and rural centres. The company's complete solutions offer a seamless and frictionless interface in the ecosystem involving the government, private partners and citizens and contributing to this Industry 4.0 with its future ready scalable, adaptable and modular solutions.

About the Speaker

Mr. Gururaj U Nayak is the Co-Founder and CEO of Qogno, a shared Digital Infrastructure solutions provider. At Qogno he is the product architect and chief vision curator who aims to take fourth industrial revolution by storm to create a more connected world.

With over 14 years of experience, Gururaj is passionate and deeply motivated about the work he undertakes so that it meets future demands with scalability. He is an alumnus of IIM-Kolkata and he began his journey as an entrepreneur with his first venture, GoingNuts, a patisserie and confectionary start-up while working parallely at Biocon. This was followed by second company, Papercats Creative Solutions that dove nose-first into the packaging industry. In 2015, he spearheaded the creation of a real-time governance system (instrumental in detecting exact location of Cyclone Fani to enable the relocation of citizens along with their valuable belongings by minimizing adverse impact on life, for government of Andhra Pradesh. This served as the springboard for him to set foot into the sphere of technology leading to inception of Qogno.

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"Data Standards for e-Healthcare"

Dr. Kavi Mahesh
Director, IIIT, Dharwad

Abstract:
Healthcare is undergoing major changes with the introduction of IT-enabled e-services in all its functions. This talk presents an overview of both global and national standards for representing and managing data and information in the healthcare industry. Some of the key standards to be introduced are HL7 (Health Level-7), MDDS-Health (Meta Data and Data Standards), ICD (International Classification of Diseases), LOINC (Logical Observation Identifiers Names and Codes), SNOMED CT (Systematic Nomenclature of Medicine-Clinical Terms) and UHID (Unique Health Identifier). The proposed National Digital Health Blueprint will also be discussed along with the evolving architecture for Health Information Exchanges at state and national levels.

Brief Profile of the Speaker
Dr. Kavi Mahesh is the Director of the Indian Institute of Information Technology, Dharwad. Previously, he was the Dean of Research at PES University, Director of the World-Bank funded Research Centre for Knowledge Analytics and Ontological Engineering – KAnOE and a Professor of Computer Science. His areas of interest are knowledge management, analytics, epistemology, ontology, classification studies, text processing and unstructured data management. He has three US patents and has published two books, 16 book chapters and 80 papers which have received over 1300 citations with a h-index of 20, i10-index of 28 and a g-index of 35. Notable among these are the textbook Theory of Computation: A Problem-Solving Approach (Wiley India, 2012) and Ten Steps to Maturity in Knowledge Management (Elsevier Pub. UK, 2006). He was earlier with Oracle Corporation, USA and New Mexico State University and has consulted in the area of Knowledge Management with Infosys, Hewlett Packard, United Nations and EasyLib.com. He holds an M. Tech. in Computer Science from the Indian

Institute of Technology, Bombay (1989) and an MS (1991) and a PhD (1995) in Computer Science from Georgia Institute of Technology, USA.

"Satellite Communication Standards"

Prof. V. Sambasiva Rao,
Director, CORI, PES University, Bengaluru

Abstract

Satellites play a crucial role to improve lives in today's digital economy. Nearly every industry relies upon satellite technology in some way - from agriculture to banking to transportation. With the explosive growth of **wireless communications**, particularly TV & broadband services, the availability of radio frequencies that can be operated free from harmful interference has become a big issue. Exploration of global solutions has become essential to address the need for additional radio spectrum allocations and harmonized standards to improve interoperability.

The organization responsible for international administration of geosynchronous orbital slots and frequencies for all satellite communications is the **International Telecommunication Union (ITU),** a specialized agency of the United Nations. ITU's **Radio communication Sector (ITU-R)** coordinates the vast and growing range of radio communication services, as well as the international management of the radio-frequency spectrum and satellite orbits. The Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the associated satellite orbits (both geostationary and non-geostationary), on the one hand allocate specific frequencies for various space applications, and on the other hand, contain detailed technical provisions and regulatory procedures to ensure the rational, equitable, efficient and economic use of spectrum/orbit resources. The overall governing regulations for this kind of communication system is the ITU-RR Vol.1- 4.

Interoperability translates to flexibility, capability and access to additional resources with reduced risk, development time and project costs. Historically, joint missions have tight schedules right after kickoff which can only be met with standards prepared in advance that are more methodically developed for long-term benefits. **Consultative Committee for Space Data Systems (CCSDS)** an organization officially established by the management of member space agencies meets periodically to address data systems problems that are common to all participants, and to formulate sound technical solutions to these problems and produces international voluntary consensus standards.

CCSDS recommended standards (Blue Books) define specific interfaces, technical capabilities or protocols, or provide prescriptive and/or definitions of interfaces, protocols, or other controlling standards such as encoding approaches. The purpose of this Report is to provide an architectural overview of the space communications protocols recommended by CCSDS and to show how these protocols are used in space mission data systems. This Document lists the definitions and references; presents major features of the space communications protocols and shows some examples of how space communications protocols are used in space data systems.

The presentation briefly introduces the regulations of ITU and standards suggested by CCSDS for coordinated use of satellites and ground infrastructure.

About the Speaker

Dr. V. Sambasiva Rao is an engineering graduate from College of Engineering, Kakinada, (Andhra University) and obtained Ph.D from BITS, Pilani. For over 37 years, he had associated with ISRO in various capacities. He was responsible for the development of high bit rate data transmitters for all IRS series of satellites and various RF and microwave systems in S, C, X, Ku and Ka bands for IRS and INSAT missions. He was also associated with the planning of communication satellites and development of associated technologies. He superannuated as Dy. Director from ISRO Satellite Centre in June 2011 and joined PES Institute of Technology/PES University in Bangalore as a Professor in E&CE Department and also associated with Crucible of Research and Innovation. Carrying out various R&D activities including development of student satellite PISAT and established an S-band satellite control facility (Ground station) at PES University campus. Currently he is Director of Crucible of Research & Innovation. Also, heading a Centre for Research in Space Science and Technology for spearheading the development of nano satellites - RSATs. Dr. Sambasiva Rao is a Senior Member of IEEE, a Fellow of IETE, Member of IET, a Member of Astronautical Society of India, and Vice President of the Society for Small Satellite systems. He has received Distinguished Achievement Award from the Department of Space, NRDC Award 1994, IETE-IRSI (83) Award 2006, Team Excellence Award from ISRO and ASI-ISRO Award for 2007 from Astronautical Society of India. He has published 100 technical papers in national & international journals and symposiums.

BITES ANNUAL CONVENTION 2019

"Standards in Software Engineering"

Mr. Krishnaswamy Subbarao
Vice President, Global Head of Strategy & Products,
Infosys Finacle, Bengaluru

Abstract

Standards play a very important role in all engineering disciplines. Any manufacturing item in India has ISI mark as a compliance to standard. Compared to other disciplines software engineering is still an evolving engineering branch. Every day, we can see new language, new technology, and new innovation happening. The talk will cover how standards play a role in evolving software engineering

About the Speaker

Krishnaswamy Subbarao has a diverse professional experience of 27 years and contributes as head of product strategy and product management in Finacle. Prior to this he co-founded Practicworks, a niche advisory and consulting firm and was the CEO of EXILANT GmbH, a company focused creating products in the Industry 4.0 space using IOT. He has experience in driving transformational sourcing models, heading product engineering groups and managing large engagements. Krishnaswamy's sectoral experience extends across BFSI, Manufacturing, retail and logistics.

BITES ANNUAL CONVENTION 2019

“Collaboration for Innovation in Education”

by

Mr. Aniruddha Kannal

CEO, Xcelerator

Abstract

The world's going through rapid digitization. As the modern student evolves, education in general and the teaching learning process in specific is undergoing a digital transformation. Just like any other change this one too poses a few challenges and a slew of opportunities. Should we go off on our own tangents or should we collaborate to innovate? Do standards have a role in education, which has traditionally been a realm of the avantgarde and the mavericks?

About the Speaker

Ani Kannal is the co-founder and CEO of xcelerator. xcelerator is a skill augmentation and employability platform that helps higher education institutions improve learning outcomes and enhance industry outreach. Before xcelerator Ani was VP of engineering at Deloitte, responsible for their life sciences and healthcare product portfolio. He has an MS in Computer Science from Binghamton University and BE in Computer Science from MS University of Baroda.

"Ethernet in the world of Automotive and Industrial Electronics – Needs, Similarities, and Differences"

by

Ms. Gayathri Seshadri,
Texas Instruments, Bengaluru

Abstract:
This presentation emphasizes the need for telecommunication in automotive and industrial environments, and the currently available communication architectures. Our goal is to understand how Ethernet compares with these options. When selecting a communication architecture, considerations must be given to the specific application. We will discuss how IEEE standards for communication address the subtle differences in requirements posed by the target applications. Finally, we highlight the different Ethernet Physical Layer offerings, the features they support, and targeted applications.

Key words: Automotive Ethernet, Industrial ethernet, IEEE 802.3, OSI

***Biography*:** Gayathri Seshadri leads and manages the Ethernet Design Verification team at Texas Instruments India (Pvt) Ltd., Prior to being involved in the ethernet verification, she has been successfully leading verification teams working on Imaging and USB subsystems, High speed interfaces, DSP processor and subsystems, ARM based subsystems. She holds a Bachelors degree in Electronics and communication, from the University of Madras. While not at work, she loves to spend time with the family and she enjoys cooking.

BITES ANNUAL CONVENTION 2019

"BITES LIFETIME ACHIEVEMENT AWARD-2019"

Dr Srinivasan Ramani
Founder, National Centre for Software Technology (NCST)

Dr. Srinivasan Ramani is the Founder Director of CDAC-Mumbai (formerly NCST), an autonomous organization, under the aegis of the Department of Electronics and Information Technology (DeITY), Government of India. He was inducted into the **Internet Hall of Fame, a coveted honour,** at the Internet Society's 2014 Induction Ceremony held in Hong Kong for his pioneering efforts in enabling the growth, connectivity and use of Internet in India wherein he became the first Indian to receive this recognition.

He made significant contributions to the creation and development of the Indian academic network, ERNET and the Bombay Library Network, Bonet. He has also played a major role in the exploitation of VSAT Technology in India, which is now serving the Bombay Stock Exchange (BSE), encompassing over a thousand VSATs.

In recognition of his exemplary contributions to IT connectivity in India, the Board for IT Education Standards (BITES), as an expression of high esteem, humbly present Dr. Srinivasan Ramani the

"BITES LIFETIME ACHIEVEMENT AWARD – 2019"

on this day, 23 November 2019 (Saturday), at "BITES Annual Convention-2019" organized in association with BNMIT-Bengaluru and IIIT-Dharwad at BNM Institute of Technology, Bengaluru.

Prof. HP Khincha **Chair, Awards Committee**	**Sri. MN Vidyashankar** **Co-Chairman, BITES**	**Prof. KNB Murthy** **Chairman, BITES**

BITES ANNUAL CONVENTION 2019

"BITES LIFETIME ACHIEVEMENT AWARD-2019"

Dr. S. Sadagopan
Director, IIIT, Bengaluru

Prof. S. Sadagopan is very passionate about IT education and has been a pioneer in the application of technology that is beneficial to society. He brought IT education to the doorstep of society and made Bengaluru, in particular, a thriving hub for IT education leading to the growth of the IT Industry.

He continuously worked towards applying IT to solve industry problems and societal issues. In the area of advanced enabling technologies, Prof Sadagopan played a crucial role that helped the services industry to self-equip and meet global competition. He continues to be an inspiring leader and motivator for the development of new systems, processes and standards that enhance the efficiency and competitiveness of IT and ITES industry.

In recognition of his exemplary contributions to both academia and industry, the Board for IT Education Standards (BITES), as an expression of high esteem, humbly present Dr. S. Sadagopan the

"BITES LIFETIME ACHIEVEMENT AWARD – 2019"

on this day, 23 November 2019 (Saturday), at "BITES Annual Convention-2019" organized in association with BNMIT-Bengaluru and IIIT-Dharwad at BNM Institute of Technology, Bengaluru.

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BITES ANNUAL CONVENTION 2019

Brief Report about First BITES Annual Convention

BITES instituted annual convention from the year 2018 to deliberate on a theme which is relevant to its stakeholders. It is a 2-day annual event being organized at a member institution which is willing to host the convention. Starting from this year, BITES has also taken a step to present "BITES LIFETIME ACHIEVEMENT AWARD(s)" to exceptional individuals who have immensely contributed for the growth of IT sector and IT education.

BITES Annual Convention – 2018 with "New Paradigms in Higher Education" as its theme, in association with IIIT-Dharwad and BMS College of Engineering – Bengaluru, was held at BMS College of Engineering, Bengaluru during November 23-24, 2018. This convention broadly covered the topics pertaining to "Future of Education" and steps to be taken for Indian higher education to be relevant in the future. About 13 lectures were delivered by experts from academia, research organizations, and industry on topics such as Instruction in Digital Era, Modelling knowledge transfer in learning communities, The Future of Work and Implications for Higher Education, Building

Research Culture on Campuses, Future Work Skills, Assessment Design & Industry-relevant Competencies, Preparing for the industry, The Critical Role and Impact of Entrepreneurship Education, Telecom 2020 and Shocking Journey - Engineering Educator to Entrepreneur.

BITES, as an expression of high esteem, presented “BITES LIFETIME ACHIEVEMENT AWARD - 2018” to Professor V. Rajaraman for his immense contributions to IT education on November 24, 2019 at the valedictory function of the convention in the august presence of Prof. BS Sonde, Professor MN Channabasappa, Professor HP Khincha, Sri. MN Vidyashankar, and Professor Kavi Mahesh.