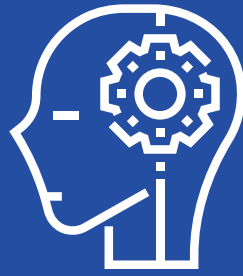




ICT ACADEMY  
**GLOBALTECHNOLOGY**  
FORUM 2020

14-18 October 2020

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**ICARA 2020**  
INTERNATIONAL CONFERENCE ON  
**AI, ROBOTICS AND  
AUTOMATION**

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



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## 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.



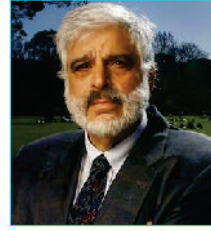
## KEYNOTE AND TUTORIAL SPEAKERS



**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



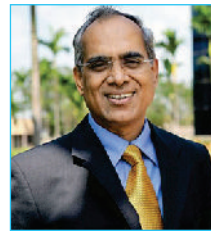
**Dr Rajendrakumar IAS**  
Additional Secretary Ministry  
of Electronics & Information  
Technology, Govt. of India



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



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



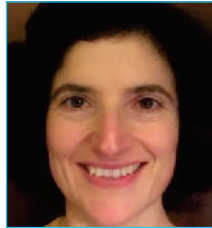
**Lakshmi Narayanan**  
Emeritus Vice Chairman, Cognizant  
Chairman, ICT Academy, India



**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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**Prof M K Surappa**  
Vice Chancellor  
Anna university, India



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



**Dr Karisiddappa**  
Vice Chancellor  
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University, India



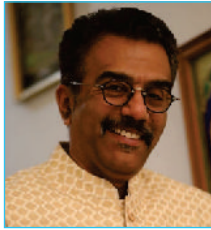
**Pete Winn**  
Senior Research Advocate  
Oracle



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



**H E Mohamed Maliki**  
Ambassador of His Majesty  
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Sona Group of Institutions  
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Chief Executive Officer  
ICT Academy, India



**Nikhil Bagalkotkar**  
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Joint Director of e-Governance  
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University of Melbourne  
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**Dr Anbu Rathinavel**  
Chief Design officer  
Intellect Design Arena Ltd



**Prof Salil Kanhere**  
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**Dr Ramesh Pudale**  
Autodesk



**Dr G Sainarayanan**  
General Manager  
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HCL Technologies Ltd



**Dr Debanand Singdeo**  
MathWorks



**Ramana Anchuri**  
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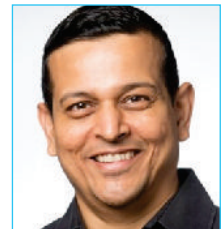
**Haridas Menon U**  
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TCS Research & Org. Infra.



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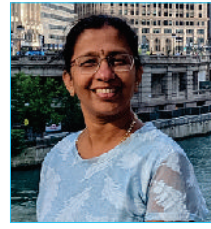




Anand Pujari  
Autodesk



Dr B Anbuthambi  
President  
ICT Academy



Bindu Nanjundaswamy  
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Dhiren Dutta  
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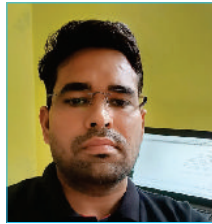
Shivaprasad A V  
Vmware



Ramya Victor  
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Chandana Radhakrishna  
Oracle



Rajendra Raghuvanshi  
Oracle



Badari Hiriyur  
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Ranjani Swaminathan  
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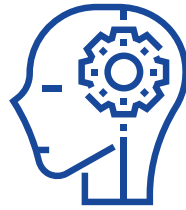
ICT ACADEMY  
**GLOBAL TECHNOLOGY**  
FORUM 2020

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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  
Security & Automation**  
(Audi 3)

#### 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



↓  
**ICSCES 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

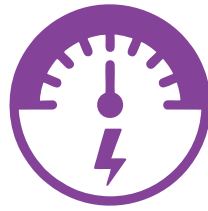
*Tutorial Session II (Audi 2)*

**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

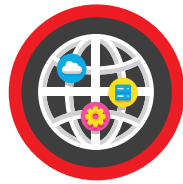
	<i>Opening Keynote Session</i>	
09:30 am – 10:10 am	<b>Dr Rajendra Kumar IAS</b> Additional Secretary, Ministry of Electronics and IT (MeitY), Government of India	
10:10 am – 10:40 am	<b>Kiran Jacob</b> Industry Process Consultant - Dassault Systemes India Pvt Ltd	
10:40 am – 11:10 am	<b>Thiru M Vijayakumar IAS</b> Managing Director, Electronics Corporation of Tamil Nadu Limited, Government of Tamil Nadu, India	

	<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	
11:20 am – 01:45 pm	<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	

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

	<i>Evening Keynote Session</i>	
05:30 pm – 06:15 pm	<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		
<i>Technical Paper Presentation</i>			
01:45 pm – 03:45 pm	Track 1a: <b>IoT Techniques and Applications</b> <i>(Audi 1)</i>	Track 2a: <b>IoT Techniques and Applications</b> <i>(Audi 2)</i>	Track 3a: <b>Edge and Cloud Computing</b> <i>(Audi 3)</i>
03:45 pm – 05:20 pm	Track 1b: <b>IoT Techniques and Applications</b> <i>(Audi 1)</i>	Track 2b: <b>IoT Techniques and Applications</b> <i>(Audi 2)</i>	Track 3b: <b>Cloud Computing Security</b> <i>(Audi 3)</i>
<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



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



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National Assessment and Accreditation Council



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Emeritus Vice Chairman, Cognizant  
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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



**Krish Ganesan**  
Vice President - HR and Global Head Recruitment  
Tata Consultancy Services



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Microgram



**M Sivakumar**  
Chief Executive Officer  
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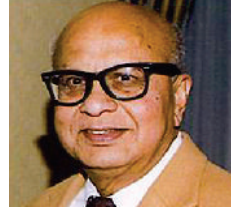
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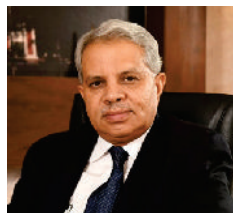
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SVP, Global Revenue Assurance &  
Chief Learning Officer, Hexaware Technologies



**Dr Anbu Rathinavel**  
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**M P Vijay Kumar**  
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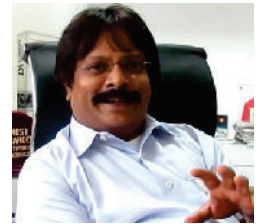
**Vasudevan Rajagopalan**  
Head - Talent Acquisition (India)  
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**Viswanathan Venkat**  
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**Dr G Sainarayanan**  
General Manager, Engineering and R&D  
Services, HCL Technologies Ltd



**J Kesavardhanan**  
Founder and CTO  
K7 Computing



**Koodli Subramanya**  
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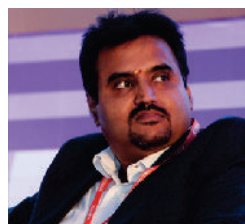
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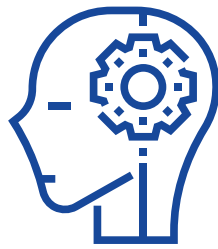
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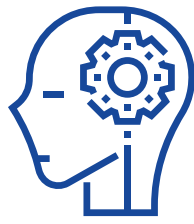
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ICARA 2020 brought together the scientists, practitioners, researchers, academicians and research scholars who submitted their research papers on aspects of AI, Robotics and Automation. Authors were invited to submit original and unpublished research work; papers of successful technology transfer to new problem domains in the specified conference scopes.

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- AI based Advanced Healthcare Systems
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- Distributed Intelligence
- Ethical AI
- Fuzzy Expert Systems
- Fuzzy Logic Techniques and Applications
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- Natural Language Processing
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