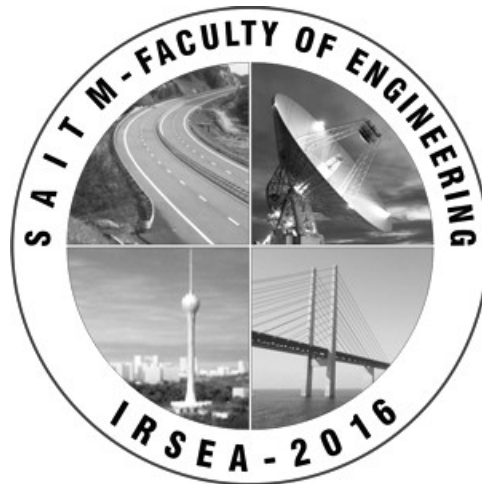


Proceedings of the 6th International Research Symposium on Engineering Advancements

IRSEA 2016

04th June, 2016



Faculty of Engineering

South Asian Institute of Technology and Medicine [SAITM]
P. O. Box 11, Millennium Drive, Off Chandrika Kumaratunga Mawatha, Malabe 10115, Sri Lanka.

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MESSAGE FROM THE CHAIRMAN

Dr. Neville Fernando MBBS (Ceylon)

President / Chairman

South Asian Institute of Technology and Medicine [SAITM]



It is with a great sense of pride that I note the holding of the 6th International Research Symposium on Engineering Advancements (IRSEA 2016) at SAIMT on the 04th of June 2016.

Organized by SAIMT faculty of engineering for the 6th consecutive time, this annual event has not only brought many researchers, academics and professionals from the industry together but also provided a forum for our students to participate and acquire knowledge and integrate with the scientific fraternity in Sri Lanka and abroad.

I would also like to take this opportunity to congratulate SAIMT faculty of engineering, which has progressed tremendously, to be considered a very respectable seat of learning in engineering in Sri Lanka, producing top quality engineers with the approval of the Ministry of Higher Education and I wish the faculty success in all the future endeavors.

MESSAGE FROM THE DEAN, FACULTY OF ENGINEERING, SAIMT

Dr. Sisuru Sendanayake B.Sc. Eng. (Hons), M.Sc., Ph.D.

Dean, Faculty of Engineering

South Asian Institute of Technology and Medicine [SAITM]



The International Research symposium on Engineering Advancements, 2016 (IRSEA'16) organized by SAIMT faculty of Engineering is our window to the engineering and scientific world. Acknowledging research, along with teaching and training, as one of the three main pillars on which successful education on engineering is based, the faculty has given pride of place to this annual event which is now in its 6th successful edition.

Inaugurated as a pioneering effort, IRSEA has shown tremendous growth and success in terms of content and quality over the years and has become a noticeable event among the engineering fraternity.

As a degree awarding institute offering Bachelor's degrees in Engineering under the approval of the Ministry of Higher Education in Sri Lanka, we view this international research symposium as a vehicle to give the much needed exposure and opportunity to our engineering undergraduates in honing their skills in research while providing a forum and a fertile ground to develop a network among all stakeholders in engineering in Sri Lanka, from the academic sector as well as from the industry, to share and advance knowledge.

Already, the fruits of earlier versions of SAIMT IRSEA are evident and I am happy to note the country has begun reaping the benefits in the form of highly skilled, world class graduates the faculty has produced over the years.

I wish to commend and appreciate Dr. Nandika Miguntanna, Chair, IRSEA'16, and all our academic and non academic staff attached to SAIMT faculty of engineering, partner organizations and students for their untiring efforts and dedication, contributing immensely to the success of the event.

MESSAGE FROM THE CONFERENCE CHAIR

Dr. N. P. Miguntanna B.Sc. Eng. (Hons)(Peradeniya), Ph.D. (QUT)

Head - Civil Engineering Research / Head - Department of Bio-Systems Engineering

South Asian Institute of Technology and Medicine [SAITM]



SAITM Annual International Research Symposium on Engineering Advancements (IRSEA) is one of the well known events of the country in the last five years. IRSEA is truly an inspiring event organized by the Faculty of Engineering at SAITM in order to foster and build strong partnerships with the industry and academia. Furthermore, the symposium also facilitates to present research activities carried out by SAITM engineering undergraduate students. It is indeed a great honor and privilege to serve as the chair of this symposium consecutively for the last five years as well as IRSEA 2016. It is certainly with a great pleasure I welcome all the participants to “SAITM- Sixth Annual International Research Symposium on Engineering Advancements – IRSEA 2016”.

I firmly believe that the last five research symposiums have been established as an important forum for researchers, academics, students of both state and non state sector higher education institutes and industrialists to share their knowledge of engineering and scientific challenges, practical barriers, theoretical developments and their applications to build a sustainable environment for future generations.

IRSEA 2016 framework has being designed to provide a multi disciplinary platform which comprises a number of emerging fields of engineering such as Structural Engineering and Finite Element Analysis, Highway Construction and Transportation Engineering, Renewable Energy, Consumption and Management, Water Resources and Environmental Engineering, Communication and Information Engineering, Image and Signal Processing, Quality Control and Management, Robotics, Control and Automation, Bio Systems Engineering with emphasis on Food and Bio Process Engineering and Town Planning and Urban Management. Furthermore, IRSEA 2016 features with a special session on "Ancient Built Environment in Sri Lanka: Engineering, Architecture, Sustainability and Archeological Investigations". IRSEA 2016 is graced by two keynote speeches and around fifty technical paper presentations followed by productive technical discussions.

I take this opportunity to convey my sincere thank to chief guest, keynote speakers, authors, members of the program committee, members of the technical committee, and all the generous sponsors for their relentless support, dedication and commitment which make IRSEA 2016 possible. I wish each of you successful deliberations, stimulating discussions, and finally a rewarding experience at IRSEA 2016.

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