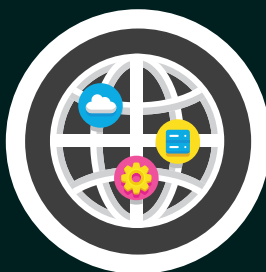




ICT ACADEMY  
**GLOBALTECHNOLOGY**  
FORUM 2020

14-18 October 2020

ISBN: 978-81-937760-7-0



# ICIHPE 2020

INTERNATIONAL CONFERENCE ON  
**ADVANCES IN IOT, HIGH  
PERFORMANCE AND EDGE  
COMPUTING**

## CONFERENCE PROCEEDINGS

Hosted by



**ICTACADEMY**  
OF TAMIL NADU

[gtf2020.ictacademy.in](http://gtf2020.ictacademy.in)



## CONFERENCE PARTNERS

### Under the Guidance of



Department of Information Technology  
Government of Tamil Nadu

### Supported by



Ministry of  
Electronics &  
Information Technology  
Government of India



Department of Science & Technology  
Government of India



NITI Aayog



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ENGINEERING INSTITUTIONS

## ABOUT ICT ACADEMY OF TAMIL NADU

ICT Academy of Tamil Nadu is an initiative of the Government of India, Government of Tamil Nadu and Industries. ICT Academy is a not-for-profit society, the first of its kind pioneer venture under the Public-Private-Partnership (PPP) model that endeavours to train the higher education teachers and students thereby exercises on developing the next generation teachers and industry ready students.

ICT Academy was started to meet the skill requirements of the industry and generate more employment especially in tier 2 and 3 towns, the rural parts of the country. The organization was formed with representations from the State Government of Tamil Nadu and leading companies in the ICT industry.

With training of teachers and students as the primary objective, ICT Academy has been working through a seven pillar program in the areas of Faculty Development, Student Skill Development, Entrepreneurship Development, Youth Empowerment, Industry-Institute Interaction, Digital Empowerment and Research & Publications.

ICT Academy has strives on every aspect to provide a holistic service to every stakeholder of the education ecosystem in developing the next generation of talent pool in India to make them industry ready employees, innovators, entrepreneurs and leaders.

Through its various initiatives, ICT Academy has been part of strengthening the India's four important visions on Skill India, Digital India, Startup India and Make in India.





## ABOUT GTF2020

ICT Academy promotes research activities by providing platform in the form of International Scientific Research Journals and Conferences for sharing the research outcomes in the areas of Information and Communication Technology. GTF2020 by ICT Academy hosted online through a virtual platform thereby providing opportunity to researchers from across the globe to participate and learn from the comfort of being at their place. The Online platform also helped cutting unnecessary costs and expenditures towards travel/stay for attending such global conferences. The Forum created access to expertise on range of topics with LIVE as well as recorded sessions for the future reference.

### GTF2020

#### Keynote Sessions

GTF2020 featured expert keynote sessions delivered by leaders and renowned experts across the globe, with a higher level of abstraction providing specific explanations, and applications to the participants on the theme of the conference. The keynotes provided deeper insights, knowledge and value to the participants.

### GTF2020

#### Tutorial Sessions

Expert Tutorial sessions was an integral part of Global Technology Forum 2020. Experts from across the globe submitted proposals on current and emerging trends related to the theme of GTF2020. It was intended to provide a high quality learning experience to the attendees who wish to learn new technologies. Expert tutorials were featured in the conference delivered by leading industry professionals and renowned academicians.

## Conference - Paper Presentations

GTF2020 hosted technical research paper presentations in each of the conferences by researchers, practitioners, scientists and academicians. Accepted papers were invited for presentation and are published in this Conference proceedings. The best papers selected from the presentations are being reviewed for publication in ICT Academy Journals, which are listed in Group I of UGC-CARE List.



## KEYNOTE AND TUTORIAL SPEAKERS



**Thiru R B Udhayakumar**  
Hon'ble Minister For Revenue  
Disaster Management & IT  
Government of Tamil Nadu, India



**Hans Raj Verma IAS**  
Additional Chief Secretary  
IT Department  
Govt. of Tamil Nadu, India



**Prof Jeffrey Ullman**  
Stanford University  
United States



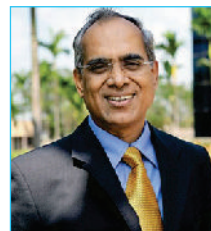
**Dr Rajendrakumar IAS**  
Additional Secretary Ministry  
of Electronics & Information  
Technology, Govt. of India



**Prof K K Aggarwal**  
Chairman  
National Board of Accreditation  
Government of India



**Prof Tarek Sobh**  
Lawrence Technological  
University, United States



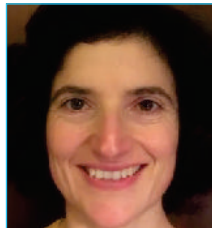
**Lakshmi Narayanan**  
Emeritus Vice Chairman, Cognizant  
Chairman, ICT Academy, India



**Prof Mufti Mahmud**  
Nottingham Trent University  
United Kingdom



**Prof Demetri Terzopoulos**  
Distinguished Professor and  
Chancellor's Professor of Computer Science  
University of California, United States



**Prof Elisabetta Comini**  
University of Brescia  
Italy



**Ramanan Ramanathan**  
Mission Director Atal Innovation Mission  
NITI AAYOG, Government of India



**Prof Mohamed-Slim Alouini**  
King Abdullah University  
of Science and Technology  
Saudi Arabia



**Sunita Sanghi**  
Principal Advisor, Ministry of  
Skill Development & Entrepreneurship  
Government of India



**Dr Tanya Morton**  
MathWorks  
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Vice Chancellor  
Anna university, India



**M Vijayakumar IAS**  
Managing Director  
Electronics Corporation of Tamil Nadu



**Dr Karisiddappa**  
Vice Chancellor  
Visvesvaraya Technological  
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**Pete Winn**  
Senior Research Advocate  
Oracle



**Dr Christian Hirst**  
Head - Political and Economic Sections  
Australian High Commission  
New Delhi



**H E Mohamed Maliki**  
Ambassador of His Majesty  
the King of Morocco to the  
Republic of India



**Chocko Valliappa**  
Vice Chairman  
Sona Group of Institutions  
Salem, India



**M Sivakumar**  
Chief Executive Officer  
ICT Academy, India



**Nikhil Bagalkotkar**  
India Technical Head & Strategy  
Autodesk



**Tmt P Ramana Saraswathi, IAS**  
Joint Director of e-Governance  
and Joint CEO  
TNEGA, Government of Tamil Nadu



**Prof Rajkumar Buyya**  
University of Melbourne  
Australia



**Dr Anbu Rathinavel**  
Chief Design officer  
Intellect Design Arena Ltd



**Prof Salil Kanhere**  
University of New South Wales  
Australia



**Kiran Jacob**  
Dassault Systemes



**Dr Ramesh Pudale**  
Autodesk



**Dr G Sainarayanan**  
General Manager  
Engineering and R&D Services  
HCL Technologies Ltd



**Dr Debanand Singdeo**  
MathWorks



**Ramana Anchuri**  
MathWorks



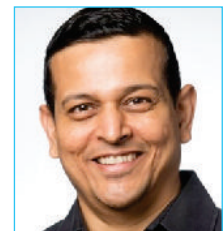
**Haridas Menon U**  
Head - HR  
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**Prof Bjoern Schuller**  
Imperial College of London  
United Kingdom



**Subodh Gajare**  
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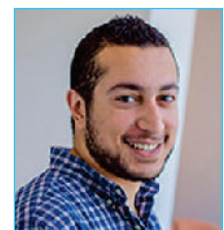
**Arjun Meda**  
Automation Anywhere



**Pramod Agrawal**  
Automation Anywhere



**Naga Chakrapani Pemmaraju**  
MathWorks



**Dr Mustafa Kishk**  
King Abdullah University  
of Science and Technology  
Saudi Arabia

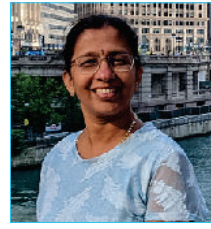




Anand Pujari  
Autodesk



Dr B Anbuthambi  
President  
ICT Academy



Bindu Nanjundaswamy  
Oracle



Dhiren Dutta  
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Shishir Laxminarayan  
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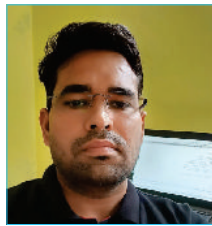
Shivaprasad A V  
Vmware



Ramya Victor  
Vmware



Chandana Radhakrishna  
Oracle



Rajendra Raghuvanshi  
Oracle



Badari Hiriyur  
Autodesk



Ranjani Swaminathan  
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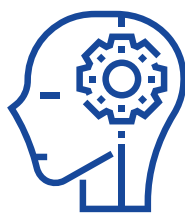
ICT ACADEMY  
**GLOBALTECHNOLOGY**  
FORUM 2020

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14 - 18 OCT 2020

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**5 DAYS**  
CONFERENCE SCHEDULE



**ICARA 2020**

INTERNATIONAL CONFERENCE ON  
**AI, ROBOTICS AND  
AUTOMATION**

**Day 1 : 14 October 2020 (Wednesday)**

**TIME (in IST)**

**AGENDA**

**GTF 2020 Inaugural Session**

*Opening Address*

09:30 am - 09:45 am

**Thiru Lakshmi Narayanan**

Chairman, ICT Academy & Emeritus Vice Chairman, Cognizant

*Special Address*

09:45 am - 10:00 am

**Thiru Hans Raj Verma IAS**

Additional Chief Secretary - IT Department, Government of Tamil Nadu, India

*Chief Guest Address*

10:00 am - 10:30 am

**Thiru R B Udhayakumar**

Hon'ble Minister for Revenue, Disaster Management & Information Technology  
Government of Tamil Nadu, India

*Vote of Thanks*

10:30 am - 10:40 am

**M Sivakumar**

Chief Executive Officer, ICT Academy

*Technical Keynote Session*

10:40 am - 11:15 am

**The Battle for Data Science**

Prof Jeffrey D Ullman, Professor (Emeritus), Computer Science, Stanford University, United States

*Tutorial Session I (Audi 1)*

**Reinforcement Learning for Autonomous Systems using MATLAB**

Dr Dhruv Chandel - Engineer, Education Team, Mathworks

Naga Chakrapani Pemmaraju - Senior Application Engineer, Mathworks

*Tutorial Session II (Audi 2)*

**Building RPA Bots with Automation Anywhere Enterprise A2019**

Pramod Agrawal - Vice President & Regional CTO, Automation Anywhere

Arjun S Meda - Senior Developer Evangelist, Automation Anywhere

*Tutorial Session III (Audi 3)*

**Explore limitless possibilities with Generative Design using Autodesk Fusion 360**

Dr Ramesh Pudale - Program Manager, Autodesk Education Experiences

Anand Pujari - Account Manager, Autodesk Education Experiences

Badari Hiriyur - Education Program Specialist, Autodesk Education Experiences

*Technical Paper Presentation*

01:45 pm - 03:45 pm

Track 1a: **AI in Healthcare**  
(Audi 1)

Track 2a: **Data Analytics**  
(Audi 2)

Track 3a: **NLP, Imaging and Computer Vision**  
(Audi 3)

03:50 pm - 05:20 pm

Track 1b: **AI in Healthcare**  
(Audi 1)

Track 2b: **Data Analytics**  
(Audi 2)

Track 3b: **NLP, Imaging and Computer Vision**  
(Audi 3) **Security & Automation**

*Evening Keynote Session*

05:30 pm - 06:00 pm

**AI in Engineering Education, Research and Industry**

Dr Tanya Morton, Director of APAC and EMEA Customer Success Engineering, Mathworks

06:00 pm - 06:30 pm

**Treating Neurodegenerative Diseases: A Neuronal Networks Decoding Approach**

Prof Mufti Mahmud, Senior Lecturer, Computing & Technology, Nottingham Trent University, UK

06:30 pm - 07:00 pm

**The Evolution of Design, how AI, ML and Robotics are changing the design processes in the Design, Manufacturing & Construction Industries**

Nikhil Bagalkotkar, India Technical Head & Strategy, Autodesk




# ICSCS 2020

INTERNATIONAL CONFERENCE ON  
SIGNALS, COMMUNICATION  
AND EMBEDDED SYSTEMS

Day 2 : 15 October 2020 (Thursday)

## TIME (in IST)

## AGENDA

### Opening Keynote Session

09:25 am – 09:45 am

**Prof K K Aggarwal**

Chairman, National Board of Accreditation, Government of India

09:45 am – 10:00 am

**Chocko Valliappa**

Vice Chairman & Trustee, Sona Group of Institutions, Salem, India

### Technical Keynote Session

10:00 am – 10:40 am

**What should 6G be?**

Prof Mohamed-Slim Alouini, Professor, Electrical and Computer Engineering, King Abdullah University of Science and Technology, Saudi Arabia

10:40 am – 11:15 am

**Blockchain for Cyber Physical Systems**

Prof Salil Kanhere, Professor, School of Computer Science & Engineering, University of New South Wales, Australia

### Technical Paper Presentation

09:30 am – 11:15 am

Track 1d: **AI in Healthcare and Industrial Applications in AI**  
(Audi 1)

Track 2d: **Data Analytics**  
(Audi 2)

### Tutorial Session I (Audi 1)

**Challenges and Solutions for Flight Duration Enhancement in UAV-enabled Wireless Networks: A Stochastic Geometry Perspective**

Prof Mohamed-Slim Alouini - Professor, Electrical and Computer Engineering, King Abdullah University of Science and Technology, Saudi Arabia

Dr Mustafa Kishk - Postdoctoral Research Fellow, King Abdullah University of Science and Technology, Saudi Arabia

11:20 am – 01:45 pm

### Tutorial Session II (Audi 2)

**Oracle Cloud : Provisioning Linux OS**

Bindu Nanjundaswamy - India Business Unit Head – Linux Support Delivery, Oracle

Anuradha Sharma - Country Manager, Oracle Academy Initiatives - South Asia

Shishir Laxminarayan - Technical Support Engineer, Oracle

Dhiren Dutta - Senior Technical Support Engineer, Oracle

### Technical Paper Presentation

11:20 am – 01:30 pm

Track 1e: **Industrial Applications in AI**  
(Audi 3)

01:45 pm – 03:45 pm

Track 1a: **Bio-Medical Imaging & Video Processing**  
(Audi 1)

Track 2a: **Communication Systems**  
(Audi 2)

Track 3a: **Wireless Communications & Networks**  
(Audi 3)

03:50 pm – 05:20 pm

Track 1b: **Bio-Medical Imaging & Video Processing**  
(Audi 1)

Track 2b: **Embedded Systems & its Applications**  
(Audi 2)

Track 3b: **Embedded Systems & its Applications**  
(Audi 3)

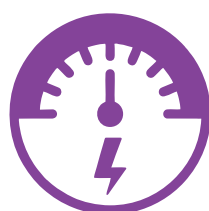
05:30 pm – 07:00 pm

Track 1c: **Bio-Medical Imaging & Video Processing**  
(Audi 1)

Track 2c: **Signals and its Applications**  
(Audi 2)

Track 3c: **Wireless Communications & Networks**  
(Audi 3)





# ICSEHV 2020

INTERNATIONAL CONFERENCE ON  
ADVANCES IN SENSORS, ENERGY  
AND HYBRID VEHICLES

Day 3 : 16 October 2020 (Friday)

## TIME (in IST)

## AGENDA

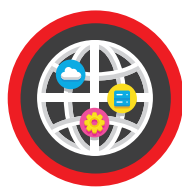
09:30 am – 10:10 am	<i>Opening Keynote Session</i>
	<b>Dr Rajendra Kumar IAS</b> Additional Secretary, Ministry of Electronics and IT (MeitY), Government of India
	<b>Kiran Jacob</b> Industry Process Consultant - Dassault Systemes India Pvt Ltd
	<b>Thiru M Vijayakumar IAS</b> Managing Director, Electronics Corporation of Tamil Nadu Limited, Government of Tamil Nadu, India

11:20 am – 01:45 pm	<i>Tutorial Session I (Audi 1)</i>
	<b>Modeling &amp; Simulation of Electrical Systems using MATLAB &amp; Simulink</b> Dr Debanand Singdeo - Technical Education Evangelist, Mathworks Ramana Anchuri - Education Technical Evangelist, Mathworks
	<i>Tutorial Session II (Audi 2)</i>
	<b>Virtualization 101</b> Shivaprasad Adampalli Venkateshappa, Staff Engineer, Vmware Ranjani Swaminathan, Senior Technical Staff, Vmware Ramya Victor, Senior Technical Staff, Vmware

01:45 pm – 03:45 pm	<i>Technical Paper Presentation</i>	
	Track 1a: <b>Industrial Energy Systems</b> (Audi 1)	Track 2a: <b>Sensors &amp; Applications</b> (Audi 2)
03:50 pm – 05:20 pm	Track 1b: <b>Industrial Energy Systems</b> (Audi 1)	Track 2b: <b>Hybrid Control for Autonomous Vehicle</b> (Audi 2)

05:30 pm – 06:15 pm	<i>Evening Keynote Session</i>
	<b>Metal Oxides Nanostructures for Chemical Sensing</b> Prof Elisabetta Comini, Professor of Physics, Director - Sensor Laboratory, University of Brescia, Italy
06:15 pm – 07:00 pm	<b>Recent Directions in Multidisciplinary Engineering Research and Education</b> Prof Tarek Sobh, Provost, Professor of Electrical and Computer Engineering, Lawrence Technological University, United States





# ICIHPE 2020

INTERNATIONAL CONFERENCE ON  
ADVANCES IN IOT, HIGH  
PERFORMANCE AND  
EDGE COMPUTING

Day 4 : 17 October 2020 (Saturday)

## TIME (in IST)

## AGENDA

	<i>Opening Keynote Session</i>
09:30 am – 10:05 am	<b>The Impact of Cloud in Research</b> Pete Winn, Senior Research Advocate, Oracle, Australia
10:05 am – 10:40 am	<b>AI and IoT for Digital Health</b> Prof Bjoern W Schuller, Professor of AI, Department of Computing, Imperial College London, UK
10:40 am – 11:15 am	<b>Neoteric Frontiers in Cloud and Edge Computing</b> Prof Rajkumar Buyya, Redmond Barry Distinguished Professor, University of Melbourne, Australia

	<i>Tutorial Session I (Audi 1)</i>
	<b>5G driving Massive IoT - Architecture and industry use cases</b> Subodh Gajare - Lead Architect, CISCO
	<i>Tutorial Session II (Audi 2)</i>
11:20 am – 01:45 pm	<b>Oracle Cloud: Setting up Web Server</b> Bindu Nanjundaswamy - India Business Unit Head – Linux Support Delivery, Oracle Anuradha Sharma - Country Manager, Oracle Academy Initiatives - South Asia Rajendra Raghuvanshi - Principal Technical Support Engineer, Oracle Chandana Ramakrishna - Technical Support Engineer, Oracle

	Technical Paper Presentation		
01:45 pm – 03:45 pm	Track 1a: <b>IoT Techniques and Applications</b> (Audi 1)	Track 2a: <b>IoT Techniques and Applications</b> (Audi 2)	Track 3a: <b>Edge and Cloud Computing</b> (Audi 3)
03:45 pm – 05:20 pm	Track 1b: <b>IoT Techniques and Applications</b> (Audi 1)	Track 2b: <b>IoT Techniques and Applications</b> (Audi 2)	Track 3b: <b>Cloud Computing Security</b> (Audi 3)

	<i>Evening Keynote Session I</i>
	<b>R Ramanan</b> Mission Director – Atal Innovation Mission, NITI AAYOG, Government of India
	<b>Deep Learning of Neuromuscular and Visuomotor Control of a Biomimetic Simulated Humanoid</b> Prof Demetri Terzopoulos, Distinguished Professor and Chancellor's Professor of Computer Science, University of California, United States
	<i>Evening Keynote Session II</i>
05:30 pm – 07:30 pm	<b>Sunita Sanghi</b> Senior Advisor, Ministry of Skill Development & Entrepreneurship, Government of India
	<b>Tmt P Ramana Saraswathi, IAS</b> Joint Director of e-Governance and Joint CEO, TNEGA, Government of Tamil Nadu
	<b>Dr Christian Hirst</b> Head - Political and Economic Sections, Australian High Commission, New Delhi
	<b>H E Mohamed Maliki</b> Ambassador of His Majesty the King of Morocco to the Republic of India



## GTF 2020 - Closing Ceremony

Day 5 : 18 October 2020 (Sunday)

### TIME (in IST)

### AGENDA

#### *POWER PANEL DISCUSSION - THE ROLE OF ACADEMIA IN FUTURE OF RESEARCH*

This exclusive power panel will drive discussions and deliberations on the title "**The Role of Academia in Future of Research**" and which shall bring in the perspectives in the following areas:

- Changing Role of Academia in Research
- The Future of Research
- Academia Collaboration in Industrial Research

10:00 am – 11:30 am

**Prof M K Surappa**

Vice Chancellor, Anna university, India

**Dr Karisiddappa**

Vice Chancellor, Visvesvaraya Technological University, India

**Haridas Menon U**

Head - HR, TCS Research & Org. Infra.

**Dr Anbu Rathinavel**

Chief Design Officer, Intellect Design Arena Ltd

**Dr G Sainarayanan**

General Manager, HCL Technologies Ltd

11:30 am - 11:45 am

**Best Paper Recognition Ceremony**

11:45 am - 12:10 pm

*Vote of Thanks*

**Dr B Anbuthambi**

President, ICT Academy

## PATRONS



**Prof Ashutosh Sharma**  
Secretary - Department of Science and Technology  
Government of India



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Chairman  
National Board of Accreditation



**Dr Virander Singh Chauhan**  
Chairman  
National Assessment and Accreditation Council



**Prof Anil D Sahasrabudhe**  
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AICTE



**Lakshmi Narayanan**  
Emeritus Vice Chairman, Cognizant  
Chairman, ICT Academy



**Hans Raj Verma IAS**  
Additional Chief Secretary (FAC) - IT Department  
Government of Tamil Nadu



**Sunita Sanghi IES**  
Senior Advisor - Ministry of  
Skill Development  
& Entrepreneurship, Government of India



**M Vijayakumar IAS**  
Managing Director  
Electronics Corporation of Tamil Nadu



**Santosh K. Misra IAS**  
Commissioner - e-Governance  
MD - Tamil Nadu e-Governance Agency



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**Dr Viju Ravichandran**  
Head Education Technical Evangelist  
MathWorks India





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SVP, Global Revenue Assurance &  
Chief Learning Officer, Hexaware Technologies



**Dr Anbu Rathinavel**  
Chief Design Officer  
Intellect Design Arena Ltd



**M P Vijay Kumar**  
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**M Sivakumar**  
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**Viswanathan Venkat**  
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**Dr G Sainarayanan**  
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Services, HCL Technologies Ltd



**J Kesavardhanan**  
Founder and CTO  
K7 Computing



**Koodli Subramanya**  
Director - Industry Business Consultant  
Dassault Systemes



**Akhila Rajeshwar**  
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**Chandrashekar C**  
Senior Director - HR,  
Virtusa



**Dr B Anbutambhi**  
President  
ICT Academy

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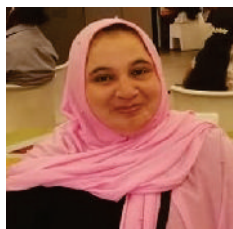
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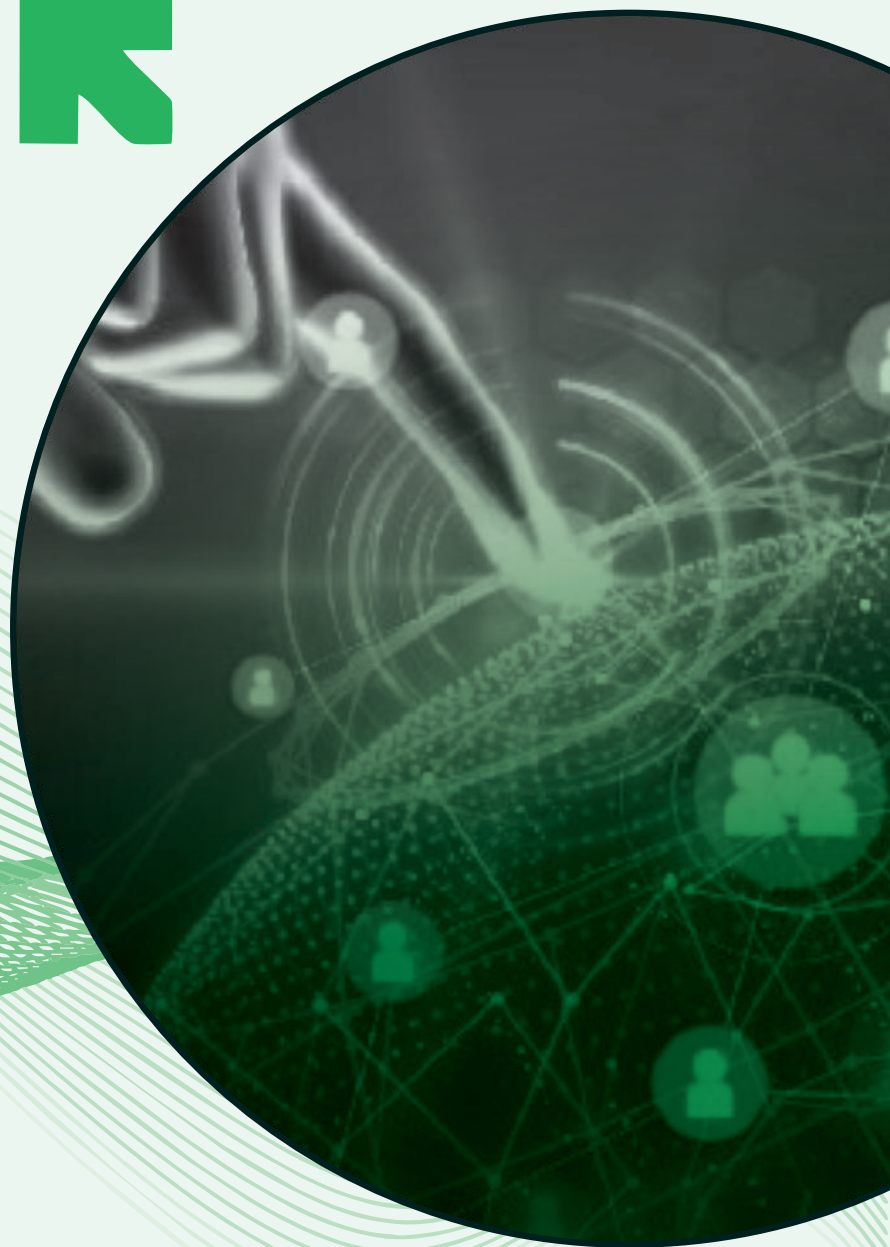
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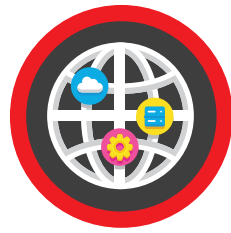
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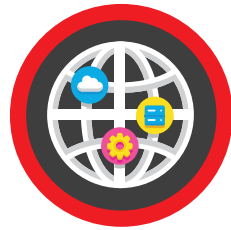
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ICIHPE 2020 brings together the scientists, practitioners, researchers and scholars to submit their research papers on all aspects of IoT, High Performance and Edge Computing. Authors are invited to submit original and unpublished research work; papers of successful technology transfer to new problem domains in the specified conference scopes.

## SCOPE

- ⊙ Algorithmic techniques for resource allocation and optimization
- ⊙ Applications and Case Studies of IoT and Cyber-Physical Systems
- ⊙ Computing Platforms for IoT
- ⊙ Data Acquisition, Storage & Management for IoT
- ⊙ Industry IoT
- ⊙ IoT Applications and Services
- ⊙ IoT Data Analytics
- ⊙ Machine Learning for IoT
- ⊙ Security and Privacy for IoT
- ⊙ Applications of Edge Computing
- ⊙ Architecture of Edge Computing systems
- ⊙ Edge AI
- ⊙ Emerging Computational architectures
- ⊙ GPUs
- ⊙ Green Edge Computing
- ⊙ High performance processing architectures
- ⊙ Hybrid Clouds in Edge Computing
- ⊙ Industry-Specific Edges
- ⊙ Networks for High Performance Computing Platforms
- ⊙ Neuromorphic Architectures
- ⊙ Programming the Edge Computing
- ⊙ Quality of Service in Edge Computing
- ⊙ Reliability in Edge Computing Systems
- ⊙ Scalable systems and software architectures for high-performance computing
- ⊙ Security and Privacy in Edge Computing Systems
- ⊙ Software of Edge Computing
- ⊙ Systems software for distributed data frameworks
- ⊙ Techniques to enhance parallel performance
- ⊙ Vector Processors
- ⊙ Workflows in Edge Computing





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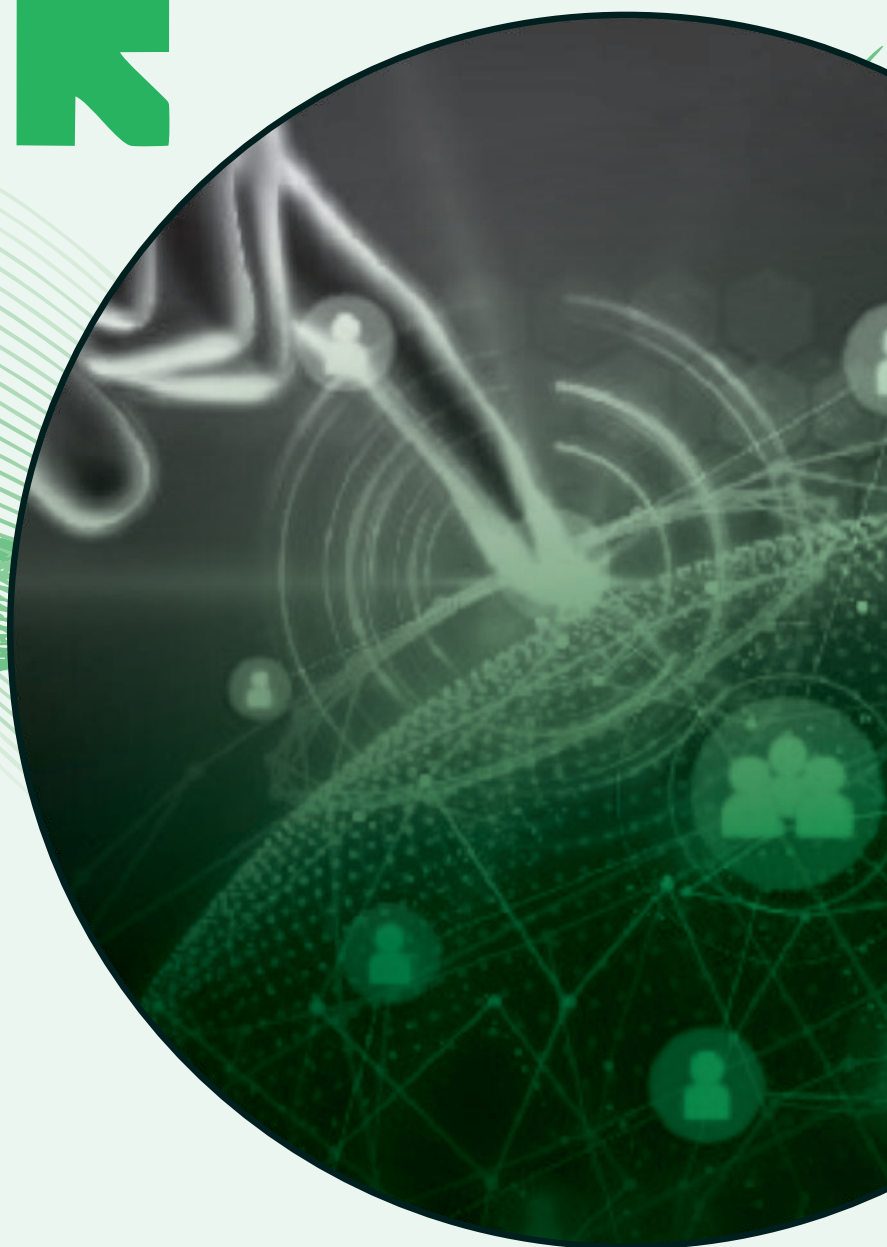
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# Proceedings of International Conference on Advances in IoT, High Performance and Edge Computing 2020

▶ Application of Data Mining Techniques for Stock Market Prediction Using Historical Stock Prices K. Anusha and A. Murugan	1
▶ An Optimized Blowfish Algorithm for Data Security in Constrained World of IoT Devices T Premalatha	5
▶ IoT Implementation for Retail Business S. Vigneshwaran, A.R. Alaganand, R.M. Jeevanth Pandian, B. Amarnath, S. Koushikshiva and K. Poomani	11
▶ Pico-Hydro Electric generation in Underground Water Distribution Pipeline K. Adhithyaa, B. Vетtri, J. Hari Prakash, J. Bharanidharan and T.J. Deepika	15
▶ A Novel AI based Recommendation Systems for Identification of Spammers using Sentimental Analysis of COVID-19 Tweets R. Hemalatha and Jasmine Thomas	19
▶ An Explicit Inspection on Bio Inspired Optimization Algorithm M. Kayalvizhi and S. Geetha	24
▶ New Education Policy 2020 and ICT as a Tool of Knowledge Transformation in Indian Education System Pradip Mochahary and Nabanita Sarmah	28
▶ Theoretical Validation of the Cognitive Complexity Metrics CWICC and ICWCC K. Maheswaran	34
▶ Workplace Social Support of Indian Expats in Muscat A. Anbazhagan, R. Sivakumar and NSN Cailassame	37
▶ Age and Gender Detection with Neural Compute Stick for Visually Impaired People Aditi H. Khandewale, Vinaya Gohokar and Pooja Nawandar	43
▶ The Inevitable Role of IoT in Business Transactions during Pandemic D. Ganesan and G. Vidhya	46
▶ Automatic Intravenous Fluid Control and Emergency Monitoring System using IoT J. Jayanthi, R. Padmashani, S. Preethi and B. Ranjitha	48
▶ Internet of Things Innovation for Customer's Shopping Assistance Through Smart Grocery System K. Thangaraj, S. Vasanthi, J.L. Aldo Stalin and P. Ilanchezhian	52
▶ An Implementation of LCL T-Resonant DC-DC Converter for Portable Applications M. Murali and R. Arumozhiyal	56
▶ Application of Sensors in Civil Engineering for Structural Health Monitoring Ashokkumar Palanisamy and Jegadeeswaran Dhanapal	59
▶ Challenges and Issues on Placement of Virtual Machines in a Cloud Data Centre: A Survey M.R. Sundarakumar	61
▶ Impact of Cyber Physical Systems and Internet of Things in Smart Buildings - An Exploratory View Rajeshwari K C and Nandini V	67

▶	Integration and Dissemination of Data across IoT and Cloud Structured IAASFramework A. Vanitha, S. Aruna and N. Balakrishnan	71
▶	Stock Updation in Ware Houses Using Cloud Computing and Message Queuing Telemetry Transport K.R. Kavitha, S. Vijayalakshmi, M. Amutha, A. Ayubkhan and S. Sreesouthry	76
▶	Cloud Based Big Data Computing A. Suhana Nafais and T. Padma	80
▶	Providing High Security for Encrypted Data in Cloud A. Prithviraj, M. Anitha, S. Sakthivel and G. Vidhya	85
▶	Secure Data Storage with Dynamic Auditing Services in the Cloud G. Vidhya, D. Vidhyabharathi, S. Theetchenya and M. Marimuthu	88
▶	Internet of Things (IoT) in Smart Cities Sharad Jain, N. Krishna Khanth and Mukta Sharma	93
▶	AI at the Edge Emerging Opportunity and Challenges V. Sowmeya and R. Jayakarthish	99
▶	Novel Multi-Level Aspect Based Sentiment Analysis for Improved Root-Cause Analysis Naveenkumar Seerangan and Vijayaragavan Shanmugam	102
▶	Survey on Natural Vegetation using Data Mining Algorithms and IoT Techniques R. Vidhu and S. Niraimathi	108
▶	Impact of IoT in the Sensors Involved in Smart Applications B. Azhagusundari and R. Latha	113
▶	Enhancement of Handshake Protocol using Stacking Method in Virtual Switching Structure S. Hemkiran and R. Prathusha	118
▶	A Review on Role of Internet of Medical Things (IoMT) in Testing, Tracking and Treating (3T's) of Novel Coronavirus S. Mythili, S. Gomathi Shruthy, G. Manikandan and B. Rajeeva	122
▶	Aspects and Benefits of Bio Instrumentation in the Path of Internet of Things S. Mohan Ram, R. Gnalini and P. Sathish	127
▶	Automated Crop Management System using K Means Clustering and IoT R. Sangeethapriya, D. Komalavalli, D. Poornashree, K.R. Sachin Ravi and G. Srimathi	131
▶	Dynamic Block Level Data Encryption Scheme for Efficient Data Security in Big Data Cloud Environment Using User Profile Kumaresan S and Vijayaragavan S	136
▶	Security Issues in Internet of Things: A Survey C. Kumuthini, K. Gomathy and A. Nirmala	141
▶	Implementation of Smart IoT System based Bidirectional Converter K. Krishnamoorthy and S. Sasikumar	143

▶	Novel Trust Based Ranking for Intrusion Detection and Security using Deep Learning Josemila Baby and J.R. Jeba	150
▶	Optimization of Nutrient Supply in Smart Terrace Gardening Using IoT D. Lousia Mary and M. Ramakrishnan	156
▶	Internet of Things Based Smart and Intelligent Transportation System for Accident Prevention K. Radhika and N. Suthanthira Vanitha	160
▶	Smart Health Humanoid against Spread of Covid-19 Pandemic S. Periyamayagi, A. Manikandan, M. Muthu Krishnan and P. Gowtham	163
▶	Threat Modelling for IoT based Water Irrigation Monitoring System for Agriculture R. Manimegalai and C.K. Uday Karthick	167
▶	Applying Format Preserving Encryption for Cloud Security S. Vidhya, P. Krishnapriya and P. Ajitha	172
▶	An IoT-based Anti-Theft Tracking System for Two Wheelers R. Pradeepkumar, K. Ramprakash, G. Gopalakrishnan, E. Rahul, S. Sherin, K.S. Shivani and J. Saranya	176
▶	Design and Implementation of IoT Based Underwater Wireless Communication System P.L. Madhuri and J. Ann Rossela	180
▶	IoT: A New Tool for Productivity Improvement N. Venkatesh, M. Kavya Kamath and Abhinav Vimukthi	184
▶	Replication and Migration Cost Minimization of Cloud Data Center Arunambika T and Senthil Vadivu P	191
▶	MOO-Monitor, Smart Cattle Monitoring Vernika Sapra and Urvashi Sapra	200
▶	Smart Blood Bank System K. Saranya, S. Vijayasharathi and T. Premkumari	205
▶	A Framework for Analysing Unstructured Data in Computing Devices J. Dhayanithi, M. Marimuthu, G. Mohanraj and P. Neelashkumar	207
▶	A Comparative Study on Auto Evaluation of Programming Courses J. Dhayanithi, D. Balamurugan, M. Marimuthu and G. Mohanraj	210
▶	Supply Chain Management an Innovative Application of Edge Computing J. Manoranjini and Krishna Mouli	214
▶	IoT: A New Tool for Productivity Improvement N. Venkatesh, M. Kavya Kamath and Abhinav Vimukthi	218
▶	IoT Based Patient Monitoring System J. Josifha Ashmi and S. Gavaskar	225
▶	Design of Smart Safety and Health Reporting Device for Women using IoT Technology and Mobile Mesh Networking A. Kodieswari, S. Bhasith, A. Devaki, S. Ananthalakshmi and J. Rakshith	228