

# AIES 2021

*The International  
Conference on  
Artificial Intelligence  
& Energy Systems*

December 08 & 09, 2021 • Virtual Mode

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PROCEEDINGS

**ST. JOSEPH'S**  
COLLEGE OF ENGINEERING  
AND TECHNOLOGY,  
- PALAI -

CHOONDACHERRY P.O., KERALA, INDIA 686579







# The International Conference on Artificial Intelligence & Energy Systems - 2021

**Main Theme:** *Energy Efficient Systems for Human Empowerment*

## THE CONFERENCE



St. Joseph's College of Engineering and Technology, Palai, Kerala was established in 2002 by the Diocese of Palai. Discipline, Hard Work, Positive Thinking, Commitment to excellence and abiding Faith in the Almighty are the guiding principles that propel the college to its vision of emerging as a Centre of Excellence in technical education in the country.

Value systems such as eco-friendliness, quality consciousness and work ethics are also being instilled through the special work culture and campus life existing in the college which helps the student community of this college to serve the society in a more organized and effective manner.

The conference name is "The International Conference on Artificial Intelligence and Energy Systems (AIES 2021)". Energy Efficient Systems for Human Empowerment is the main theme of this conference. It will be value addition to the faculty members and students attending the conference.



# AIES 2021

## CONFERENCE DETAILS

*Title:*  
**International Conference on  
Artificial Intelligence & Energy Systems**

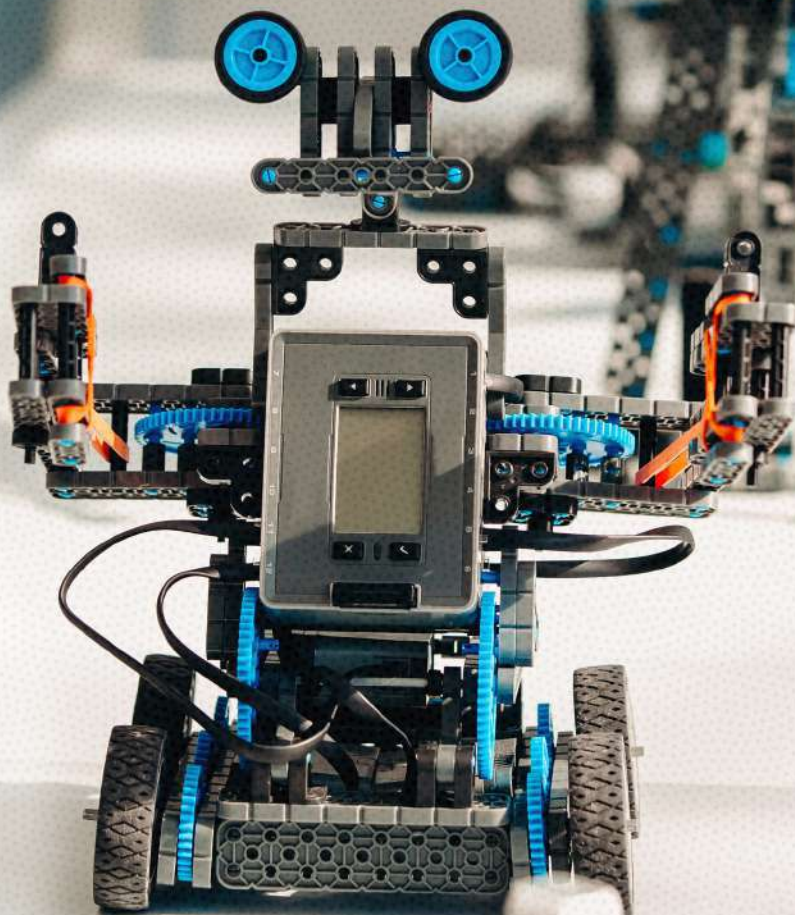
*Abbreviated title:*  
**AIES 2021**

*Date:*  
**8 - 9 December 2021**

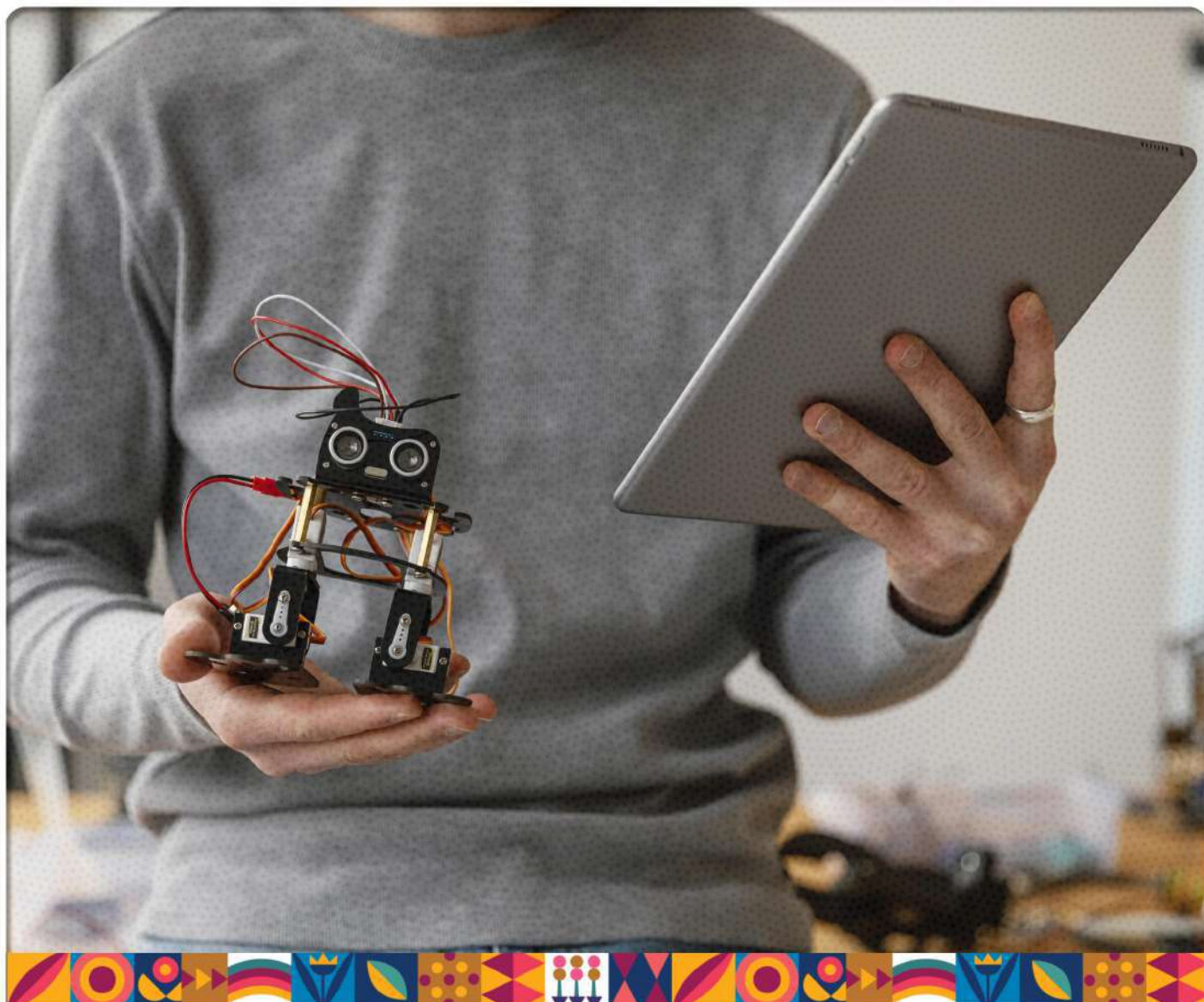
*Venue:*  
**St. Joseph's College of Engineering  
& Technology Palai, Kerala, India (Online)**

*Conference Website (URL):*  
**<https://aies.sjcetpalai.ac.in/>**

*Contact email:*  
**[aies2021@sjcetpalai.ac.in](mailto:aies2021@sjcetpalai.ac.in)**







## ABOUT THE CONFERENCE

AIES 2021 is one of the premier virtual events in its kind worldwide organised by St. Joseph's College of Engineering and Technology (SJCET), Palai, sponsored by AICTE. Previous series of International conferences has received excellent response from the scientific, research and academic communities from different parts of the world. The 2021 International Conference on Artificial Intelligence and Energy Systems (AIES 2021) aims for a great gathering of both industrial and academic professionals across the world in the fields of artificial intelligence, energy systems, materials science and manufacturing technology. It provides a major forum for the exchange of information among practicing professionals in latest technologies.

AIES 2021 is dedicated to bringing up substantial discussions on major sectors of advanced materials processing, Artificial

Intelligence, Energy Systems, characterization techniques, modeling & simulation, material properties, performance and device fabrication. AIES 2021 provides a platform to the research scholars, faculty, scientists and industry professionals to share their research findings, solutions to the domain problems and their valuable experience. The conference will feature keynote and plenary lectures from eminent personalities of RMIT, Australia, R&D organizations and other reputed institutes in Australia and Europe.

Main objective of the conference will be exposure of Graduate, Post graduate as well as Research scholars to international speakers in emerging areas and knowledge up gradation. The impact of the conference will be reflected through the publication in various reputed journals published by Elsevier. Faculties will be able to publish their works in reputed journals indexed by Scopus in various interdisciplinary engineering fields. The conference will make a platform for publishing the recent works of academic community in reputed journals and thereby provide interaction of students with reputed academicians globally. Presentation will be conducted virtually in online platforms.



# STEERING COMMITTEE



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(Chairman, SJCT)

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- **Dr. Madhukumar S.,** Vice Principal, SJCT

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- **Dr. V. P. Devassia,** HoD, ECE, SJCT
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34. **Mr. P. S. Suresh,** General Manager, HMT Ltd., Kalamassery, Cochin
35. **Mr. Unnikrishnan Nair A. M.,** CTO, Cords Innovations Pvt Ltd,  
Kothanallor & Ernakulam



# CALL FOR PAPERS



AIES 2021 invites full length original research articles from research scholars, faculty, scientists and industry professionals from India and across the world. Research articles and review papers not exceeding eight pages in single column format shall be submitted.

The manuscripts should not have been published or under review in any of the journals or conference proceedings. Further, manuscript should contain the name, e-mail id of the corresponding author and affiliation of co-authors.

Publication of the conference - AIES 2021 will be in Elsevier's Materials Today: Proceedings.

# IMPORTANT DATES



The important dates for the conference are as follows:

Call for papers:  
**August 26, 2021**

Submission of full paper:  
**September 30, 2021**

Last date to submit camera ready paper:  
**November 10, 2021**

Last date for registration:  
**November 20, 2021**

Conference Dates:  
**December 8-9, 2021**

# PAPER SUBMISSION



Soft copy of the full length manuscripts (in .pdf) in Elsevier's Materials Today: Proceedings template shall be submitted to EasyChair through <https://easychair.org/conferences/?conf=aies20211>.



Please visit <https://aies.sjcetpalai.ac.in/> for author guidelines to prepare and submit your manuscript to Materials Today: Proceedings.

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# PUBLICATIONS



All submitted papers will be peer-reviewed. Only accepted and presented papers in AIES 2021 will be proceeded for publication in **Materials Today: Proceedings** – a new journal specializing in the publication of conference proceedings.

Materials Today: Proceedings provides the engineering community with a fast and flexible route to publication of research works presented at scientific conferences. All papers must be original, and within the scope of the conference and peer-review is mandatory.

Materials Today Proceedings is indexed in **Scopus, Conference Proceedings Citation Index** (Thomas Reuters, Web of Science).

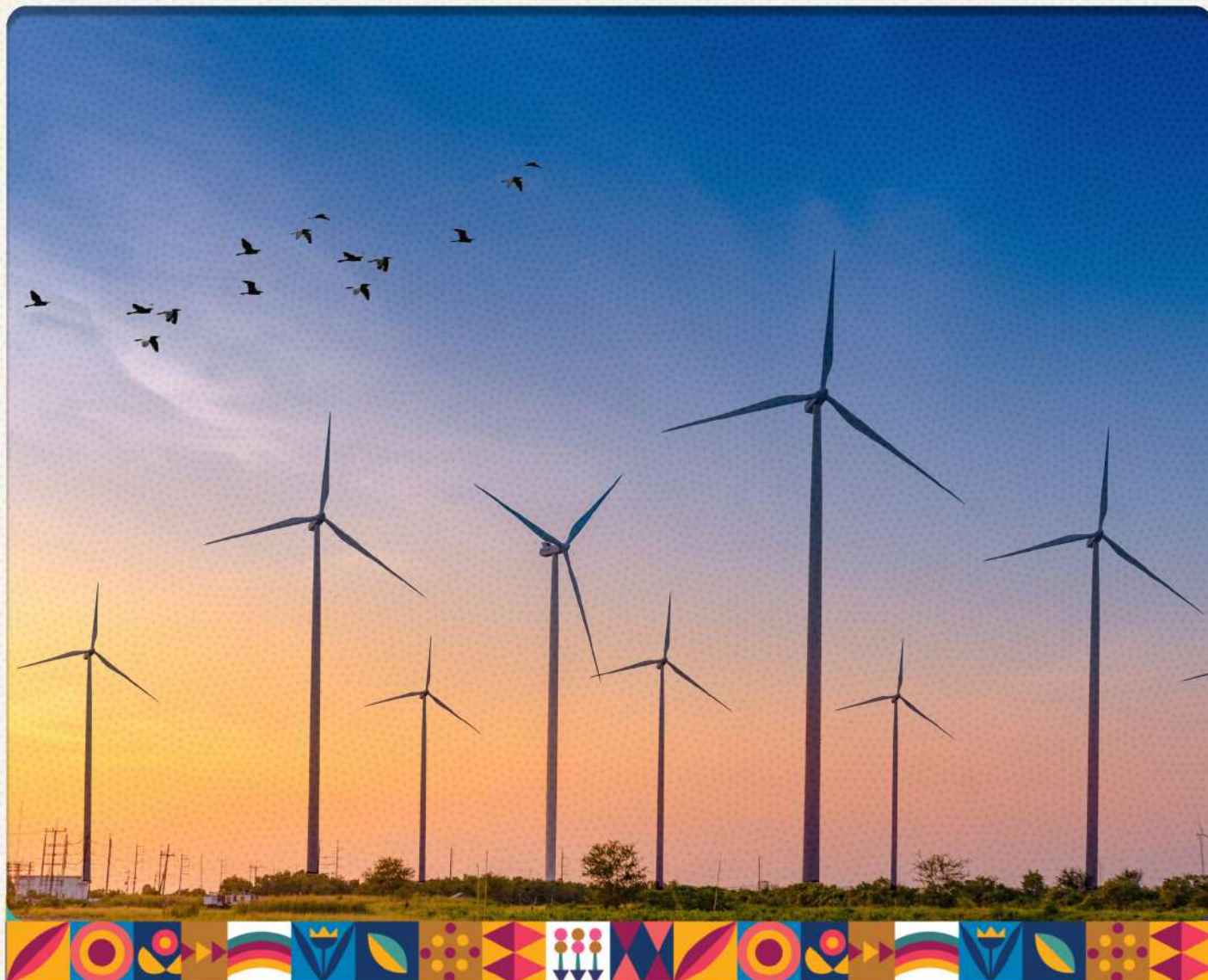


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## QUERIES



For queries related to submission and publications, please reach us at:

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Publication Coordinator  
(+91) 9447568494  
(Call / WhatsApp)

## CONFERENCE DETAILS



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Website: [www.aies.sjcetpalai.ac.in](http://www.aies.sjcetpalai.ac.in)





## CHIEF GUEST



### Prof. Songlin Ding

Professor, STEM College,  
Bundoora East Campus,  
Australia

Professor Songlin Ding is the Program Director for Master of Engineering (Manufacturing) program at the School of Engineering, RMIT University, Australia. He received his PhD degree in Mechanical Engineering from the National University of Singapore in 2004.

Before joining RMIT in 2005, Prof Ding had worked as a Research Assistant at the Department of Mechanical and Aerospace Engineering, University of California Los Angeles, United States; Senior Engineer at the Global Research Centre of General Electric (GE) in Shanghai, China; and Research Fellow at the Institute of High Performance Computing of A\*Star in Singapore. Prof Ding's research area includes geometry modelling,

Computer Aided Design and Manufacturing (CAD/CAM), manufacturing systems, high speed CNC and nonconventional machining of advanced materials such as synthetic diamond and titanium alloys. He has been awarded twelve large research grants including those from the Australian Research Council (ARC), Advanced Manufacturing Collaboration Research Centre (CRC), Federal and Victoria state government agencies.

Prof Ding has developed wide collaborations with researchers in the USA, UK, Malaysia, China and Singapore and has published over 130 research papers in the related areas.

## KEYNOTE SPEAKERS



### 1 Prof. Enrico Staderini,

Director, Healthy World Association - Switzerland  
Rue Henry Correvon, 15  
1400 Yverdon-les-Bains (VD)  
Switzerland

Enrico Staderini is a professor at the Haute École d'Ingénierie et de Gestion de l'État de Vaud HEIG-VD Western Switzerland University of Applied Sciences HES-SO (Industrial Automation Institute) in Yverdon-les-Bains, Switzerland. His main research interests focus on neurophysiology instrumentation, sport technologies, cognitive science, UWB medical radars, rehabilitation engineering, biomedical electronics and assistive devices for the elderly and the handicapped people. He published more than fifty peer-reviewed scientific papers and directed important research projects.

Enrico holds a MD degree from the University of Rome "La Sapienza" (1981) in Italy from which he also got a specialization degree (postgrad) in biomedical engineering (1982) and a PhD in cardiovascular physiopathology (1988). Then he specialized (postgrad) in assistive devices engineering for the elderly and disabled people (2003) from the University of Trieste (Italy). He also qualified as EUCIP – European Certification for Informatics Professionals (a European qualification from the CEPIS Council of European Professional Informatics Societies).

A registered physician in Italy (1982-), Norway (2006-) and Switzerland (2011-), after a combined career in the medical practice, the informatics and the biomedical devices industry, Enrico served as invited professor in India, USA, Brazil, Norway, IAEA-UNESCO ICTP and as researcher in Italy teaching medical physics and biomedical engineering. He is still active at international level with very important and tight relations with Indian companies and universities, besides others.

Enrico Staderini is the President of the Swiss based Healthy World Association HWA and member of the International Electrotechnical Commission (IEC), the IEEE, the Swiss Society for Biomedical Engineering (SGBT), the Bern based BioMedical Engineering Club (BMEClub) and he was member of the once Swiss Electromagnetics Research & Engineering Center (SEREC). A member of the Rotary District 2080 Club "Leonardo da Vinci" in Rome, Italy, he also sits in various International and National Experts Panels and Doctorate boards.





## 2 Prof. Valentina Emilia Balas,

Aurel Vlaicu University of Arad,  
Romania

Valentina E. Balas is currently Full Professor in the Department of Automatics and Applied Software at the Faculty of Engineering, "Aurel Vlaicu" University of Arad, Romania. She holds a Ph.D. in Applied Electronics and Telecommunications from Polytechnic University of Timisoara. Dr. Balas is author of more than 270 research papers in refereed journals and International Conferences. Her research interests are in Intelligent Systems, Fuzzy Control, Soft Computing, Smart Sensors, Information Fusion, Modeling and Simulation.

She is the Editor-in Chief to International Journal of Advanced Intelligence Paradigms (IJAIP) and to International Journal of Computational Systems Engineering (IJCSysE), member in Editorial Board member of several national and international journals and is evaluator expert for national, international projects and PhD Thesis. Dr. Balas is the director of Intelligent Systems Research Centre in Aurel Vlaicu University of Arad and Director of the Department of International Relations, Programs and Projects in the same university. She served as General Chair of the International Workshop Soft Computing and Applications (SOFA) in eight editions 2005-2018 held in Romania and Hungary. Dr. Balas participated in many international conferences as Organizer, Honorary Chair, Session Chair and member in Steering, Advisory or International Program Committees.

She is a member of EUSFLAT, SIAM and a Senior Member IEEE, member in TC – Fuzzy Systems (IEEE CIS), member in TC – Emergent Technologies (IEEE CIS), member in TC – Soft Computing (IEEE SMCS). Dr. Balas was past Vice-president (Awards) of IFSA International Fuzzy Systems Association Council (2013-2015) and is a Joint Secretary of the Governing Council of Forum for Interdisciplinary Mathematics (FIM), - A Multidisciplinary Academic Body, India.

### Prof. Valentina Emilia Balas, Ph.D.

"Aurel Vlaicu" University of Arad  
Faculty of Engineering  
Department of Automation and Applied Informatics  
Director of the Department of International Relations,  
Programs and Projects  
Head of the Intelligent Systems Research Centre  
IEEE Senior Member  
77 B-dul Revolutiei  
310130 Arad  
Romania



## 3 Dr. Stefan Maas,

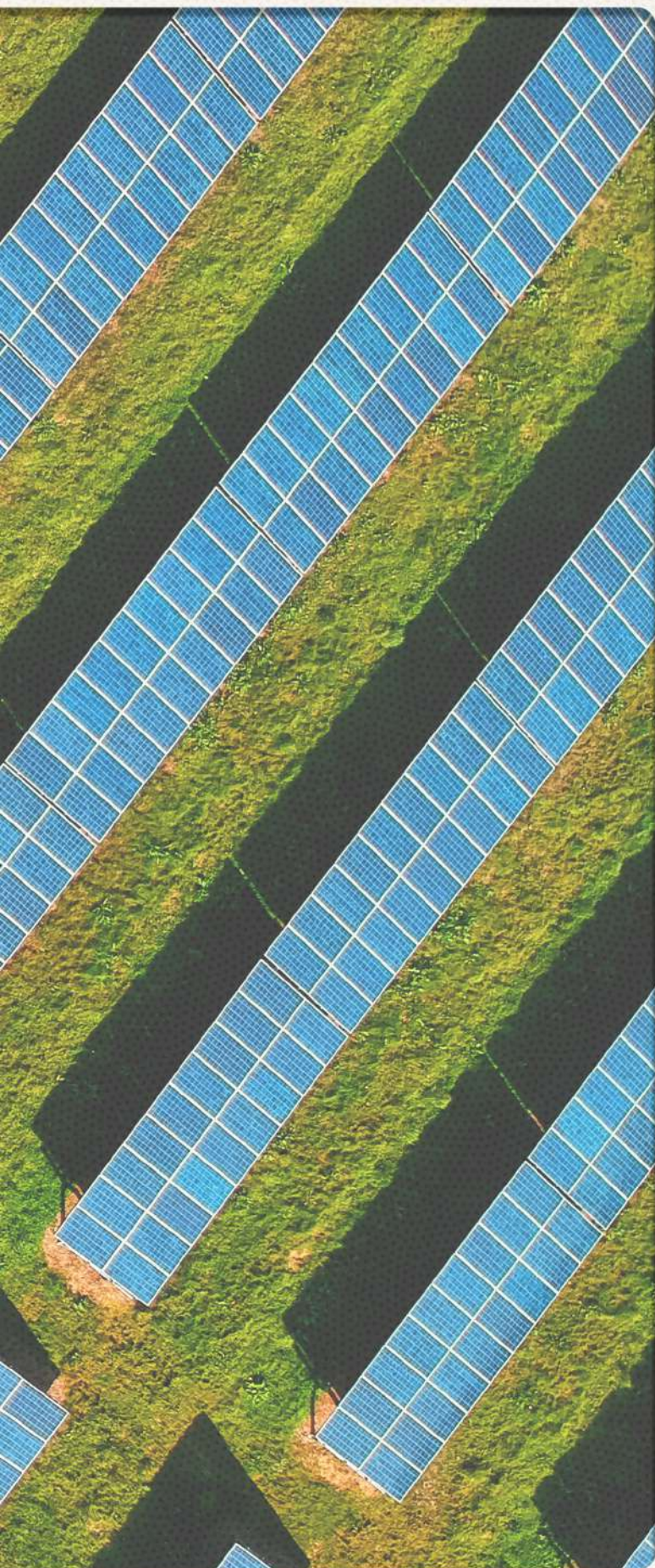
Professor,  
University of Luxembourg,  
Faculty of Science, Technology and Medicine  
Full professor in the Department of Engineering (DoE)

- Born 1962 in the region of Trier
- Classical school education with A-levels in 1982
- Studies in mechanical engineering with specialization in 'Theoretical Engineering' at University of Kaiserslautern; diploma in 1988
- PhD in 1991 in dynamics and controls at the University of Kaiserslautern
- Professional experience from 1992-1993 as development engineer for industrial sewing machines in a company with 6000 employees
- Project-engineer and later engineering manager for pressure vessel design in a family owned company with 800 employees
- Since 1999 professor at 'Institut Supérieur de Technologie', one of the predecessors and founding institutions of the University of Luxembourg

### Teaching and Research in:

- applied mechanics: statics, dynamics, strength of materials, finite elements and biomechanics
- energy efficiency in buildings and industrial processes
- Study director for two master curricula in engineering sciences
- 1) *Master en Développement Durable (uni.lu)*
- 2) *Master en Sciences de l'Ingénieur - Efficacité Énergétique et Économique (uni.lu)*
- More than 100 Publications since 2006 see <http://orbilu.uni.lu/>
- More than 20 completed PhD-theses as principal supervisor
- Many external funded projects by industry or national or European institutions





## 4 **Dr. Darren Fraser,** Senior Experimental Scientist, Australia

Darren Fraser is a materials engineer, doing research in CSIRO Lab 22 on the Arcam electron beam melting 3D printing process. He did his PhD in 2001 in die cast tooling through the CAST cooperative research Centre. He has been involved in powder processing and Cold Spray during its early stages at CSIRO. His work on the Arcam has included various biomedical implants for local companies, corrosion and CT scanning of 3D printed materials, and blended Titanium powders for biomedical applications.



## 5 **Dr. Geoff Webb,** Research Director, Monash University Data Futures Institute

Geoff Webb is a leading data scientist. He is Research Director of the Monash University Data Futures Institute and a Technical Advisor to data science startups FROOMLE and BigML Inc. The latter have incorporated his best of class association discovery software, Magnum Opus, as a core component of their advanced Machine Learning service. He has pioneered multiple research areas as diverse as black-box user modelling, interactive data analytics and statistically-sound pattern discovery. He has developed many useful machine learning algorithms that are widely deployed. He has applied machine learning in a broad range of applications including manufacturing, finance, medicine, biology and geoscience. He was editor in chief of the premier data mining journal, Data Mining and Knowledge Discovery from 2005 to 2014. He has been Program Committee Chair of the two top data mining conferences, ACM SIGKDD and IEEE ICDM, as well as General Chair of ICDM. He is an IEEE Fellow. His many awards include the prestigious inaugural Australian Museum Eureka Prize for Excellence in Data Science. His 280+ academic papers have received over 15,000 citations with an h-index of 60. Seven of his recent papers have been recognised as Clarivate Web of Science High Cite papers (top 1% of citations for the discipline).



# SCOPE & TOPICS



## Artificial Intelligence Track

### Track 1: Artificial Intelligence Applications

- Artificial Intelligence
- Data Science
- Neural Networks
- Internet of Things
- Machine Learning
- Robotic Systems
- Autonomous Vehicles
- Computer Vision
- Deep Learning
- Convolutional Neural Networks
- Pattern Recognition
- Inference Systems
- Optimization Techniques
- Reinforcement Learning
- Supervised Learning
- Learning Algorithms
- Artificial Neural Systems

### Track 2: Signal and Image Processing

- Signal Processing
- Image Processing
- Video Processing
- Speech Recognition
- Language Processing
- Wearable Devices
- Mobile Assistive Devices
- Healthcare Systems
- ECG, EEG and EMG Systems
- Biomedical Engineering
- Instrumentation Technology
- Biomedical Signal Processing
- Radar Signal Processing
- Remote Sensing
- Environmental Monitoring

### Track 3: Communication Systems

- Wireless Communication
- Mobile Communication
- AdHoc Networks
- Cognitive Radio
- Optical Communication
- Wireless Sensor Networks
- Information Systems
- Microwave Devices
- Sensor Networks
- Embedded Systems
- Energy Harvesting
- Energy Storage Systems
- Electronic Materials
- Optical Materials
- Magnetic Materials
- Biosensor Materials
- Nanoelectronics
- VLSI Technology



## Energy Systems Track

### Track 1: Material Science & Engineering

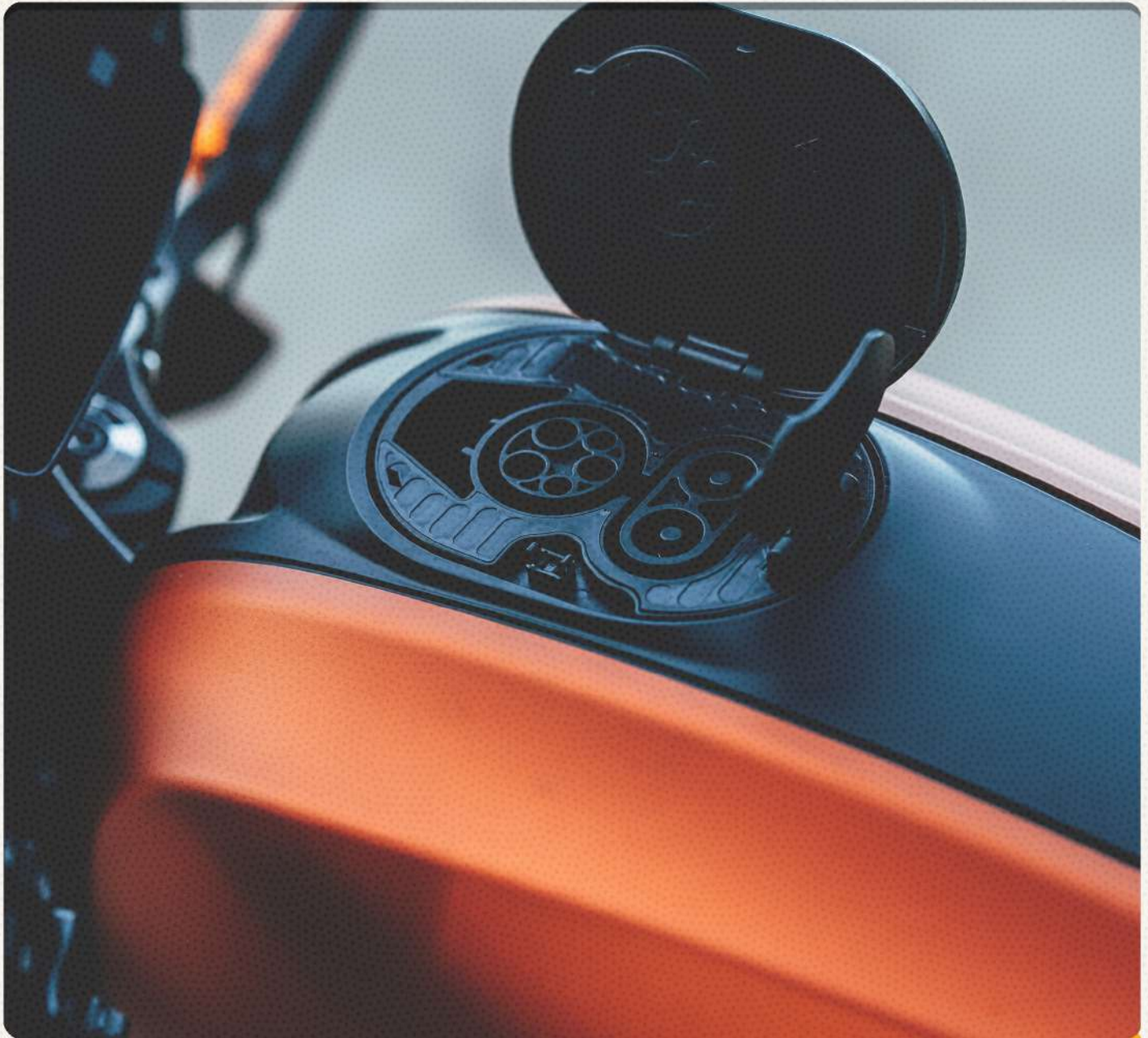
- Engineering materials: Application in Macro/micro/nano processes
- Advanced materials for additive manufacturing
- Smart materials
- Emerging high efficient technologies & Materials
- Renewable Materials
- Sustainable Materials
- Advanced Materials
- Nano materials
- Materials for aerospace applications

- Materials for thermal/Nuclear power plants
- Ultra-fine-grained materials
- Ceramic Materials
- Functional materials
- Composite materials
- Bio materials
- Optical/Electronic/Magnetic materials
- Building Materials
- Materials characterization
- Energy Storage and conversion materials
- Renewable materials
- Synthesis of materials
- High temperature Materials
- Functionally gradient materials

### Track 2: Energy Engineering

- Energy Efficient Materials
- Energy conscious materials for E-mobility
- Waste-to-Energy – Materials & Processes
- Nanomaterials for energy storage & Conversion
- Materials for energy efficient welding
- Renewable Energy
- Sustainable Power
- Solar, Wind and Bioenergy
- Geothermal Energy
- Green nanotechnology
- Nano Environmental Technologies
- Green Energy and Economy
- Bioremediation
- Waste to Energy
- Fuel cells
- Smart Grid
- Sustainable technologies
- Electric vehicles
- Battery energy storage
- Energy Storage and Conservation
- NEXT-GENERATION Technologies in Power sector
- Environmental impact of energy conversion
- Hydrogen energy conversion systems
- Environmental Impact Assessment





### Track 3 – Manufacturing Engineering

- Micro manufacturing
- Precision Technologies
- Additive Manufacturing
- Advanced Machining Processes
- Non-Traditional, Micro and Nano Machining
- Green Manufacturing
- Clean and Sustainable Manufacturing Processes
- Advanced Metal Forming and Bending
- Manufacturing processes, Technology and Automation
- Fabrication of Nano materials and Nano Devices
- Non-Destructive Testing
- Metal joining/Welding and Casting Techniques

- Thermal Protection systems & Coatings
- Surface Engineering
- Surface Design, modification technologies
- Surface process control
- Wear & Tribology
- Computational Methods and Materials
- Manufacturing system and simulation
- FEA Applications
- Process modeling and Simulation
- Numerical Analysis and Optimization Techniques
- Numerical Methods for Scientific Computations
- Optimization Techniques and Methods



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National Institute of Technology, Calicut,  
Kerala, India

**Dr. V. P. Devassia**

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St. Joseph's College of Engineering & Technology Palai,  
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**Dr. Lijo Paul**

Dean, PG Studies,  
St. Joseph's College of Engineering & Technology Palai,  
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**Prof. Tomson Devis**

Department of Electronics & Communication Engineering,  
St. Joseph's College of Engineering & Technology Palai,  
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## CONFERENCE CHAIR



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Principal,  
St. Joseph's College of  
Engineering & Technology, Palai  
Choondacherry P.O., Kerala, India

## ADDRESS FOR CORRESPONDENCE



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Organising Chair, AIES 2021  
Dean, PG Studies,  
St. Joseph's College of Engineering &  
Technology Palai, Kerala, India  
E-mail: aies2021@sjcetpalai.ac.in  
Ph: +91 9846270462



## REGISTRATION FEE



SL.NO.	CATEGORY	PARTICIPANTS from INDIA	FOREIGN PARTICIPANTS
1	Students/ Research Scholar	₹4000 INR	\$100 USD
2	Faculty from Academic Institutions	₹5000 INR	\$150 USD
3	Researchers from Industry	₹6000 INR	\$200 USD

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The registration fee  
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[www.aies.sjcetpalai.ac.in](http://www.aies.sjcetpalai.ac.in)



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