PROCEEDINGS

2nd International Conference on Advances in Mechanical Engineering (ICAME-2018)

March 22-24, 2018

Organized by

Department of Mechanical Engineering
SRM Institute of Science & Technology
Kattankulathur, India.

CONVENER

Dr. S. Prabhu

CO-ORDINATORS

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Dr. T. Rajasekaran
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PROCEEDINGS

2nd International Conference on Advances in Mechanical Engineering (ICAME-2018)

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Chief-Editor
Dr. S. Prabhu

Editors
Dr. M. R. Stalin John
Dr. R. Senthil
Mrs. R. Ambigai
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PREFACE

The Department of Mechanical Engineering, SRM IST is proud to bring out the proceedings of the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) in printed and CD form. This is one of the most comprehensive Mechanical Engineering related conference to take place in India. The conference will be held during 22-24, March 2018 at the SRM Institute of Science and Technology, Kattankulathur.

ICAME 2018 focuses on a range of issues related to applied mechanics, bioengineering, and computer aided engineering and information technology processing, design and analysis, energy systems, etc. The purpose of the conference is to bring together the Multi-disciplinary community of engineers, scientists, and academics to discuss recent trends and future developments in Mechanical Engineering.

The conference features invited and contributed talks as well as poster sessions organized in different sessions. The invited speakers are globally recognized experts in the respective fields’ viz., Dr. Lung-Jieh Yang, Professor, Tamkang University, Dr. Se Jin Park, Korea Research Institute of Standards and Science, Daejeon, South Korea, Dr. Ing. Daniel Hahn, Research Director, German Center for advanced Engineering and Management Studies, Germany and Dr. R. Velraj, Professor & Director, and Institute for Energy Studies, Anna University.

More than 200 technical papers will be presented in the conference and the presented papers will be submitted as full manuscripts for possible publication in the technical journal IOP conference series: Material science and Engineering (ISSN: 1757-899X) and Journal of Applied Science and Engineering (ISSN: 1560-6686). The participants from various countries have contributed for these technical papers that will be presented during the conference. The main sponsors of this conference are Swam Equipment’s, RV Machine Tools and Micro Materials, UK and Nano Tec, Chennai.

The organizers are grateful to SRMIST for its financial assistance. The Department of Mechanical is particularly thankful to Dr. T.R Paarivendhar, Chancellor, Mr. Ravi Pachamoothoo, Chairman, Dr. P. Sathyarayanan, President, and Dr. R. Shivakumar, Vice President, SRMIST for their encouragement and full support for the success of the conference.

The organizing committee thanks the authorities, the Vice Chancellor, Pro-Vice Chancellor (P&D), Director (E&T), and the Dean (SME) SRMIST for their valuable, encouraging and motivating messages for the International conference.

Dr. S. Prabhu
CONVENER
ABOUT THE SRM IST

SRM IST is one of the top-ranking Universities and most premier engineering destinations in India, which is established in 1985 by the Founder Chancellor, Dr. T.R. Paarivendhar, SRM IST and now it is functioning in four campuses located at Kattankulathur, Vadapalani and Ramapuram in Tamilnadu and a fourth campus at Modi Nagar, Ghaziabad with over 38,000 students and 2,600 faculty members, offering wide range of undergraduate, post-graduate and doctoral programs in Engineering, Management, Medicine & Health Sciences, Law and Science & Humanities.

SRM IST has been engaged in nurturing minds through a rich heritage of academic excellence. Essentially a hub of bustling student activities, the green and beautiful campus has been a second home to thousands of students in their journey to challenge the times. The Institution has moved up through international alliances and collaborative initiatives to achieve global excellence. SRM IST collaborates with universities abroad involved in building a stronger international dimension in research and teaching methodology, which creates avenues for research and successful careers. The SRM IST also collaborates with foreign Universities like MIT, Carnegie Mellon University (CMU), and Pittsburg University etc.

Over 150 students sponsored to 35 foreign Universities like MIT, Carnegie Mellon, UC Davis, Warwick and Western Australia. Now the Institute enjoys an unsurpassed reputation in academia and corporate circles being the preferred manpower source for vision to be recognized as a world-class learning institution.

SRM IST has been categorized grade A University by Ministry of Human Resources Development (MHRD); Government of India.
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Dr. T. R. Paarivendhar
Founder Chancellor

I am extremely pleased and delighted to know that the Department of Mechanical Engineering, SRM Institute of Science and Technology, is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during 22-24, March 2018.

ICAME 2018 will provide a platform for students, faculty and researchers from academic & industry progress in the field of Materials, Robotics, Computer Aided Design, Thermal Engineering, Bio-Engineering and Manufacturing engineering etc.,

I hope that the ICAME 2018 shall inspire and ignite the young minds which would lead to the growth of knowledge, creativity and ultimately, greater benefit to the society. On this occasion, I am delighted to give a warm welcome to all the delegates and convey my best wishes to the organizers and all associated with activities of ICAME 2018.

I wish the conference a grand success.

Dr. T. R. Paarivendhar
Founder Chancellor

SRM Nagar, Kattankulathur - 603 203, Kancheepuram District, Tamil Nadu, India. Phone: +91-44-27454646, Fax: +91-44-27452343
Email: registrar@srmuniv.ac.in, Website: www.srmuniv.ac.in
MESSAGE

It is a pleasure that the Department of Mechanical Engineering is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during 22nd – 24th March 2018 at SRM Institute of Science and Technology, Kattankulathur.

I am informed that ICAME 2018 aims to attract the researchers from all over the world and provide a platform for them to interact about the recent advancement in the area of Mechanical Engineering.

On this occasion, I extend my heartfelt welcome to all participants of ICAME 2018 and a fruitful interaction.

I wish the conference a grand success.

President

SRM Nagar, Kattankulathur – 603203, Kancheepuram District, Tamil Nadu, India. Phone : +91 – 44 – 27454255 www.srmuniv.ac.in
Dr. T.P. Ganesan  
Pro VC (Planning and Development)  

MESSAGE  

I am very delighted to note that the Department of Mechanical Engineering is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during 22-24, March 2018 at SRM Institute of Science and Technology, Kattankulathur.  

The conference aims to promote cutting-edge research in current & futuristic areas on applied mechanics, manufacturing engineering, bio-engineering, robotics, computer aided engineering and information technology processing, design and analysis, energy systems etc., I am sure that, this platform will be an enriching experience for the participants and the confluence of ideas will develop solutions to the problems faced by the industry.  

I express my gratitude to the advisory committee, organizing committee, keynote speakers, session chairs, review committee and conference participants for making this conference a grand success.

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MESSAGE

I am happy to note that the Department of Mechanical Engineering is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during March 22-24, 2018 at SRM Institute of Science and Technology, Kattankulathur.

The purpose of the ICAME 2018 is to bring together the multi-disciplinary community of engineers, scientists, and academicians to discuss the recent trends and future developments in the area of advances in Mechanical Engineering which is very much relevant to the present day needs. This would help create better awareness among the participants in the conference, motivating them to go in for further research, development and innovations in advancing the technologies of interest.

It is also a pleasure to note that delegates from academia as well as industry from different regions are participating in the Conference which would ultimately bring a closer relationship between them and thereby pave the way for stronger Industry-Institution.

I wish the conference a grand success.

Dr. Sanjeev Sancheti
Vice Chancellor
SRM Institute of Science and Technology
SRM Nagar, Kattankulathur - 603 203,
Kancheepuram Dist, Tamil Nadu, India.
MESSAGE

I feel delighted to observe the efforts of the Department of Mechanical Engineering is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during 22-24, March 2018 at SRM Institute of Science and Technology, Kattankulathur.

ICAME 2018 will set a platform for academic scientists, leading engineers, researchers and students together to exchange and share their experiences and results about all aspects of Mechanical Engineering and discuss the practical challenges encountered to solve critical problems.

I would like to express my sincere appreciation to the organizing committee for their dedicated efforts to materialize the conference. I wish this conference to pave a new path towards attaining the best possible developments that would fulfil the demands of the fast growing economy of the country.

I wish the conference a grand success.

[Signature]

Director (Engg.&Tech.)

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SRM Institute of Science and Technology  
Faculty of Engineering & Technology  
School of Mechanical Engineering

D. Kingsly Jeba Singh  
Dean  
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MESSAGE

I am happy to note that the Department of Mechanical Engineering is organizing the 2nd International Conference on Advances in Mechanical Engineering (ICAME 2018) during 22-24, March 2018 at SRM Institute of Science and Technology, Kattankulathur.

ICAME 2018 will give a platform for our researchers and academicians to showcase their research findings and benefit from the deliberations. Such conferences will also help to build strong inter-institutional networks and pave way for synergy among the research community.

I would like to express my sincere appreciation to the organizing committee for their dedicated efforts to materialize the conference. I welcome the guests, delegates, experts and keynote speakers to the conference.

I wish the conference a grand success.

D. Kingsly Jeba Singh  
Dean, SME
ADVANCED ROBOTICS AND ITS IMPLEMENTATION IN INDIA

Dr.Ing.Daniel Hahn

Research Director, German Center for Advanced Engineering and Management Studies – IndoEuroSync,
52062 Aachen, Germany.
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Abstract

Industrial Robots are nowadays a precondition for the competition in the global market. Robots are successfully integrated in many different application areas like automotive, aerospace, chemistry, food and much more. India is not only one of the world biggest market for consumption, it is as well one of the biggest producer. However, the automation is low. The reason is, that India still faces a very young population which is satisfied with low salaries. Regarding other countries, one can make the prediction that these economic advantages might not last that long. The crucial question is now: how can India convert from current low salary economic situation into a high tech economy. This conversion is a long way and it starts within the education. Students must get enabled and encouraged for out-of-the-box thinking and getting into touch with newest technology. India has an enormous potential of knowledge hungry persons, however, this hungriness of the students should be satisfied in a proper way.

Possible ways are exposure to other countries during early semesters, followed by integrated courses from international and Indian experts. The concept with ARC from IES and APS is very promising with a virtual lab with Indian students solving and applying industrial tasks from current industrial challenges under the supervision of an expert. This encompassing methodology includes a permanent exchange with the German partner. Increased knowledge enhancement request a deepened face-to-face approach. One possibility is to create workshops with students where they have the ability to approve and probe their learned skills and knowledge. We propose faculty-crossing industry-oriented learning models where students go learning for Life-time, being encouraged about their skills, and forget catching credit points.
THE DEVELOPMENT OF FLAPPING MICRO AIR VEHICLE GOLDENSNITCH
AT TKU TAIWAN

Dr. Lung-Jieh Yang
Professor, Tamkang University.
Editor in Chief, Journal of Applied Science and Engineering

Abstract

Flapping wing micro air vehicles (FWMAVs) or ornithopters have several advantages compared with rotary and fixed wings because of their maneuverable, high power efficiency at low speed flight and durable. The invited talk presents the development of FWMAVs of 20 cm span and total weight less than 15 gram at Tamkang University, Taiwan. The real manufacture of several prototypes as well as their wind tunnel force measurement and numerical simulations are performed with flapping stroke angles of 53° and 90°, in diverse wind velocities ranging between 1-3 m/sec, and with flapping frequencies about 14-15 Hz. Some technical issues including autonomous flight control, avionics miniaturization, 3D flow simulation, and flow visualization will be also addressed.
INTELLIGENT REAL-TIME HEALTH MONITORING SYSTEM FOR OLDER ADULTS USING IOE (INTERNET OF EVERYTHING).

Dr. Se Jin Park
Korea Research Institute of Standards and Science, Daejeon, South Korea.
Electronics Telecommunication Research Institute, Daejeon, South Korea.
University of Science & Technology, Daejeon, South Korea.

Abstract

World population is ageing rapidly, and the aged population is getting much more concern nowadays. Aging originates from increasing longevity and results in deteriorating fertility. Age-related decline in cognitive function hampers safety and quality of life for an elder person. Hence, older adults need technological assistance for safe and healthy living in society. Internet of Everything (IoE) can provide the kind of support for the older adults which is significantly needed. Industry 4.0 is drastically changing value creation in every market; we discuss its potential impact in the healthcare industry. This talk would address one of our research activities “IoE based elderly health monitoring technology.” IoE based intelligent health monitoring system is considered most innovative technology which can measure physiological parameters of older adults during regular activities in real-time. IoE has numerous applications in healthcare including stroke disease. Stroke is most deadly diseases all over the world; it is a brain attack caused by interrupted blood supply or ruptured blood vessel in the parts of the brain. Emergency medical assistance is necessary to survive any disability caused by stroke. Intelligent real-time monitoring is desired to detect stroke onset during regular activities. IoE technology is capable of guiding older adults, generate alert and communicate with emergency service if any health abnormality happens.
AUGMENTING RENEWABLE POWER GENERATION THROUGH ENERGY STORAGE

Dr. R. Velraj
Professor & Director, Institute for Energy Studies, Anna University, Chennai -600025

Abstract

Renewable energy is one of the most effective tools we have in the fight against climate change, and there is every reason to believe it will succeed. India is striving to meet energy needs while being cognizant about climate change by advocating sustainable energy alternatives to fossil fuels and adopting ambitious targets for reducing greenhouse gas emissions through climate change policies. The various reasons that necessitates the local distributed power generation are (i) 300 million population of our country have no access to electricity (ii) 23% of generated electricity is lost during Transmission and Distribution in India, (iii) 40% of energy-related CO2 emissions is from electricity generation (iv) 30% of the Food products are spoiled/wasted due to lack of storage facility (v) 25% - 40% of total electricity supply costs from the network services.

The major Challenge associated with the promotion of renewable energy is due to its intermittent nature that creates mismatch between the supply and demand. There are various solutions available to overcome the said challenge through data generation, storage, control strategies, and policies. Among these, integrating the efficient storage technologies with the renewable power generation will be the ultimate solution to overcome the existing barriers. There are various types of storage devices that gained large importance in the recent years among the researchers. However, the optimized hybrid energy storage based on the various applications and the time dependent source of power generation will play a vital role to design the overall system in an economical way.
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