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Book of Abstracts



IIIT - Dharwad

BITES Virtual Annual Convention
(Theme - IOT and Security)

And



Dayananda Sagar
University,
Bengaluru

November 20-21, 2020

Motto

**Helping to keep
Karnataka at the
forefront of IT**

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**

The Focus of BITES

**is to create an effective IT eco-system
by networking industries, institutions,
Government, Faculty and students on a
voluntary and self-financing basis**

**Board for IT Education Standards (BITES)
IIIT-B Campus, Electronics City
Bengaluru – 560 100
www.bites.org.in**

Board for IT Education Standards (BITES)
in association with
IIT – Dharwad
and
Dayananda Sagar University, Bengaluru

Organized
BITES Annual Convention – 2020
(Theme – IOT and Security)

November 20-21, 2020

hosted at
Dayananda Sagar University, Bengaluru

About the Theme – “IOT and Security”

Internet of Things (IoT) is a unified concept of embedding and networking devices, data, and information for novel applications with higher level of accessibility, integrity, availability, scalability, confidentiality, and interoperability. In view of increased application base of IOT, providing security is a challenging task on account of vulnerability and heterogeneity of devices as well as Information Communication Technologies (ICT). The purpose of this convention is to provide insights into the key challenges in building IOT based systems and combating the risk of harm caused by these systems. IOT based systems consist of edge devices, communication network, and cloud storage with control circuitry which involve device security, data security and protection of privacy.

About Board for IT Education Standards (BITES)

BITES is an autonomous body promoted by the 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 Dayananda Sagar University (DSU), Bengaluru

Dayananda Sagar University (DSU) is a State Private University located in Bengaluru, India with "Diligence", "Service" and "Uniqueness" as its core values. DSU was established by the Mahatma Gandhi Vidya Peetha (MGVP) Trust, founded by late Sri. Dayananda Sagar, under the provisions of Government of Karnataka Act No 20 of 2013 and opened its academic programs in 2015. This University, envisioned as a research and innovation focused institute of higher education and learning, is a proud member of the Dayananda Sagar Institutions (DSI) family. DSU

is progressing under the guidance and nurturing of its Chancellor Dr. Hemachandra Sagar and Pro Chancellor Dr. Premachandra Sagar. DSU has been established, on a sprawling campus of 120 acres on Kanakapura Road in the vibrant city of Bengaluru, with the sole purpose of offering high quality education at affordable costs by providing world-class infrastructure, dedicated qualified faculty, employability oriented curriculum and ample opportunities for learning to become competent professionals in their fields of specialization. It has established eight innovation labs namely GE Advanced Healthcare Lab, Dassault Systems - AE Lab, BOSCH Rexroth: Automation Technologies, IBM Software for Emerging Technologies, NVIDIA: Boston Innovation Lab, ETAS: Automotive System Labs, Autodesk: Design & Innovation Centre, and VMware IT Academy jointly with reputed aforementioned industries to train the faculty and students on latest technology domains in terms of skills, knowledge and research applications. In addition, DSU has set up Dayananda Sagar Entrepreneurship Research Business Incubator (DERBI) and Atal Incubation Centre (AIC), with the support of Government of India, to encourage entrepreneurship and innovation in DSU as well as in the country. Within a short span of 5 years, DSU has been recognized as one of progressive private universities in the State of Karnataka and India. At present, DSU offers 31 UG and PG programs in addition to PhD programs in the arenas of Engineering, Commerce and Management, Basic and Applied Sciences, Health Sciences and Arts and Humanities. DSU has launched a School of Medicine titled “Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research (CDSIMER)” from the academic year 2020-21.

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

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.



BITES ANNUAL CONVENTION - 2020

(Theme – IOT and Security)

November 20-21, 2020

Dayananda Sagar University

Kudlu Gate, Hosur Main Road, Bengaluru – 560 068

PROGRAM SCHEDULE

Day-1 (November 20, 2020) Friday

Inauguration		
1	09.30 AM - 09.35 AM	Invocation
2	09.35 AM - 09.40 AM	Welcome by Dr. A. Srinivas, Dean – SOE, DSU
3	09.40 AM - 09.50 AM	About BITES and Annual Convention by Dr. KNB Murthy, Chairman, BITES and VC, DSU
4	09.50 AM - 10.05 AM	Inaugural Address by Prof. H.S. Jamadagni, Former Professor, IISc
5	10.05 AM - 10.10 AM	Vote of Thanks by Sri. M.N. Vidyashankar, Co-Chairman, BITES
	10.10AM - 10.30 AM	Break
6	10.30 AM - 12.00 Noon	Keynote address on Moushik: An Indigenous RISC-V Microprocessor from the SHAKTI family - IIT Madras by Prof. V. Kamakoti, Professor, IIT Madras.
7	12.00 Noon - 1.00 PM	Data in AI and ML: Privacy and Abuse issues by Prof. H S Jamadagni, Professor, IISc Bengaluru
	01.00 PM - 01.45 PM	Lunch
	01.45 PM - 02.00 PM	Music Interlude
8	02.00 PM - 02.45 PM	Industrial IoT - Construction of a Digital Twin by Dr. T V Prabhakar, Principal Research Scientist, IISc, Bengaluru.
	02.45 PM - 03.00 PM	Break
9	03.00 PM - 03.45 PM	Cyber Security: End User Awareness and Man in the Middle Attack by Prof. Ram P Rustagi, Professor, KSIT, Bengaluru
10	03.45 PM - 04.30 PM	Applications for IoT to handle Covid crisis and for sustainable income generation by Mr. Nataraj Kuntagod, Principal Director – R&D, Accenture Labs

BITES ANNUAL CONVENTION - 2020

(Theme – IOT and Security)

November 20-21, 2020

Dayananda Sagar University

Kudlu Gate, Hosur Main Road, Bengaluru – 560 068

Day-2 (November 21, 2020) Saturday

11	09.30 AM - 10.15 AM	Security at the Edge by Dr. Kalpesh Padia, Senior Software Engineer, eBay Inc.
11	10.15 AM - 11.00 AM	An Open ICT Architecture and a Data Exchange Framework for Smart Cities by Prof. Bharadwaj Amrutur, Professor, ECE, IISc, Chairman, Robert Bosch Center for Cyber Physical Systems & Research Head & Director, AI & Robotics Technologies Park
	11.00 AM - 11.30 AM	Break
12	11.30 AM - 12.15 PM	Cyber Security for Food Security by Mohan Satyaranjan, Entrepreneur, Founder CTO/Director, Taqanal Energy Pvt. Ltd.
13	12.15 PM - 01.00 PM	IoT and Healthcare by Dr. Raja N Moorthy, Former Managing Director of Kirusa Software India Pvt. Ltd., Bangalore
	01.00 PM - 01.45 PM	Lunch
	01.45 PM - 02.00 PM	Music Interlude
14	02.00 PM - 02.45 PM	AI infusion on IoT data in Enterprise Applications by Ms. Geetha Adinarayan, SRE Transformation Leader, AI Applications, IBM
	02.45 PM - 03.00 PM	Break
		Valediction
15	03.00 PM - 03.05 PM	Invocation
16	03.05 PM - 03.15 PM	Welcome and Introduction of dignitaries by Sri M.N.Vidyashankar, Co-Chairman, BITES
17	03.15 PM - 03.25 PM	About BITES Lifetime Achievement Award by Prof. H. P. Khincha
18	03.25 PM - 03.40 PM	Reading of Citations by Prof. Kavi Mahesh and Felicitation to the Awardee(s)
19	03.40 PM - 04.00 PM	Address by Awardee(s)
20	04.00 PM - 04.10 PM	Presidential Remarks by Prof SS Prabhu, Former Professor, IIIT-B
21	04.10 PM - 04.15 PM	Vote of Thanks by Dr. D. N. Sujatha, Executive Director, BITES

FOREWORD

Internet of Things (IoT) is a unified concept of embedding and networking devices, data, and information for novel applications with higher level of accessibility, integrity, availability, scalability, confidentiality, and interoperability. In view of increased application base of IOT, providing security is a challenging task on account of vulnerability and heterogeneity of devices as well as Information Communication Technologies (ICT). The purpose of this convention is to provide insights into the key challenges in building IOT based systems and combating the risk of harm caused by these systems. IOT based systems consist of edge devices, communication network, and cloud storage with control circuitry which involve device security, data security and protection of privacy.

Around 150 stake holders of BITES which comprises of faculty, students, researchers and industry professionals participated on both the days. This time BITES Lifetime Achievement Award 2020 was bestowed to the following for their exemplary contribution to the industry and society

- Dr. Gururaj Deshpande, Life Member, MIT and President and Chairman, Sparta Group
- Dr. Sridhar Mitta, Founder and Managing Director, NextWealth Entrepreneurs, Bangalore

In this post pandemic situation due to covid19, conducting virtual annual events have become a challenge, we are grateful to Dayanand Sagar University Management and Staff for organizing this event. My sincere thanks to the Speakers, Board Members, IIITD Staff, Institutional Members for making this event a success.

Professor K.N. Balasubramanya Murthy
Chairman, BITES and Vice-Chancellor, Dayananda Sagar University

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Sri Sudev Rao, CEO, Resolve India Pvt. Ltd., Bengaluru	
Invited Members	
Dr S G Diwakar, Former Scientific Secretary, ISRO HQ, Bengaluru	Prof. G Jagadeesh, Department of Aerospace Engineering, IISc, Bengaluru
Prof H S Jamadagni, Former Senior Professor, DESE, IISc, Bengaluru	
Special Invitees	
Prof. S. Sadagopan, Director, IIIT- Bengaluru	Prof. H.P.Khincha, Chairman – KSIC, Former VC-VTU and Former Professor - IISc
Sri. Aravind Srinivas, Practice Professor, DSU	Prof. S.S.Prabhu, Former Professor – IIT Kanpur and IIIT-Bengaluru

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23.	Adichunchanagiri Institute of Technology, P B No. 91, Adichunchanagiri Badavane Chikkamagalur-577 102	24.	BGS Institute of Technology BG Nagar, Nagamangala (Tq) Mandya - 571448
25.	Canara Engineering College, Benjanapadavu, ammunje Village, Bantwal-574 219	26.	GSSS Institute of Technology for Women KRS Road, Metagalli Industrial Area, Opposite to GSSS MBA, Mysuru, Karnataka 570016
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39.	Appa Institute of Engineering & Technology, Sharana Basaveshwar, Institune Complex, Brahmapur, Kalaburagi-585 103	40.	P D A College of Engineering, Aiwan-E-Shahi Area, Shambhognlli, Kalaburagi, Karnataka 585102
41.	Gurunanak Dev Engineering College Mailoor Road Bidar – 585 403	42.	SDMCE College of Engg. Dhavalagiri, Dharwad-580 002
43.	IIIT – Bangalore Electronics City, Hosur Road Bengaluru – 560 100	44	Sahyadri College of Engineering and Management, Mangaluru – 575 007
45.	A J Institute of Technology NH-66, Kottara Chowki Mangaluru – 575006	46.	IIIT-Dharwad 3rd floor, IT park, Hubli - Dharwad Hwy, Deshpande Nagar, Huballi-Dharwad, Karnataka 580029
47.	Bangalore Institute of Technology KR Road, Parvathipuram, Vishweshwarapura, Basavanagudi, Bengaluru, Karnataka 560004	48.	City Engineering College Kanakapura Rd, near METRO Station, Doddakallasandra, Bikasipura, Bengaluru, Karnataka 560062
49.	AMC Engineering College 18th K.M, Kalkere, Bannerghatta Main Rd, Bengaluru, Karnataka 560083	50.	Jyothy Institute of Technology Pipeline Rd, near Ravi Shankar Guruji Ashram, Thathaguni, Karnataka 560082
51,	K S School of Engineering and Management 15/3 Mallasandra Holiday Village Road, Off, Kanakapura Rd, Bengaluru, Karnataka	52.	Nitte Meenakshi Institute of Technology 6429, BSF Campus, Yelahanka, Bengaluru, Karnataka 560064
53.	Vemana Institute of Technology #1 Mahayogi Vemana Road, 3rd Block, Kormangala, Bengaluru-560034	54.	P.E.S. Institute of Technology and Management Sagar Road, Shivamogga 577204

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9.	Microsoft India	10.	TCS Limited

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“Moushik: An Indigenous RISC-V Microprocessor from the SHAKTI family”



Prof. V Kamakoti
Assoc. Dean- IC&SR
Professor, IIT Madras
Chairman, AI task force, Government of India

Abstract:

Microprocessors and microcontrollers form the core of electronic systems. Unfortunately, almost all the microprocessors and microcontrollers are imported, currently. Their designs are protected by patent with very strict licensing terms. SHAKTI is an open-source processor initiative by the Pratap Subramaniam - Center for Digital Intelligence and Secure Hardware Architecture - Reconfigurable Intelligent Systems Engineering (RISE) group at IIT-Madras. The SHAKTI Processor Program started as an academic initiative back in 2014; with the sole aim of building an open-source processor ecosystem which would not only be of industrial-grade quality but will also place India at the frontier of microprocessor research. Beyond these processors, the SHAKTI program today offers a complete software stack, FPGA prototypes, interconnect fabrics, accelerators, device IPs, verification suites, and much more all for free under permissive open source licenses. Till date, the SHAKTI initiative has seen three successful silicons (both indigenous and foreign manufactured), the latest being the completely Made in India MOUSHIK processor. In this talk, we will present an introduction to the SHAKTI class of processors with an emphasis on MOUSHIK, followed by a demo of an E-class IoT based weather station.

About the Speaker

Dr. V. Kamakoti is a Professor at the Department of Computer Science and Engineering at Indian Institute of Technology, Madras. Dr. V. Kamakoti has been appointed the Chairperson of Taskforce on Artificial Intelligence (Govt. of India) to explore possibilities to leverage Artificial Intelligence (AI) for development across various fields. He holds specialization in Software for VLSI, Reconfigurable Systems Design, and Computer Architecture. He has been working on various projects such as Microprocessor Development Programme, Graphics processing unit based parallel processing system for radar signal processing, Synthesizable models of digital design using the India VLSI design flow etc. His work has been reflected through his publications such as MLTimer: Leakage Power Minimization in Digital Circuits Using Machine Learning and Adaptive Lazy Timing Analysis, GANDALF: A Fine-Grained Hardware-Software Co-Design for Preventing Memory Attacks etc. He was awarded the Advanced Computing and Communications Society-CDAC foundation award in 2018, IBM Faculty Award in 2016, and DRDO Academy Excellence Award in 2013. He is also an independent Director in the board of City Union Bank since 2011 and a member of the Standing Technical Committee of National Stock Exchange.



Mr. Anand Kumar
Lead, Software Testing Shakti SoCs, IIT Madras

Abstract:

Microprocessors and microcontrollers form the core of electronic systems. Unfortunately, almost all the microprocessors and microcontrollers are imported, currently. Their designs are protected by patent with very strict licensing terms. SHAKTI is an open-source processor initiative by the Pratap Subramaniam - Center for Digital Intelligence and Secure Hardware Architecture - Reconfigurable Intelligent Systems Engineering (RISE) group at IIT-Madras. The SHAKTI Processor Program started as an academic initiative back in 2014; with the sole aim

of building an open-source processor ecosystem which would not only be of industrial-grade quality but will also place India at the frontier of microprocessor research. Beyond these processors, the SHAKTI program today offers a complete software stack, FPGA prototypes, interconnect fabrics, accelerators, device IPs, verification suites, and much more all for free under permissive open source licenses. Till date, the SHAKTI initiative has seen three successful silicons (both indigenous and foreign manufactured), the latest being the completely Made in India MOUSHIK processor. In this talk, we will present an introduction to the SHAKTI class of processors with an emphasis on MOUSHIK, followed by a demo of an E-class IoT based weather station.

About the Speaker

Mr. Anand Kumar, leads software testing for Shakti based SoCs. His areas of interest include test automation and IoT. He has more than twenty years of experience in developing network management solutions and test automation. At Rise lab, he works on creating IoT applications using Shakti processors.

“Industrial IoT - Construction of Digital Twin”



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

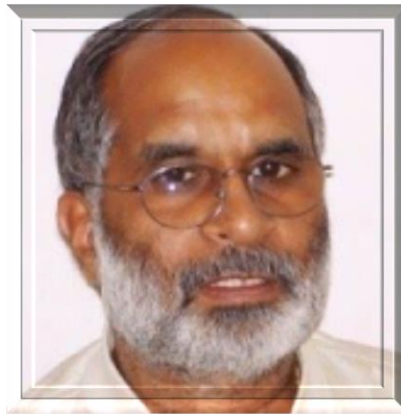
Abstract:

In this talk, we will first define the Digital Twin and follow it up by showing the process of building a Digital Twin from scratch. The key takeaway is that such systems can be built using free and open-source software. The application of interest is a temperature-controlled chamber. We will show one example of "what-if" analysis when temperature gradient is varied.

About the Speaker:

Dr. Prabhakar is a Principal Research Scientist at IISc. He works in Networked Embedded Systems where he focuses on hardware system design, micro energy harvesting systems and power management algorithms. Prabhakar leads the effort in Zero Energy Networks Laboratory (Zenlab) at DESE, IISc, where his PhD students, M.Tech students, Research Assistants and Interns work on building embedded electronic systems for application areas such as Airplane cabin, Industrial IoT, Air Quality, Tactile Internet applications, Autonomous drone charging systems, Machine Learning and AI for IoT applications. The laboratory has a well-equipped RFID laboratory where an object localization algorithm for RFID, IMU sensors is underway. His laboratory has published over 80 papers in IEEE and ACM conferences. The laboratory has received several 'best paper' awards including Mobicom 2020 work on energy-efficient algorithm for GPS on nano satellites. He is the Principal Investigator for MSME Centre of Excellence at IISc. He is currently working with about 100 MSMEs and facilitates funding and technical advice from IISc.

“Cyber Security: End User Awareness and Man in the Middle Attacks”



Dr. Ram P Rustagi
Professor, KSIT, Bengaluru

Abstract:

Man in the Middle Attack belongs to the category of cyber-attack where a hacker stealthily snoops and/or intercepts the communication between two communicating applications/systems. During an MITM attack, both the end user and web server remain unaware of such an attack. During the communication interception, hacker splits the user session into two sessions and acts as a proxy between the two sessions. Use of proxy enables the hacker to splice the two sessions and thus it can silently snoop/modify the data being exchanged. MITM attacks can play havoc for ecommerce transactions especially when the end user is under the false impression that the ecommerce site is providing secure communication.

In this talk, we discuss the underlying technologies that a hacker uses to carry out MITM attack and explore possible solutions that can be implemented to prevent the attack.

About the Speaker

Dr. Ram P Rustagi, is currently working as Professor, CSE dept., KSIT Bangalore, and honed up his academic skills with Ph.D. from IIT Delhi, and M.Tech from IISc Bangalore. Prior to KSIT, at Cavisson Systems, he mentored new technology development using Machine Learning techniques in Network Security and Performance Monitoring. At PES University, he brought innovations in teaching of computer network and security courses, and introduced practical experiential learning exercises. His previous engagements cover senior positions in engineering

in various startup technology companies in USA/India. The professional spectrum of 30+ years consists of Academic Institutes, and Technology start-ups as well as large companies. He is an invited speaker at IEEE workshops, FDP programs, peer reviewer and contributor to IEEE Conferences, ACCS magazines etc. He writes regularly for the technical journal Advanced Computing and Communications (<http://acc.digital>) published quarterly by ACCS, under the column Experiential Learning of Networking Technologies.

“Applications for IoT to handle Covid crisis and for Sustainable income generation”



Mr. Nataraj Kuntagod
Principal Director – R&D, Accenture Labs

Abstract

COVID 19 has changed the way we work and live drastically. The current talk focuses on general IOT trends and the application of IOT in two use cases – bringing resiliency to a large public feeding program, and how small holder aqua farmers can generate sustainable income using IOT/related technologies. The specific focus is on how COVID has impacted “business as usual”, and the re-imagination in the post COVID world, aided by technology.

About the Speaker:

Mr. Nataraj is presently the Principal Director, R&D at Accenture Labs. By blending design, technology and business, Mr. Nataraj is innovating for the "Next Billion" consumers. The R&D has won several “mobile for good awards”, opened up new market opportunities and revenue streams for our business and clients.

Nataraj has held several senior engineering and management roles at Motorola, Infosys and Accenture across US, Japan, UK and APAC regions. He had an entrepreneurial stint at bringing cost effective remote health monitoring products for emerging markets. Earlier at Motorola, he contributed to several industry first innovations - Satellite Communication System using Low Earth Orbit Satellites (IRIDIUM), Connected Car (MotoDrive) and Connected Health (MotoHealth).

He holds multiple patents in Wireless/IoT and has published in peer reviewed technical conferences and is a frequent speaker at industry events. Mr. Nataraj is a mentor to young entrepreneurs from Ashoka, NASSCOM, Industry Advisory Board member- IIIT-B and a Mentor of Change at Atal Innovation Mission.

“Security at the Edge”



Dr. Kalpesh Padia
Senior Software Engineer, eBay Inc.

Abstract:

Edge Computing, one of the hottest and fastest-growing trends in IT, finds its roots in the Content Delivery Networks and the P2P networks that were popular during the early years of this millennium. It takes the form of distributed IT architecture where data are processed near the data source or at the "Edge" of the network (hence the namesake Edge Computing). This is in contrast to the typical Cloud environment where data processing happens in a centralized data storage location. Still, it would be folly to think that the Edge can sustain on its own. The Edge is not a fixed place and it exists in conjunction with the Core. While the Edge serves as a point for data collection, processing, and presentation, the Core serves the purpose of long-term storage and retrieval and facilitates the communication between the different Edge nodes (devices).

The rapid increase in the rate at which data is generated today—1.7MB of data are created every second by each person today, or about 1PB of data every day by humanity—and the huge projected increase in this rate—about 463 exabytes of data every day by 2025—is the primary driver for shifting computing to the Edge. Further, processing and storing the data locally on the device allows for enhanced data privacy, provides autonomy by allowing services to be provided even when the Internet (or other network points) is temporarily unavailable, and reduces the latency of real-time response. This too has contributed to an increased interest in Edge Computing.

Based upon the above drivers, the most common scenarios where Edge Computing is now being deployed are autonomous transport, media and content delivery, smart homes, healthcare, lifestyle (smart cities, shopping malls, etc.), and factories and production facilities. The recent advancements in computing and networking hardware, along with software, have facilitated the shift from traditional computing models towards Edge Computing by making available power efficient, low latency, smaller and faster devices that can be easily deployed at the Edge. It is estimated that there are over 22 billion Internet of Things (IoT) Edge devices connected to the Internet today and this number will double before the end of the decade.

The deployment of billions of devices means that each of those devices is a potential entry point for hackers and security breaches. With at least 40% of IoT-created data now stored, processed, and analyzed closer to the Edge, it is critical to protect it from malicious attacks. Since the Edge is fluid and constantly changing, securing an Edge Computing infrastructure requires deploying defenses closer to the point of attack and farther away from the rest of the infrastructure. To adequately address threats an Edge Security model must protect against and provide countermeasures for attacks on the Edge, the Core, and the network links between the Edge and the Core.

Edge security can therefore be considered to comprise of (a) Perimeter security: securing access to devices both virtually via encrypted tunnels, firewall, and role-based access control, as well as physically; (b) Application security: securing applications running on the devices; (c) Threat detection: employing proactive threat detection technologies to identify potential issues early; (d) Vulnerability Management: managing both known as well as unknown vulnerabilities; and (e) Update cycles: automated patching of devices to reduce the potential attack surface. Recently, a new term has been coined to define a category of hardware and services that help enable Edge security based on the above factors: Secure Access Service Edge, or SASE (pronounced "sassy"). SASE combines the various WAN and Network Security services like Software-defined Wide Area Network (SDWAN), Cloud Access Security Broker (CASB), and Firewall as a Service (FWaaS), with Zero Trust Architecture into a single, cloud-delivered service model that provides end-to-end security.

Although SASE has emerged as a promising model to secure the Edge Computing infrastructure due to its flexibility, increased performance at reduced costs and complexity, and a zero-trust approach, several open challenges in securing the Edge itself remain. Some of these are: dealing with end-of-life devices and lifecycle transitions; verifying device behavior; ensuring adequate privacy protection and control; and protection against inventory and linkage attacks.

About the Speaker:

Dr. Kalpesh Padia grew up in Bhilai, the Steel City of India. He received his bachelor's degree in Computer Science and Engineering from PES Institute of Technology (now PES University), Bangalore. As a rising senior, his research in sensor networks earned him a summer research fellowship offered by the Computer Science department at Old Dominion University from where he later also received his master's degree in Computer Science.

He obtained his Ph.D. in Computer Science from North Carolina State University where he conducted research in data visualization, text analytics, and neural networks. For his dissertation, he developed a novel visualization technique to aid the understanding and exploration of various real and potential narrations within a story. He has published and presented his research at various venues and is a recipient of multiple patents.

Currently, he works at eBay in San Jose, CA, as a senior software engineer. His work there focuses on developing a cloud-native distributed firewall to protect edge workloads, designing new features for eBay Cloud, and creating visualizations for advanced data analytics. Alongside developing systems, Dr. Kalpesh also enjoys teaching and hopes to return to academia to teach someday.

“Industrial IoT - Construction of Digital Twin”



Dr. Bharadwaj Amrutur
Professor, IISc,
Chairman, Robert Bosch center, Bengaluru

Abstract:

We will describe our recent work in developing ICT reference architecture for smart cities, and a data exchange framework for IoT and non-IoT data, that is currently undergoing standardization in BIS (Bureau of Industrial Standards).

About the speaker:

Dr. Bharadwaj Amrutur is a Professor in IISc, Bangalore. He also chairs the Robert Bosch Centre for Cyber Physical Systems at IISc. He is also the Research Head and Director of ARTPark (AI & Robotics Technologies Park).

“Cyber Security for Food Security”



Mr. Mohan Satyaranjan
Entrepreneur,
Founder CTO/ Director, Taqanal Energy Pvt.Ltd.

Abstract:

9 Billion People will need to be fed sustainably by 2050. Technology is being increasingly used in every aspect of farming: Precision Agriculture, Farming Automation, Farm Management, Quality Control, Market Access, Logistics, Packaging & Preservation, Processing, Food Safety, Waste Processing, Preventing Food Loss, Detecting, and Preventing Frauds etc. All of these leverage the innovations in IoT, Machine Learning & Analytics, and Block chain technologies. A large number of mishaps have triggered research in identifying & addressing vulnerabilities, and risks in using technology in the food eco-system including Smart Farming. A huge amount of information is stored in the IoT systems, and hackers steal their raw data from their systems. Often, the notifications of malpractice are not available in real-time, and not enough forensics are available to analyze the vulnerability. Consequently, the benefits of introduction of technology get compromised, and the Return on Investment is low. It is important to do a security vulnerability assessment before introducing a new technology, and do a RoI analysis. There is need for extensive research, and development in the area of secure, smart, food eco-systems.

About the Speaker:

Mr. Mohan Satyaranjan is currently an entrepreneur focused on developing technology to address barriers to EV adoption. Prior to turning an entrepreneur, He has spent more than 35 years in Networking & Telecom R&D. He built ‘billion dollars a year’ product lines, from scratch, at both Cisco Systems, and Juniper Networks. He has held director, and above positions at NetApp, Juniper Networks,

and Cisco Systems. At Motorola he played a significant role in developing world's first GPRS capable subscriber device.

In the eighties, Mr. Mohan used to work in the area of 'Adaptive Control', and built some of the earliest neural-network based control systems. Mr. Mohan has also contributed in that domain of medical image processing. He obtained his Bachelors and Master's degree in EE from the Indian Institute of science, Bangalore. He underwent an Executive Management course at the Graduate School of Business, Stanford University. He is a Senior Member of the IEEE.

“IoT and Healthcare”



Dr. Raja N Moorthy
Former Managing Director, Kirusa-India, Bengaluru

Abstract:

The COVID-19 pandemic has changed virtually every facet of life. There is tremendous acceleration in digital healthcare particularly in touch less healthcare systems. Government of India’s initiative to provide health ID to all citizens would enable touch less/tap-and-go features, allowing patients to register themselves to see the doctor without a receptionist and based on the symptoms, a list of tests can be recommended and taken prior to seeing the doctor so that the doctor can take an informed decision in the first appointment itself.

Impetus for such acceleration emerges from the advances in Internet of Things backed with Cloud and Artificial Intelligence. Main concern using IoT in healthcare is that of confidentiality, authentication, privacy, access control and other security requirements. Multilevel encryption and other security features are needed to safeguard the data and information. Security control techniques affect the performance of IoT systems. Critical healthcare IoT systems cannot tolerate performance delays. There is a need to select and use the optimal, best performing algorithms. These security features encompass the entire IoT system components namely, IoT, data network, edge and cloud computing including the AI solutions. This session also uses Aarogya Setu the pandemic control app that is based on IoT and presents the security centric symbiotic relationship that exists between IoT, Cloud and AI, the opportunity that it creates to universities and entrepreneurs to take advantage of the ‘soon to be announced’ Healthcare Stack and Healthcare Interface to build touch less IoT based healthcare solutions including remote consultation, diagnosis, rehabilitation, fitness, and online pharmacy.

About the Speaker:

Dr. Raja N. Moorthy recently retired as the Managing Director of Kirusa, India and now an advisor to Kirusa. He was responsible for the India operations, specifically overseeing technical management, research and development.

Dr. Moorthy was also the Vice President of Engineering in Kirusa, Inc., NJ, and USA and led all aspects of the software development life cycle. With over four decades of extensive experience and expertise in the telecom industry, he has a proven track record of building teams that deliver innovative solutions in the market.

Before Kirusa, Dr. Moorthy was Chief Technology Officer at Zyglobe, a provider of end-to-end wireless solutions for businesses. Before this, Dr. Moorthy was Director of Engineering at Savera Inc., an innovator in web-based billing software for telecom and IP Carriers. Here he successfully led the development team to build a popular product still used in many European countries.

Dr. Moorthy holds a doctorate in Computer Science and Engineering from IIT Delhi, along with a master's degree in Computer Science from College of Engineering, Guindy, and Madras. He graduated from REC, Trichy with a degree in Electronics and Communication Engineering. He has 5 patents to his credit.

“AI infusion on IoT data in Enterprise Applications”



Ms. Geetha Adinarayan
SRE Transformation Leader
AI Applications, IBM

Abstract:

Infusion of AI on IoT data is making many of the dream use cases come true for manufacturing and facilities management industries. In this session, we will go over how AI infusion on large scale IoT data makes asset reliability use cases a reality and the value IoT and AI has added during COVID times for facility management use cases. We will also look at the importance of Edge in the context of IoT Data and AI.

About the speaker:

Ms. Geetha is an executive IT Architect with 20 years of experience in IBM. Currently she leads SRE transformation for IBM AI Applications. In her current role, she leads IBM Engineering and research data scientists in delivering AI based insights to large Enterprise Customers. As an Executive Architect, Ms. Geetha is responsible for the strategy and vision of SRE and Technology standards for TRIRIGA, Maximo, Engineering Lifecycle Management, Sterling and Weather solutions. Her initial years in Data Science focused on unstructured data analytics, big data and applying text analytics in the area of IT Operations Analytics. Ms. Geetha has made multi-million-dollar impact for IBM by leading work for large Enterprise customers in the area of performance Engineering and Enterprise Architecture. Ms. Geetha is a master inventor with 13 patents. In 2019, she received “Women in AI leadership” award by Jigsaw Academy. She was selected as “Women achiever” from CII (Confederation of Indian Industry) in 2011. Geetha holds B.S in Information systems from BITS Pilani.

“BITES LIFETIME ACHIEVEMENT AWARD-2020”



Dr. Gururaj Deshpande Life Member, MIT and President and Chairman, Sparta Group

Dr. Gururaj “Desh” Deshpande is a Trustee of the Deshpande Foundation and a Life Member of MIT Corporation at MIT. He is also the President and Chairman of Sparta Group LLC and the Chairman of Tejas Networks.

Dr. Deshpande’s entrepreneurial career spans the last three decades. He was involved as the founder, a founding investor, or chairman of several companies including Cascade Communications, Sycamore Networks, Coral Networks, Tejas Networks, Cimaron, Webdialogs, Airvana, Sandstone Capital, A123 Systems, and Curata.

The Deshpande Foundation, founded by Jaishree and Gururaj Deshpande, has supported sustainable, scalable social and economic impact through innovation and entrepreneurship in the United States, Canada, and India. In Karnataka, he set up Deshpande Startups and Deshpande Skilling Campus in Hubballi through which over 2500 youth from colleges in tier-2 cities and over 5000 rural children have been equipped with skills and resources to become successful professionals. Dr. Deshpande holds a B. Tech. in Electrical Engineering from the Indian Institute of Technology – Madras, an M.E. from the University of New Brunswick in Canada, and a Ph.D. from Queens University in Canada.

In recognition of his exemplary contribution to industry, academia and the society at large, the Board for IT Education Standards (BITES), as an expression of high esteem,

“BITES LIFETIME ACHIEVEMENT AWARD – 2020”

On this day, 21 November 2020 (Saturday), at “BITES Annual Convention -2020” organized in association with Dayananda Sagar University and IIIT-Dharwad.

Prof. HP Khincha Chair, Awards Committee	Sri. MN Vidyashankar Co-Chairman, BITES	Dr. KNB Murthy Chairman, BITES
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“BITES LIFETIME ACHIEVEMENT AWARD-2020”



Dr. Sridhar Mitta Founder and Managing Director, NextWealth Entrepreneurs, Bangalore

Dr. Sridhar Mitta’s 45 years of professional experience in IT industry can be summarized in three words: Technology. Business. Entrepreneurship. As the first employee of Wipro’s IT business and CTO for 20 years from 1980, Dr. Mitta spearheaded R&D in the IT industry. With his unique blend of R&D skills and business acumen, he pioneered product development services from India to global technology leaders.

Dr. Mitta is currently the Founder of NextWealth Entrepreneurs, Bangalore that helps its global clients to gain insights from their data by blending human touch with digital technologies. NextWealth is setting-up multiple delivery centers in small towns along with entrepreneurs, thereby providing employment for graduates, particularly girls. Dr. Mitta was also Founder of e4e in India that supported budding entrepreneurs from India to get access to famed Silicon Valley infrastructure in the US.

Dr. Mitta started his career at ECIL, Hyderabad as Technical Manager where he managed projects of national importance for defence and space departments. Dr. Mitta is associated with The Indus Entrepreneurs (TiE). He is engaged in advisory roles with many VCs, Government and start-ups.

Dr. Mitta received BTech from JNTU, MTech from IIT Kharagpur, MS and PhD from Oklahoma State University, US. He was later inducted into CEAT Hall of Fame at the same University.

In recognition of his exemplary contribution to the industry and society at large, the Board for IT Education Standards (BITES), as an expression of high esteem, humbly present Dr. Sridhar Mitta the

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Prof. HP Khincha Chair, Awards Committee	Sri. MN Vidyashankar Co-Chairman, BITES	Dr. KNB Murthy Chairman, BITES
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Brief Report about Second BITES Annual Convention

BITES instituted annual convention from the year 2018 to deliberate on a theme which is relevant to its stakeholders. BITES Annual Convention – 2019 with “Communication and Computing Standards” as its theme, in association with IIIT-Dharwad and BNM Institute of Technology, BSK II Stage, Bengaluru, was organized at BNMIT, Bengaluru during November 22-23, 2019. Ten lectures on topics such as Standards in Higher Education, Standards in 5G communication, Standards and Protocols in IOT, Standards in satellite Communication, and standards in Automotive Safety by experts from Industry and academia as well as research organizations. About 180 to 190 participants in the form of faculty and students from member institutions attended the convention.





BITES, as an expression of high esteem, presented “BITES LIFETIME ACHIEVEMENT AWARD - 2019” to Dr. Srinivasan Ramani former Director of NCST for his immense contributions to enabling connectivity as well as development of academic network ERNET and Prof. S. Sadagopan, Director of International Institute of Information Technology, Bangalore for his outstanding contributions to the growth of IT education on November 23, 2019 at the valedictory function of the convention in the august presence of Sri. Narayana Rao R Maanay, Professor MN Channabasappa, Professor HP Khincha, Professor G. Jagadeesh, Professor KNB Murthy, Professor Kavi Mahesh, Sri. MN Vidyashankar, Professor T.J. Ramamurthy, and Professor G.N.Krishna Murthy.

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” and “BITES FOUNDATION AWARD” 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.
