



# IETE Bengaluru Magazine

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## From the President's Desk

It gives me immense pleasure to note that IETE Bengaluru Centre has brought out and successfully published the 8th edition of its quarterly magazine. This quarterly magazine highlights the accomplishments and success of the Centre. The magazine not only gives an overview of the technical programmes organized by the Centre but also highlights its vision and future endeavors in the service of IETE members. Bengaluru is one of the most active centres of IETE and is devoted to further the cause of the Institution by contributing significantly towards the technological advancement of its members in South zone.



I am delighted to inform that IETE Bengaluru centre also bagged the best IETE centre award for the year 2020.

Recognized as a Centre of Excellence, IETE Bengaluru has been conducting many courses that benefit students, faculty and professionals. In addition to the Lectures by eminent scientists and engineers on technical topics, the Centre also organizes Courses, Workshops, Internship Programs and Week-end Programs on subjects such as IoT, AI & ML and other emerging technologies for Engineering Students. The Centre has also taken up many programmes for Women Empowerment including programs for rural women in remote areas.

I congratulate IETE Bengaluru Centre team on the successful release of the 8th edition of its quarterly Magazine and wish the Centre all the very best for all its future activities.

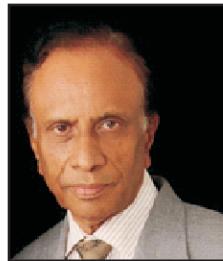


**Prof (Dr) J W Bakal**

President, IETE

## From the Chairman

Dear IETEian,  
I am happy that we have been able to bring forth this, the eighth, edition of your magazine on time in spite of the constraints imposed by the pandemic. The release coincides with the celebration of IETE Foundation Day which, for the first time, is being conducted in the virtual mode. We are honouring Senior Members of the IETE fraternity as well as winners of some IETE awards on this day. A brief report about IETE Awards finds a place in this issue.



As you might already know, your Centre has been adjudged as the Best Centre, 2019-'20, an honour we have received for the second time in a row. This will not make us complacent in any way, and we are committed to work harder to fulfill IETE's mission.

The festival season of the year has begun with Dussehra. I send my greetings of the season to all members including Organisational Members and well-wishers and thank them for their support and involvement in IETE's activities. We would greatly appreciate their critical appraisal and feedback about the Centre's work, and also, about this issue. All the Magazine issues are available on our website [www.ietebangalore.org](http://www.ietebangalore.org). We will respond to all suggestions and comments individually and try earnestly to live up to your expectation.

## C Satyanandan

Chairman, IETE Bangalore

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## From Hon. Secretary

It is my immense pleasure that we are back with the eighth issue of the IETE Bangalore magazine. This edition will be released on a special day - The IETE Foundation Day on 2nd November 2020. With the new Executive Committee several activities are been organized and more vibrant in its execution.

As quoted by John F. Kennedy, "**"Efforts and courage are not enough without purpose and direction"**" novel approaches are been explored to strengthen the labs of IETE Bengaluru Centre and to be in par with



the emerging technologies like Augment Reality and IOT. With the motto of striving for excellence by providing the quality training to all the stake holders the center is planning to collaborate with various Industries and strengthen the IOT lab with new tools.

The Magazine has been very instrumental in showcasing all the good work that we have been doing and exhibiting innovative technical articles which can pave the way to new research trends. I would appreciate your sincere feedback and suggestions in all our activities been conducted and making the Bengaluru Centre more proactive and accomplish the vision of the Centre.

### **Dr. S G Shivaprasad Yadav**

Honorary Secretary  
IETE Bangalore



### Welcome to Eighth Issue of *iete Bengaluru Magazine!*



I am glad to inform we have many good news to share in this issue! At the outset we are delighted to inform that IETE Bengaluru Centre has bagged the First Prize in Best Centre Award for 2019-2020. This is a remarkable achievement. Congratulations to then Chairman Prof H S Bhatia and the entire IETE Bengaluru team for their excellent and dedicated efforts. Other good news includes: Dr Surendra Pal, IETE

former President and a technical giant, receiving IETE Lifetime Achievement Award, I being elected as Vice President of IETE, Dr D C Pande as South Zone coordinator, Mr G Ramesh as Chair of Membership Committee and Dr D G Rao receiving IETE Gadhadhar Memorial Award. We have a sad news too, a huge loss to IETEB, demise of Sri A B Srinivasan who contributed immensely to IETEB. All these are covered in this issue.

The new IETE Governing Council (GC) for 2020-2021 under the leadership of Dr J W Bakal as the President, has taken over from 1st Oct 2020. We have included the new GC list in this issue for your reference. Congratulations to President & the new GC Members. We had published list of IETE Bengaluru Executive Committee list under Chairmanship of Mr Satyanandan, in the last issue. Now we have included a collage of all IETEB Executive Committee Member photos.

This issue also includes the standard features covering all the excellent technical and other activities done at IETEB under able stewardship of Chairman Sri Satyanandan and his team, technical articles by Mr Raj Kiran & Dr Kavitha, Tech Trends etc.

We would like to thank Mr Satyanandan for his immese support in bringing out this issue of the magazine, Mr Raj Kiran & Dr Kavitha for their technical articles. Our thanks are always due to Prof (Dr) J W Bakal, President IETE for his message, constant support & blessings. Thanks to all members of IETEB Magazine Editorial Board for contributions in bringing out this issue.

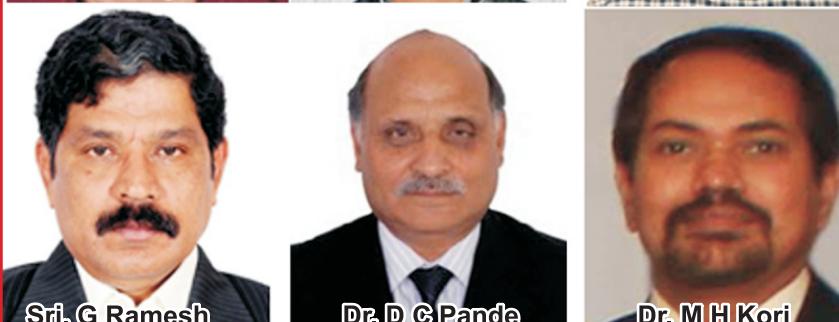
Thanks for your support and encouragement. Please send your views, suggestions and also be part of the magazine by contributing articles, news clips etc.

Thank You

### **Dr M H Kori**

On behalf of iete Bengaluru Magazine Editorial Board

<b>IETE Bengaluru Magazine Editorial Board:</b> Dr. MH Kori, Editor-in- Chief, Sri. C Satyanandan - Chairman, Magazine Committee Sri Ranjeet Kumar, Chairman, Finance Committee Dr. S Mohan Kumar, Member	Dr. S G Shivaprasad Yadav, Convener Dr. CV Ravishankar, Member Dr. E Kavitha, Member
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## IETE Governing Council 2020-2021

Prof (Dr) J W Bakal :	- President
Prof (Dr) K T V Reddy :	- Immdt Past President
Lt Gen (Dr) AKS Chandele, PVSM, AVSM (Retd) :	- Immdt Past President
Prof (Wg Cdr) P Prabhakar (Retd) :	- Vice President & Chairman(BoRIS)
Prof (Dr) A K Saini :	- Vice President & Chairman(PUBs)
Dr M H Kori :	- Vice President & Chairman(AC)
Shri Viney Kakkar :	- Hon'ry Treasurer & Co-Chairman (CAC)
Shri R K Vyas :	- Zonal Mentor (North) and Co-Chairman(AC)
Dr D C Pande :	- Zonal Mentor (South) & Co-Chairman (BoRIS)
Prof (Dr) Nilesh N Kasat :	- Zonal Mentor (West) & Co-Chairman (TPPC)
Shri Ajay Kumar :	- Zonal Mentor (East) & Co-Chairman (MC)
Prof (Dr) V Gunasekhar Reddy DIG (Retd) :	- Chairman (BoA)
Brig V K Panday (Retd) :	- Chairman (CCC)
Prof (Col) S L Kapoor (Retd) :	- Chairman (PARGC)
Wg Cdr K C Bhardwaj (Retd) :	- Co-Chairman (WEEC)
Prof M N Hoda :	- Chairman (TPPC) & Co-Chairman(PUBs)
Shri G Ramesh :	- Chairman(MC)
Dr. Shiv Kumar:	- Chairman (SDICC)
Maj I M Kapoor (Retd):	- Chairman (CAC)
Dr D K Lobiyal :	- Chairman(BoESA)
Gp Capt R C Goyal, VSM (Retd) :	- Co-Chairman (PARGC)
Dr Niranjan Prasad :	- Co-Chairman (SDICC)
Prof (Dr) Ashwini Kunte :	- Chairperson (WEEC)
Prof Baswaraj Gadgay :	- Co-Chairman(CCC)
Dr S Arivazhagan :	- Org Rep Member & Co-Chairman (BoESA)

### NOMINATED MEMBERS

Lt Gen (Dr) Rajesh Pant, PVSM, AVSM, VSM (Retd) - Co-Chairman(BoA)

Shri Bhuvansing A Damahe

Prof (Dr) Udhav V. Bhosle

### EX-OFFICIO MEMBERS – CHAIRMEN OF LOCAL CENTRES

Shri Satyanandan C	IETE Bangalore Centre
Dr Pramod Kumar Singhal	IETE Bhopal Centre
Shri Subhash Chander Jain	IETE Chandigarh Centre
Dr N Venkateswaran	IETE Chennai Centre
Shri Bharat Bhushan Rishi	IETE Delhi Centre
Shri K Gnaneshwar Rao	IETE Hyderabad Centre
Prof (Dr) Jyotsna Kumar Mandal	IETE Kolkata Centre
Shri Parag B Walunjkar	IETE Mumbai Centre
Col Ashok Kumar Bhanot, Veteran	IETE Noida Centre
Dr R D Kharadkar	IETE Pune Centre

## AN EVENTFUL QUARTER

i. An FDP was conducted by BMS Institute of Technology and Management on "Trends in Data Analytics" in association with IETE Bangalore from 10th to 14th August 2020. (Report in this issue)

ii. An online internship course on AI & ML was conducted from 31st August to 26th September 2020. (Report in this issue)

iii. IETE Bangalore conducted training courses for executives of BEL on the following dates:

2-5 September: Simulator Technologies in Strategic applications

9-12 September: Engineering of Radar Systems and its Challenges 16-19 September: Microwave Engineering and Antenna Technologies

iv. Engineers' Day was celebrated on 15th September 2020. (Report in this issue.)

v. A webinar "Smart Manufacturing Summit" was organized by Ms. Entraine Business Services on 15th October 2020 in which IETE Bangalore was an Association Partner. Shri. Kiran Kumar, Sales & Marketing Director, Entraine welcomed the speakers and delegates. Technical talks were delivered by representatives of various Business Organisations on subjects related to Digital Transformation and Industrial IOT.

Shri. Satyanandan, Chairman IETE Bangalore delivered a Keynote Address and familiarized the participants with the activities of IETE. He described the benefits that Corporate Members and Organizational Members can derive by joining IETE and appealed to the companies represented at the Summit to be part of IETE's efforts to promote advancement in Electronics, Telecommunications, Information Technology and allied fields.

vi. Mahanavami was celebrated on 24th October at IETE Bangalore as usual. Wg. Comdr. Parthasarathi Past GC Member performed the Pooja.



### ONE MONTH INTERNSHIP Program on "Artificial Intelligence and Machine Learning"

IETE Bangalore conducted an Internship program from 31st August to 26th September 2020.

#### Objectives of the Internship:

- To provide a platform for overall technical growth in the area of Electronics & Telecommunications
- To make student learn the review of literature and enhance the student's knowledge
- To provide an exposure of Multi-disciplinary approach in solving the problems/ case studies relevant to Artificial Intelligence and Machine learning
- To inculcate employer-valued skills such as teamwork, communications and attention among the students.
- To enhance the capability of report writing and presentation skills

#### Outcomes of the Internship

- Exposure on the recent developments and emerging technologies in the area of Electronics & Telecommunications
- Expertise on the analysis, design and implementation concepts in the area of Artificial Intelligence and Machine learning
- Proficiency on the tools used for problem solving skills by developing the algorithms or applications in the area of AI and ML
- Exposure to industry relevant interpersonal and professional skills such as communication, team work, leadership skills and time management.
- Capability of documentation, report writing following ethical practices and demonstrate good presentation skills

The Internhsip program was conducted on the theme "Artifical Intelleigence and Machine Learning", began

on 31st August 2020 and was inaugurated by the Chief Guest Ms. Manisha Sanal, Scientist, LRDE, DRDO. The inauguration began with a welcome address by the Honorary Secretary and Course Coordinator Dr. S G Shivaprasad Yadav. In his address he explained the importance of Internship and relevance of AI and ML, as most of the Industries are adopting AI and ML in the emerging applications. Around 25 students from various reputed institutions across Karnataka, notably, MSRIT, BMSCE and UVCE had enrolled for the program. The speakers were very experienced and experts from reputed Industries, academia and Defence Organizations. The program was fully focused on the Hands-on approach using various tools in the area of AI & ML.

Shri. C Satyanandan, Chairman IETE Bangalore addressed the participants and highlighted the efforts put in by IETE Bangalore to organize various activities in the areas of emerging technologies. He advised the participants to make use of the Internship program effectively and learn the concepts well.

The Chief Guest Ms. Manisha Sanal, Scientist, LRDE, then gave her talk explaining the importance of AI and ML in the industries and how they are effectively used in several applications with the help of several examples.

The Topics covered under this Internship program were Python programming, Statistics Essentials and Data Visualization, ML- Supervised and Unsupervised learning, Deep Learning, Natural Language Processing,

Computer vision, Recurrent Neural Networks, Reinforcement Learning and so on. Lots of case studies and application examples were discussed during the program.

The valedictory session was conducted on 28th September and two experts were invited as Chief Guest and Guest of honor. Mr VTSV, Vice President, 5G Wireless R&D at Radisys, Bangalore was the Chief Guest and delivered a technical talk on "AI & ML in 5G Applications", where he explained the recent developments in the area of 5G Mobile applications and how AI and ML is relevant in 5G. He also shared several challenges and example applications.

The Guest of Honor was Dr. Raghunandan Srinath, Principal Member of Technical Staff, Sensopt Technologies Pvt. Ltd, Bangalore. He also delivered a lecture on Machine learning and Artificial Intelligence in various applications like healthcare, retail market, automation, automotive and other areas. Both the lectures were very interesting and informative.

Shri Satyanandan, Chairman, IETE Bangalore in his presidential address complimented the resource persons and participants on the successful completion of the Internship Program and appealed to them to offer their suggestions and participate in all future activities of IETE Bangalore.

Dr. S G Shivaprasad Yadav, the Course Coordinator and Honorary Secretary, IETE Bangalore then presented the summary of the Internship program and thanked all the experts who shared their expertise in the program.

Maddali, Regional Vice President-region 5 CSI India.

Shri. Satyanandan briefed the audience about IETE activities and shared his perspectives on Data Analytics in Industry. Dr. Surendra Prasad Babu Maddali, introduced CSI and spoke about challenges in Data Analytics. The principal of BMSIT&M Dr. Mohan Babu G N spoke about the importance of Artificial Intelligence and Machine learning in the current situation and stressed on the job prospects in the field of Data Analytics. The vote of thanks was given by Dr. Sheela Kathavate, Associate Professor, Dept. of ISE. The FDP was attended by 47 participants from all over India.

The FDP was conducted by the experts from various Industries like Novo Nordisk Service Centre, Sakha Global Information Technology and faculty from

### **A Report on FDP conducted by BMS Institute of Technology and Management "Trends in Data Analytics"**

A one-week national level online Faculty Development Program on "Trends in Data Analytics" was conducted from 10th to 14th August 2020 by Dept. of Information Science and Engineering, BMS Institute of Technology and Management in association with IETE Bangalore and CSI Bangalore. It was inaugurated by the chief guest Mr. Pankaj Muthe, Academic Program Manager, Asia Pacific, Qlik.

Dr. Pushpa S. K, Professor and Head and convenor of the FDP welcomed the chief guest Mr. Pankaj Muthe and Dr. Mohan Babu G N, Principal BMSIT&M. She also welcomed and introduced the co-host Shri. Satyanandan, Chairman IETE Bangalore and Dr. Surendra Prasad Babu,

BMSIT. It was a well-balanced combination of both theoretical and hands-on approach.

The overall program was covered on the theme of Data Analytics. Some of the topics covered under this theme were Qlik, Data Analytics, Machine

Learning, Hand's on training using R/Python and Tableau, Machine Learning algorithms, Advances in Analytics, Data Visualization, Real life Applications of ML, Supervised Learning and Unsupervised Learning.

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### **A Report on Celebration of Engineers' Day, 15th September 2020**

The Engineers' day was celebrated by IETE Bangalore in the videoconferencing mode. A large audience attended the function.

The program began with an Invocation of Lord Ganesha by Dr. Parimala, Asst. Professor, MSRIT, Bangalore.

Dr. Shivaprasad Yadav Hon. Secretary, IETE Bangalore welcomed the audience and the Guest Speakers of the Day, and conducted the proceedings.

Dr. CV Ravishankar, Vice Chairman spoke on the life and work of Sir. M V Visveswarayya, on whose birth anniversary Engineers' Day is celebrated every year. He also shared slides on Sir Visveswarayya's achievements and contributions.

Dr. E Kavitha, Member, Executive Committee then introduced the Chief Guest Prof. S Chandrasekhar, Senior Prof & Director Business Analytic at IFIM Business School Bangalore. She read out the impressive CV of the learned Professor & Engineer.

Prof. S Chandrasekhar in his address dwelt on Artificial Intelligence- Past, Present and Future in an interesting way.

Talking of the history of AI, Prof. Chandrasekhar briefly touched upon the work of Indian, Greek and Chinese philosophers and their ideas about the process of human thought being 'machinized'. He mentioned Deductive Reasoning propounded by Aristotle and the origins of Algorithm.

He spoke about the developments in modern times including attempts in the fifties to create an 'artificial brain' and how the field of AI was made an academic activity. However, he said, scientists

underestimated the volume of data required. From 1974 with the emergence of Computers, AI made a comeback. After 2014 cost of Computers was coming down. He talked about IoT and advantages of Cloud Computing etc.

Prof. Chandrasekhar spoke about technologies for the future such as Blockchain which can be implemented using many languages. He advised IETE that when we set up new facilities, we should see that we replicate an industry environment in the lab. He also described the basics of Computer Vision and its applications, an interesting example being identification of a person at Immigration counter from a photograph taken years before. He advised that Sound Analytics be taught in engineering courses.

The professor also spoke about the limitations of AI, fixing responsibility for decisions and ethical aspects. Prof. Chandrasekhar opined that Natural Language Processing in Indian Languages is an area in which very little has been done and that IETE could focus on developing skills and infrastructure in this field. He concluded his lecture by advising the students to develop the quality of perseverance by emulating the great Sir MV.

Shri. CP Dwivedi, Vice Chairman then read out the profile of Dr. Mayukh Das, Senior Chief Engineer & AI/ML Research Scientist at Samsung R&D Institute Bangalore, who was the Guest of Honour.

Dr. Mayukh Das began his talk by thanking IETE for the opportunity to give a presentation on Engineers' Day. He gave a very informative lecture on the topic "AutoML: AI to design AI for Intelligent Devices". He highlighted the features of AutoML which is a very popular tool used in various industries in the area of Artificial intelligence based Intelligent devices. He gave various design examples and emerging applications in the new intelligent devices being released in the market based on AI. He also

highlighted various Engineering challenges currently existing which have to be addressed. The Neural architecture needed for the design of AI, along with its types and performance analysis in various use cases was well explained. He concluded his session requesting all the young engineers and researchers to contribute to the area of AI and provide novel solutions to the emerging research challenges. It was a very informative session.

At the end of Dr. Mayukh's presentation, Shri. Satyanandan, Chairman gave his Presidential Remarks. He gave a brief account of his conversation with the Honourable Guests and thanked them for accepting our invitation. He mentioned our efforts to expand the IoT Lab by including AR facility also and appealed for everyone's cooperation. Chairman touched upon other activities as well, including the online courses, women empowerment programs and publication of the quarterly Magazine.

Shr. Ranjeet Kumar, Hon. Treasurer proposed the Vote of Thanks in conclusion of the Engineers' Day Program.



Dr. Mayukh Das



Prof. S Chandrasekhar



IETE Bengaluru is very proud to announce many of its esteemed members have been honored with prestigious awards, have been elected to and have assumed important positions. We are proud of their achievements and congratulate them.

## 1. Dr Surendra Pal is conferred with IETE - LifeTime Achievement Award - 2020

Congratulations to **Dr Surendra Pal** (DF-062502L), Distinguished Fellow & Past President IETE on being selected as IETE's Life Time Achievement Awardee this year. This recognition is conferred on his multifarious accomplishments, which

extends beyond professional community. IETE takes pride in conferring the Institution's Life Time Achievement Award on him. His achievement are



innumerable to list here.

**Dr Surendra Pal** (FIEEE, FNAE, FNASC, FVEDA, Ch.Egr (UK), FIET, Dist, FIETE, MIAA), A Space Communication, RF, EM and GNSS EXPERT, Presently Dr. DS Kothari DRDO Chair, is Former: Vice Chancellor- Defence Institute of Advanced Technology-Pune, Prof. Satish Dhawan Professor, Senior Adviser-Satellite Navigation (ISRO) Bangalore, Distinguished Scientist, Associate Director, Chairman GAGAN-PMB & Prog. Director Sat.-Navigation-ISRO] PRESIDENT (2012–14)-Institution of Electronics & Telecommunication Engineers-India.

## 2. Dr M H Kori is elected as the IETE Vice President

Congratulations to **Dr M H Kori**, IETE Distinguished Fellow, for being elected to IETE Governing Council 2020-2023 and being elected as the Vice President of IETE for 2020-2021 and also Chairman of Academic Committee 2020 2021.



**Dr. M.H.Kori**, former Technical Director of Alcatel Lucent Technologies, is a leading Wireless & Mobile Telecommunication & RF expert, has more than 40 years experience in Telecom, RF, Microelectronics &

IT. His research, industrial and academic experiences include work at Alcatel-Lucent Technologies R&D; C-DOT; Geosoft Technologies; DSQ Software; IIT Bombay; University of Duisburg, Germany; Validus Technologies USA, Consultant Telecom Standards Development Society India (TSDSI). He is a Distinguished Fellow of IETE. Dr Kori holds PhD from IIT Bombay.

### **3. Dr D C Pande is the IETE Zonal Mentor (South) & Co-Chairman (BoRIS)**

Congratulations to **Dr D C Pande** on being made Zonal Mentor (South) and also Co-Chairman of BoRIS Committee. Dr Pande is a renowned international expert in the domain of EMI & EMC. He is former Outstanding Scientist & Associate Director, Electronics & Radar Development Establishment (LRDE). He was involved in the Design & Development of Electromagnetic Interference Control Techniques for Ground Based, Airborne and Ship-borne equipment's and systems. Dr Pande is the former Chairman of IETEB.

### **4. Shri G Ramesh is the Chairman of IETE Membership Committee**

Congratulations to **Sri G Ramesh** on being made the Chairman of Membership Committee. Sri G Ramesh is an expert in the domain of Quality and presently is a Division Head at UR Rao Satellite Centre, ISRO. He has been serving ISRO/ISAC since 1983, and has made significant contributions

in the field of Quality Control, Quality Assurance, Project / Program Management and Indigenization etc. He was responsible for QA, in establishment of ASIC foundry (SITAR). He was a Project Manager RQA(E) SROSS-C2 Spacecraft and Electrical Systems in-charge ASTROSAT. He is also the former Chairman of IETEB.

### **5. Dr Govind Rao Doddamani has been awarded IETE - N V Gadadhar Memorial Award 2020-2021**

Congratulations to **Dr D G Rao** for receiving the N V Gadadhar Award. Dr D G Rao is a leading scientist / engineer in the domain of Radars and Signal Processing and senior scientist 'G' at LRDE and has made significant contributions in the field of Radars.

### **6. Sri. Viswam Gampala has been awarded IETE IRSI Main Scientist Award 2020**

Congratulations to **Sri Viswam Gampala** for receiving the IETE-IRSI Main Award. He is Outstanding Scientist - Sc "H" at LRDE DRDO Bangalore and lead the development of various Radars

### **7. Sri. Rahul Agrawal is awarded IETE-IRSI Young Scientist Award**

**Sri Rahul Agrawal** is Scientist 'D' at LRDE, DRDO, Bangalore and has made significant contributions in the development of Radars.

**IETE Bangalore wishes both continued and greater success & laurels to all of them!**

## **When Things get smarter**

By Rajkiran C,  
Head - IOT/AR Business, PTC India

The Internet of Things wave will fundamentally redefine the way business is done, the way consumers interact with their appliances and devices, and will end up making the world smarter and more efficient. Leading market-researcher Gartner says "...digital disruption is the single biggest challenge facing organizations today..."

Embarking on Digital transformation with the use of an IoT platform should have always been a priority for Manufacturers given the benefits of Cost

Reduction, Revenue increase and the improvement in Return of assets that it ensures.

However, with the current pandemic situation it is imperative for the businesses to adopt technology – To respond to the changed market needs in the short-term, To Operate in the "New normal" in the medium-term and To Thrive in the long-term.

An IoT platform that has the ability to extract data from different devices and systems, put them in the right context for analytics and machine learning, to recommend business process changes and to help create applications in quick time, is really the need of the hour.

So, how does IoT, or “smartifying a product”, help businesses? Let us take a closer look at the diagram below that depicts the business benefits –

The first key benefit is Product Intelligence: By attaching sensors and measuring relevant parameters of products like washing machines, air conditioners, stabilizers, pumps, motors or really any kind of devices/appliances in the field, manufacturers get real-time visibility into its current state and can monitor its health on an ongoing basis. They can understand what consumer behavior causes changes in the performance of the product – positive or negative – and then can make appropriate design changes (Product innovation) to the product during the next release. Before the advent of IoT, the manufacturer could only get back in touch with the sold product when the consumer reports a failure of the device. Therefore, now for the consumer too, it results in a significant enhancement of customer experience because the manufacturer can estimate the failure of the product even before the machine fails (predictive maintenance). Consumers can also be given proactive best practice recommendations on the usage of the product etc.

In the previous era, for every small product failure that occurred, the consumer would call customer

care and request for a technician visit. The technician would make one visit to diagnose the issue and probably another to replace the spare part that he identified the failure of. It could have been something that could have been either by the consumer himself, or remotely by the technician over phone/web, or could have been managed by a single visit by the technician. Service Optimization, therefore, is another key benefit of making products smarter.

Coming to the business topic of Product Innovation – as mentioned above, when products give out real-time information about their health during its functioning, manufacturers have the data and the intelligence to make decisions about design changes in future product releases based on its behaviour and also release new and innovative revenue models that make sense for the customer. For example: ‘Product-As-A-Service’ is a concept where a consumer could just rent a few appliances and pay per the number of hours used which could be lower than owning the product itself.

All-in-all, the IoT revolution will change forever the way the businesses are run and consumers interact with their devices and realise efficiencies in cost and performance that we never thought we could!

## AN INSIGHT INTO NATIONAL EDUCATION POLICY – 2020

### PART-1 - Dr. E. Kavitha

A new era of education is being EVOLVED thanks to the National Education Policy 2020.

Right from the primary education to the level of HEI(Higher Education Institutions) and research, the NEP 2020 makes a perfect roadmap with condemnable change and revolution in the conventional education methodologies followed.

The NEP 2020 is broadly classified into four parts

Part – 1: School Education

Part – 2: Higher Education

Part – 3 : Other Key areas of focus

Part – 4 : Making it Happen.

The main objective of NEP is achieving the full human potential through education, by developing an equitable society , Access to quality education, leadership on the global stage.

It aims at “ensure inclusive and equitable quality



education and promote lifelong learning opportunities for all" by 2030 and thus achieving sustainable development goals by then.

This is the first policy in the 21st century which aspires at achieving SDG4 (Sustainable Development

Goal- 4) while building upon India's traditional and value system.

The previous education policies were devised in the years 1986, 1992 and 2009, and they aimed at Access and equity and Right to free and compulsory education.

#### School Education

The school education structure is divided such as  
5+3+3+4

Foundation + Preparatory + Middle + Secondary.

Foundation learning is formulated for early childhood care and education with emphasis on ability to read and write and perform basic operations with number. To achieve this a National Mission on formation literacy and numerals will be set up by the Ministries of human resource developments (MHR) on priority by 2025.

To curtail dropouts and ensure Universal access to Education at all levels the existing Sarva Siksha Abhiyan, Right to Education Act, Open and Distance learning (ODL) offered by National Institute of Open Schooling (NIOS, SIOS) etc., will be strengthened to provide holistic education to ensure Local Variations on account of Culture, Geography and Demographics and to allow alternative methods of Education, the requirements of schools will be less restrictive. Efforts will also be made for involvement of community and Alumni Volunteering for enhancing Learning Process.

# Tech Trends

Compiled by M H Kori

## 10 technology trends to watch in the COVID-19 pandemic

### 1. Online Shopping and Robot Deliveries

COVID-19 has transformed online shopping from a nice-to-have to a must-have around the world. Some bars in Beijing have even continued to offer happy hours through online orders and delivery. Online shopping needs to be supported by a robust logistics system. In-person delivery is not virus-proof. Many delivery companies and restaurants in the US and China are launching contactless delivery services where goods are picked up and dropped off at a designated location instead of from or into the hands of a person. Chinese e-commerce giants are also ramping up their development of robot deliveries. However, before robot delivery services become prevalent, delivery companies need to establish clear protocols to safeguard the sanitary condition of delivered goods.

### 2. Digital and Contactless Payments

Cash might carry the virus, so central banks in China, US and South Korea have implemented various measures to ensure banknotes are clean before they go into circulation. Now, contactless digital payments, either in the form of cards or e-wallets, are the recommended payment method to avoid the spread of COVID-19. Digital payments enable people to make

online purchases and payments of goods, services and even utility payments, as well as to receive stimulus funds faster. However, according to the World Bank, there are more than 1.7 billion unbanked people, who may not have easy access to digital payments. The availability of digital payments also relies on internet availability, devices and a network to convert cash into a digitalized format.

### 3. Remote Work

Many companies have asked employees to work from home. Remote work is enabled by technologies including virtual private networks (VPNs), voice over internet protocols (VoIPs), virtual meetings, cloud technology, work collaboration tools and even facial recognition technologies that enable a person to appear before a virtual background to preserve the privacy of the home. In addition to preventing the spread of viruses, remote work also saves commute time and provides more flexibility. Yet remote work also imposes challenges to employers and employees. Information security, privacy and timely tech support can be big issues. Laws and regulations must be updated to accommodate remote work – and further psychological studies need to be conducted to understand the effect of remote work on people.

#### **4. Distance Learning**

As of mid-April, 191 countries announced or implemented school or university closures, impacting 1.57 billion students. Many educational institutions started offering courses online to ensure education was not disrupted by quarantine measures. Technologies involved in distant learning are similar to those for remote work and also include VR / AR, 3D printing and AI enabled robot teachers. Concerns about distance learning include the possibility the technologies could create a digital divide. Distance learning could also create economic pressure on parents – more often women – who need to stay home to watch their children and may face decreased productivity at work.

#### **5. Telehealth**

Telehealth can be an effective way to contain the spread of COVID-19 while still providing essential primary care. Wearable personal IoT devices can track vital signs. Chatbots can make initial diagnoses based on symptoms identified by patients. However, in countries where medical costs are high, it's important to ensure telehealth will be covered by insurance. Telehealth also requires a certain level of tech literacy to operate, as well as a good internet connection. And as medical services are one of the most heavily regulated businesses, doctors typically can only provide medical care to patients who live in the same jurisdiction. Regulators, at the time they were written, may not have envisioned a world where telehealth would be available.

#### **6. Online Entertainment**

Although quarantine measures have reduced in-person interactions significantly, human creativity has brought the party online. Cloud raves and online streaming of concerts have gained traction around the world. Chinese film production companies also released films online. Museums and international heritage sites offer virtual tours. There has also been a surge of online gaming traffic since the outbreak.

#### **7. Supply Chain 4.0**

The COVID-19 pandemic has created disruptions to the global supply chain. With distancing and quarantine orders, some factories are completely shut down. While demand for food and personal protective equipment soar, some countries have implemented different levels of export bans on those items. Heavy reliance on paper-based records, a lack of visibility on data and lack of diversity and flexibility have made existing supply chain system vulnerable to any pandemic. Core technologies

of the Fourth Industrial Revolution, such as Big Data, cloud computing, Internet-of-Things ("IoT") and blockchain are building a more resilient supply chain management system for the future by enhancing the accuracy of data and encouraging data sharing.

#### **8. 3D Printing**

3D printing technology has been deployed to mitigate shocks to the supply chain and export bans on personal protective equipment. 3D printing offers flexibility in production: the same printer can produce different products based on different design files and materials, and simple parts can be made onsite quickly without requiring a lengthy procurement process and a long wait for the shipment to arrive. However, massive production using 3D printing faces a few obstacles.

#### **9. Robotics and Drones**

COVID-19 makes the world realize how heavily we rely on human interactions to make things work. Labor intensive businesses, such as retail, food, manufacturing and logistics are the worst hit. COVID-19 provided a strong push to rollout the usage of robots and research on robotics. In recent weeks, robots have been used to disinfect areas and to deliver food to those in quarantine. Drones have walked dogs and delivered items. While there are some reports that predict many manufacturing jobs will be replaced by robots in the future, at the same time, new jobs will be created in the process. Policies must be in place to provide sufficient training and social welfare to the labour force to embrace the change.

#### **10. 5G and Information and Communications Technology (ICT)**

All the aforementioned technology trends rely on a stable, high-speed and affordable internet. While 5G has demonstrated its importance in remote monitoring and healthcare consultation, the rollout of 5G is delayed in Europe at the time when the technology may be needed the most. The adoption of 5G will increase the cost of compatible devices and the cost of data plans. Addressing these issues to ensure inclusive access to internet will continue to be a challenge as the 5G network expands globally.

##### **The importance of digital readiness**

COVID-19 has demonstrated the importance of digital readiness, which allows business and life to continue as usual – as much as possible – during pandemics. Building the necessary infrastructure to support a

digitized world and stay current in the latest technology will be essential for any business or country to remain competitive in a post-COVID-19 world, as well as take a human-centred and inclusive approach to technology governance.

As the BBC points out, an estimated 200 million people will lose their jobs due to COVID-19. And the financial burden often falls on the most vulnerable in society. Digitization and pandemics have accelerated changes to jobs available to humans. How to mitigate the impact on the larger workforce and the most vulnerable is the issue across all industries and countries that deserves not only attention but also a timely and human-centred solution.

### What AI still can't do

Artificial intelligence won't be very smart if computers don't grasp cause and effect. That's something even humans have trouble with.

In less than a decade, computers have become extremely good at diagnosing diseases, translating languages, and transcribing speech. They can outplay humans at complicated strategy games, create photorealistic images, and suggest useful replies to your emails.

Yet despite these impressive achievements, artificial intelligence has glaring weaknesses.

Machine-learning systems can be duped or confounded by situations they haven't seen before. A self-driving car gets flummoxed by a scenario that a human driver could handle easily. An AI system laboriously trained to carry out one task (identifying cats, say) has to be taught all over again to do something else (identifying dogs). In the process, it's liable to lose some of the expertise it had in the original task. Computer scientists call this problem "catastrophic forgetting."

These shortcomings have something in common: they exist because AI systems don't understand causation. They see that some events are associated with other events, but they don't ascertain which things directly make other things happen. It's as if you knew that the presence of clouds made rain likelier, but you didn't know clouds caused rain.

Understanding cause and effect is a big aspect of what we call common sense, and it's an area in which AI systems today "are clueless," says Elias Bareinboim. He should know: as the director of the new Causal Artificial Intelligence Lab at Columbia University, he's at the forefront of efforts to fix this problem.

His idea is to infuse artificial-intelligence research with insights from the relatively new science of causality, a field shaped to a huge extent by Judea Pearl, a Turing Award-winning scholar who considers Bareinboim his protégé.

As Bareinboim and Pearl describe it, AI's ability to spot correlations—e.g., that clouds make rain more likely—is merely the simplest level of causal reasoning. It's good enough to have driven the boom in the AI technique known as deep learning over the past decade. Given a great deal of data about familiar situations, this method can lead to very good predictions. A computer can calculate the probability that a patient with certain symptoms has a certain disease, because it has learned just how often thousands or even millions of other people with the same symptoms had that disease.

But there's a growing consensus that progress in AI will stall if computers don't get better at wrestling with causation. If machines could grasp that certain things lead to other things, they wouldn't have to learn everything anew all the time—they could take what they had learned in one domain and apply it to another. And if machines could use common sense we'd be able to put more trust in them to take actions on their own, knowing that they aren't likely to make dumb errors.

Today's AI has only a limited ability to infer what will result from a given action. In reinforcement learning, a technique that has allowed machines to master games like chess and Go, a system uses extensive trial and error to discern which moves will essentially cause them to win. But this approach doesn't work in messier settings in the real world. It doesn't even leave a machine with a general understanding of how it might play other games.

An even higher level of causal thinking would be the ability to reason about why things happened and ask "what if" questions. A patient dies while in a clinical trial; was it the fault of the experimental medicine or something else? School test scores are falling; what policy changes would most improve them? This kind of reasoning is far beyond the current capability of artificial intelligence.

### Hyper-personalized Medicine

Novel drugs are being designed to treat unique genetic mutations.

Here's a definition of a hopeless case: a child with a fatal disease so exceedingly rare that not only is there no

treatment, there's not even anyone in a lab coat studying it. "Too rare to care," goes the saying.

That's about to change, thanks to new classes of drugs that can be tailored to a person's genes. If an extremely rare disease is caused by a specific DNA mistake—as several thousand are—there's now at least a fighting chance for a genetic fix.

One such case is that of Mila Makovec, a little girl suffering from a devastating illness caused by a unique genetic mutation, who got a drug manufactured just for her. Her case made the New England Journal of Medicine in October, after doctors moved from a readout of her genetic error to a treatment in just a year. They called the drug milasen, after her.

The treatment hasn't cured Mila. But it seems to have stabilized her condition: it has reduced her seizures, and she has begun to stand and walk with assistance.

Mila's treatment was possible because creating a gene medicine has never been faster or had a better chance of working. The new medicines might take the form of gene replacement, gene editing, or antisense (the type Mila received), a sort of molecular eraser, which erases or fixes erroneous genetic messages. What the treatments have in common is that they can be programmed, in digital fashion and with digital speed, to correct or compensate for inherited diseases, letter for DNA letter.

How many stories like Mila's are there? So far, just a handful.

But more are on the way. Where researchers would have once seen obstacles and said "I'm sorry," they now see solutions in DNA and think maybe they can help.

The real challenge for "n-of-1" treatments (a reference to the number of people who get the drug) is that they defy just about every accepted notion of how pharmaceuticals should be developed, tested, and sold. Who will pay for these drugs when they help one person, but still take large teams to design and manufacture?

## Anti-aging drugs

Drugs that try to treat ailments by targeting a natural aging process in the body have shown promise.

The first wave of a new class of anti-aging drugs have begun human testing. These drugs won't let you live longer (yet) but aim to treat specific ailments by slowing or reversing a fundamental process of aging.

The drugs are called senolytics—they work by removing certain cells that accumulate as we age. Known as "senescent" cells, they can create low-level inflammation that suppresses normal mechanisms of cellular repair and creates a toxic environment for neighboring cells.

In June, San Francisco-based Unity Biotechnology reported initial results in patients with mild to severe osteoarthritis of the knee. Results from a larger clinical trial are expected in the second half of 2020. The company is also developing similar drugs to treat age-related diseases of the eyes and lungs, among other conditions.

Senolytics are now in human tests, along with a number of other promising approaches targeting the biological processes that lie at the root of aging and various diseases.

A company called Alkahest injects patients with components found in young people's blood and says it hopes to halt cognitive and functional decline in patients suffering from mild to moderate Alzheimer's disease. The company also has drugs for Parkinson's and dementia in human testing.

And in December, researchers at Drexel University College of Medicine even tried to see if a cream including the immune-suppressing drug rapamycin could slow aging in human skin.

The tests reflect researchers' expanding efforts to learn if the many diseases associated with getting older—such as heart diseases, arthritis, cancer, and dementia—can be hacked to delay their onset.

## Climate change attribution

Researchers can now spot climate change's role in extreme weather.

Ten days after Tropical Storm Imelda began flooding neighborhoods across the Houston area last September, a rapid-response research team announced that climate change almost certainly played a role.

The group, World Weather Attribution, had compared high-resolution computer simulations of worlds where climate change did and didn't occur. In the former, the world we live in, the severe storm was as much as 2.6 times more likely—and up to 28% more intense.

Earlier this decade, scientists were reluctant to link any specific event to climate change. But many more extreme-weather attribution studies have been done in the last few years, and rapidly improving tools and

techniques have made them more reliable and convincing.

This has been made possible by a combination of advances. For one, the lengthening record of detailed satellite data is helping us understand natural systems. Also, increased computing power means scientists can create higher-resolution simulations and conduct many more virtual experiments.

These and other improvements have allowed scientists

to state with increasing statistical certainty that yes, global warming is often fueling more dangerous weather events.

By disentangling the role of climate change from other factors, the studies are telling us what kinds of risks we need to prepare for, including how much flooding to expect and how severe heat waves will get as global warming becomes worse. If we choose to listen, they can help us understand how to rebuild our cities and infrastructure for a climate-changed world.

## OBITUARY

**AB Srinivasan** (015089-F) passed away on 31st August 2020. He had an excellent academic record. He graduated from College of Engineering, Guindy and obtained Post graduation in Electronics Design Technology from Indian Institute of Science, Bangalore with distinction. He held various positions in Indian Railways, and served as Dean at Indian Railway Institute of Signal Engineering & Telecommunications (IRISET), Secunderabad. He was Chief Signal & Telecommunication Engineer at Chennai and Bengaluru before he retired.

Shri. Srinivasan made significant contributions to IETE Hyderabad and Bangalore Centres. He was Jt. Secretary at Bangalore during 2004-'06 and Honorary Treasurer during 2006-'08, 2010-'12 and 2014-'17 and Vice chairman 2017-'18.

A soft spoken person, Shri. Srinivasan was loved by all who knew him, and more particularly, members of IETE Bangalore. He was successful in motivating and helping IETE students.



**K Anand Kumar** (0134430-F) passed away on 12th August 2020, aged 74. He completed Grad IETE after BSc from Bangalore University, and passed M.Tech (Electronics) from GCT, Coimbatore. He worked at BEL, and thereafter ran a startup called PE Systems and moved to NSIC, Govt. of India, where he retired as CGM in 2006.

Shri. Anand Kumar was known for his innovative thinking and management skills.



**CONGRATULATIONS TO IETE BENGALURU FOR  
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