

PREFACE

6th International Conference on Mechatronics 2017 (ICOM'17), was held from 8th-9th August 2017 at International Islamic University Malaysia (IIUM) Gombak Campus, Kuala Lumpur, Malaysia. The present volume contains papers from a selection from the invited and oral presentations.

ICOM is the regular international conference series in Malaysia. It was initially held at Kuala-lumpur bi-annual from 2008. ICOM is designed to bring together scientists, engineers researchers from a variety of disciplines engaged in applying platform for exchange of ideas on advances of mechatronics and their applications as well as to foster research network and worldwide collaboration. The scope of this conference ranges from basic research to Advanced instrumentation and control, and Robotics and automation studies. It is recognized as one of the comprehensive international conferences in the field of mechatronics engineering. An increasing number of young researchers present and exchange their innovative ideas on this friendly and professional platform, which has made ICOM a unique meeting in Kuala-Lumpur.

This year ICOM attracted distinguished scholars in the field of mechatronics from all over the world. The major topics covered at the conference and presented in this volume include: Intelligent systems, advanced instrumentation and control, signal and image processing, Machine vision, Human-machine interface, Robotics, Automation, Manufacturing mechatronics, Smart materials and structures, Sensors and actuators, Active vibration control, Computer and information technology, MEMS and NEMS, Biomechatronics and rehabilitation engineering, Mechatronics education, Autonomous systems, Energy and sustainability, Transportation systems, Fault detection and Machine learning. The conference voted for the three best student papers; awards were presented to the participant students whose posters were recognized as excellent and who took part in the oral presentation.

The Conference Secretariat and Local Organizing Committee deserve recognition for planning a smoothly run and productive conference with comprehensive, instructive lectures and innovative work. The faculties and students from International Islamic University Malaysia were dedicated to their work in reception and service during the conference. It is a pleasure to thank all of them for their efficient and



hard work. We are also grateful for the financial support from Kulliyyah of Engineering, Research Management Centre (RMC) of International Islamic University Malaysia.

Finally, we would like to thank all the authors for their contributions to COM'17 and all the members of the Committees for their cooperation and time spent reviewing submissions.

Editors

Rini Akmeliawati, Muhammad Mahbubur Rashid and Syamsul Bahrin Abdul Hamid

Conference Chairs

Syamsul Bahrin Abdul Hamid

6th International Conference on Mechatronics (ICOM'17)

8th-9th August 2017

Sponsored and Organized by

Kulliyyah of Engineering, International Islamic University Malaysia.

CONFERENCE COMMITTEES

Chairman	Syamsul Bahrin Abdul Hamid
Co-chairman	Tanveer Saleh
Secretary	Md. Mozasser Rahman Nadzril Sulaiman
Technical Committee	Md. Raisuddin Khan Amir Akramin Shafie Momoh -Jimoh Eyiomika Salami Shahrul Na'im Sidek Abd Halim Embong Noor Hazrin Hany Mohamad Hanif
Publication/Programme	Rini Akmeliawati Muhammad Mahbubur Rashid Nik Nur Wahidah Nik Hashim Salmiah Ahmad Siti Fauziah Toha@Tohara

	Asan Gani Abdul Muthalif Yasir Mohd Mustafah
Website and Publicity	Zaw Zaw Htike Ali Sophian Ahmad Imran Ibrahim Ahmad Jazlan Haja Mohideen
International Advisory Board and Keynote Speakers	Tanveer Saleh Iskandar Al-Thani Mahmood Zukifli Zainal Abidin Rini Akmeliawati Amir Akramin Shafie Md. Raisuddin Khan Momoh -Jimoh Eyiomika Salami Nadzril Sulaiman
Finance, Treasurer and Sponsorship	Amir Akramin Shafie Zukifli Zainal Abidin Sharifah Junita Syed Idrus
Souvenir	Norsinnira Zainul Azlan Ahmad Imran Ibrahim
Registration/Payment	Hazlina Md. Yusof Wahju Sediono
Local arrangement and accommodation	Sharifah Junita Syed Idrus

International Advisory Board

Aysegul Ucar (Firat University, Turkey)

Bambang Riyanto Trilaksono (Institut Teknologi Bandung, Indonesia)

Dina S. Laila (Coventry University, UK)

Endra Joelianto (Institut Teknologi Bandung, Indonesia)

Essameddin Badreddin (Universitat Heidelberg, Germany)

Ismaila Tijani (Higher Colleges of Technology, UAE)

Khansa Bdirina (University of Djelfa, Algeria)

Lafifa Jamal (University of Dhaka, Bangladesh)

Mahmoud Shafik (University of Derby, UK)

Man Zhi Hong (Swinburne University of Technology, Australia)

Mohamed Trabia (University of Nevada, Las Vegas, USA)

Mohammad Ali (Bangladesh University of Engineering and Technology, Bangladesh)

Mohammad Habibur Rahman (University of Wisconsin-Milwaukee, USA)

Mounir Bouhedda (Dr. Yahia Fares University of Médéa, Algeria)

Prashanta Dutta (Washington State University, USA)

Qudrat Khan (COMSATS Institute of Information Technology, Pakistan)

Toshio Fukuda (Nagoya University, Japan)

Winda Astuti (Bina Nusantara University, Indonesia) Baoyong Zheng, Hua Wei Technologies Corporation, Inc (China)

Keynote Speakers

Prof. Manukid Parnichkun (AIT Thailand)

Prof. Dr.sc.techn. Essam Badreddin (University of Heidelberg, Germany)

Prof. Prashanta Dutta (University of South Carolina and Texas A&M University USA)