

<b>July 1 Sunday</b>	Room 1	Room 2	Room 3	Front Desk
17:00-19:00	Get-Together Event			17:00-19:00 Registration

<b>July 2 Monday</b>	Room 1	Room 2	Room 3	Front Desk
09:30-10:00	MESA-M-O1			08:00-16:40 Registration
10:00-10:30	Coffee Break			
10:30-11:30	MESA-M-K1			
11:30-12:50	Lunch Break			
12:50-14:30	MESA-M-1-T1	MESA-M-2-T1	MESA-M-3-T1	
14:30-15:00	Coffee Break			
15:00-16:20	MESA-M-1-T2	MESA-M-2-T2	MESA-M-3-T2	

<b>July 3 Tuesday</b>	Room 1	Room 2	Room 3	Front Desk
08:30-09:30	MESA-T-1-T1	MESA-T-2-T1		08:00-12:00 Registration
09:30 -10:00	Coffee Break			
10:00-11:00	MESA-T-K2			
11:00-12:30	Lunch Break			
12:30-16:40	MESA2018 T-E1			
16:40-17:40	MESA-T-C1			
19:00	Conference Dinner			

<b>July 4 Wednesday</b>	Room 1	Room 2	Room 3	Front Desk
08:30-09:50	MESA-W-1-T1	MESA-W-2-T1	MESA-W-3-T1	08:00-12:00 Registration
09:50-10:20	Coffee Break			
10:20-12:00	MESA-W-1-T2	MESA-W-2-T2	MESA-W-3-T2	
12:00-13:15	Lunch Break			
13:15-14:00	MESA-W-1-C1			

**July 2 Monday, Room 1 (09:30-11:30)**

Time	Session ID	Chair(s)	Title	Author(s)
09:30-10:00	MESA-M-O1 Opening Session	Tapio Heikkilä	Welcome to MESA 2018	
10:30-11:30	MESA-M-K1 KEYNOTE 1	Tapio Heikkilä, Po Ting Lin	Face Analysis for Emotional Interfaces	Matti Pietikäinen

**July 2 Monday, Technical Sessions, Room 1 (12:50-14:30)**

Session ID	MESA-M-1-T1 Artificial Intelligence and Emerging Technologies for Mechatronic and Embedded Systems		
Chair(s)			
Time	Paper ID Title	Author(s)	
12:50-13:10	1570429240 Flexible Signals and Images Lossless Compression Chip Design for IoT and Industry 4.0	<u>Shih-Lun Chen</u> and Tsun-Kuang Chi (Chung Yuan Christian University, Taiwan); Chiung-An Chen (Ming Chi University of Technology, Taiwan); Chi-Hao Liao and Ting-Lan Lin (Chung Yuan Christian University, Taiwan)	
13:10-13:30	1570435036 Century of manual remote control, automation, autonomy, and self-organization	<u>Aarne O Mämmelä</u> (VTT, Finland); Jukka Riekkö (University of Oulu, Finland)	
13:30-13:50	1570436892 Preventive Maintenance of Motors and Automatic Classification of Defects using Artificial Intelligence	<u>Ching-Yuan Chang</u> , Jyun-You Hong and Wei-Chieh Chang (National Taipei University of Technology, Taiwan)	
13:50-14:10	1570437147 A Synergic Photometric Stereo and Super Resolution Approach for Optical Inspection	<u>Alessandro Galdelli</u> (Università Politecnica delle Marche, Italy); Adriano Mancini (Dipartimento di Ingegneria dell'Informazione, Università Politecnica delle Marche, Italy); Emanuele Frontoni and Primo Zingaretti (Università Politecnica delle Marche, Italy)	
14:10-14:30	1570445367 Intelligent Control for Lower Limb Rehabilitation System	<u>Chin-Sheng Chen</u> (National Taipei University of Technology, Taiwan); Ming-Shium Hsieh (En Chu Kong Hospital, Taiwan); Feng-Chi Lee (Industrial Technology Research Institute, Taiwan); Yu-Hsin Lin (Shuz Tung Machinery Industrial Co., Ltd., Taiwan)	

**July 2 Monday, Technical Sessions, Room 2 (12:50-14:30)**

Session ID	MESA-M-2-T1 Sensors and Actuators #1		
Chair(s)			
Time	Paper ID Title	Author(s)	

12:50-13:10	1570435204 Industrial Environment Mapping Using Distributed Static 3D Sensor Nodes	<u>Atle Aalerud</u> (University of Agder & National Oilwell Varco, Norway); Joacim Dybedal, Erind Ujkani and Geir Hovland (University of Agder, Norway)
13:10-13:30	1570435512 Simulation Analysis and Performance Evaluation of a Vibratory Feeder Actuated by Dielectric Elastomers	<u>Andrea Bonci</u> , Sauro Longhi, Massimiliano Pirani and Emanuele Lorenzoni (Università Politecnica delle Marche, Italy); Gianluca Rizzello (Saarland University, Germany); David Naso (Polytechnic University of Bari, Italy); Stefan Seelecke (Saarland University, Saarbrücken, Italy)
13:30-13:50	1570436352 2-DOF in-Plane Displacement Measurement by Wollaston Prism-based Interferometer	Hung-Lin Hsieh, Bo-Yen Sun and Gang-Yu Fan (National Taiwan University of Science and Technology, Taiwan); <u>JuYi Lee</u> (National Central University, Taiwan)
13:50-14:10	1570435408 RMAS: Relational Multiagent System for CPS Prototyping and Programming	<u>Andrea Bonci</u> , Massimiliano Pirani, Carlo Bianconi and Sauro Longhi (Università Politecnica delle Marche, Italy)
14:10-14:30	1570438222 Filtering Scheme for Context-Aware Fog Computing in Cyber-Physical Systems	Teemu Mononen, <u>Mohammad M. Aref</u> and Jouni Mattila (Tampere University of Technology, Finland)

### July 2 Monday, Technical Sessions, Room 3 (12:50-14:30)

Session ID	MESA-M-3-T1 Mechatronics and Embedded Systems Applications	
Chair(s)		
Time	Paper ID Title	Author(s)
12:50-13:10	1570428258 Accelerating Viterbi Algorithm using Custom Instruction Approach	<u>Waqar Ahmad</u> (Concordia University, Canada); Imran Abbasi (National University of Sciences and Technology, Pakistan); Hasan Mahmood (Quaid-i-Azam University, Islamabad, Pakistan)
13:10-13:30	1570434355 Validation of a Nonlinear Two-dimensional MacPherson Suspension System Model with Multibody Simulations	Atte Rankinen, Enso Ikonen and <u>Toni Liedes</u> (University of Oulu, Finland)
13:30-13:50	1570438341 Shake Table Testing of a Radar-Based Structural Health Monitoring Method	<u>Alexander Amies</u> , Christopher Pretty, Geoff Chase and Geoffrey Rodgers (University of Canterbury, New Zealand)
13:50-14:10	1570443431 Design, Development and Experimental Evaluation of a Vortex Actuation System	<u>George Andrikopoulos</u> and George Nikolakopoulos (Luleå University of Technology, Sweden)

14:10-14:30	1570435594 Handling Process Overruns and Underruns on Multiprocessors in a Fault- Tolerant Real-Time Embedded System	<u>Jia Xu</u> (York University, Canada)
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**July 2 Monday, Technical Sessions, Room 1 (15:00-16:20)**

Session ID	MESA-M-1-T2 Mechatronics and Industry 4.0	
Chair(s)		
Time	Paper ID Title	Author(s)
15:00-15:20	1570405807 How End Effector Absolute Accuracy Plays A Role in Industry 4.0	<u>Po Ting Lin</u> (National Taiwan University of Science and Technology, Taiwan); Po-Chun Juan (Chung Yuan Christian University, Taiwan); Shu-Ping Lin, Wei-Hao Lu and Zai- Gen Wu (National Taiwan University of Science and Technology, Taiwan)
15:20-15:40	1570429973 Design of an intelligent module for hydrostatic bearing	ChoYu Yang (National Tsin Hua University, Taiwan); YiFeng Chang, ChinWen Cheng and <u>Cheng-Kuo Sung</u> (National Tsing Hua University, Taiwan)
15:40-16:00	1570435459 Role-based visualization of industrial IoT-based systems	<u>Mehdi Mahmoodpour</u> , Andrei Lobov and Minna Lanz (Tampere University of Technology, Finland), Petteri M'akel'a, Niko Rundas (Sein'ajoki University of Applied Sciences)
16:00-16:20	1570435838 Machine Learning approach for Predictive Maintenance in Industry 4.0	<u>Marina Paolanti</u> (Università Politecnica delle Marche, Italy); Luca Romeo (Universita' Politecnica delle Marche, Italy); Andrea Felicetti (Università Politecnica delle Marche, Italy); Jelena Loncarski (Uppsala University, Italy); Adriano Mancini and Emanuele Frontoni (Università Politecnica delle Marche, Italy)

**July 2 Monday, Technical Sessions, Room 2 (15:00-16:20)**

Session ID	MESA-M-2-T2 Diagnosis and Monitoring in Mechatronic Systems	
Chair(s)		
Time	Paper ID Title	Author(s)
15:00-15:20	1570427363 Sensor-embedded Linear Ball Bearing for Linear Guide Way Pre-load and Straightness Monitoring	<u>Chih-Chun Cheng</u> (National Chung Cheng University & Advanced Institute of Manufacturing with High-tech Innovations, Taiwan); Wen-Nan Cheng and Mun-Jane Liao (National Chung Cheng University, Taiwan); Cheng-Kuo Sung (National Tsing Hua University, Taiwan)

15:20-15:40	1570428003 The sensing technology of applying the acoustic emission sensor to the grinding wheel loading phenomenon	<u>Chien-Sheng Liu</u> and Yu-An Li (National Chung Cheng University, Taiwan)
15:40-16:00	1570437795 Fault Detection, Diagnosis and Fault Tolerant Output Control for a Remotely Operated Vehicle	<u>Alessandro Baldini</u> (Universita' Politecnica delle Marche, Italy); Antonio Fasano (University of Rome "La Sapienza" & University of Rome "Campus Bio-Medico", Italy); <u>Riccardo Felicetti</u> , Alessandro Freddi, Sauro Longhi and Andrea Moneriù (Università Politecnica delle Marche, Italy)
16:00-16:20	1570438251 Kinematic Fault Tolerant Control of a Dual-Arm Robotic System Under Torque Faults	<u>Alessandro Freddi</u> , Sauro Longhi and Andrea Moneriù (Università Politecnica delle Marche, Italy); Davide Orteni (Università di Bologna, Italy); Daniele Proietti Pagnotta (Universita' Politecnica delle Marche, Italy)

**July 2 Monday, Technical Sessions, Room 3 (15:00-16:20)**

Session ID	MESA-M-3-T2 Robotics and Mobile Machines #1	
Chair(s)		
Time	Paper ID Title	Author(s)
15:00-15:20	1570434911 Performance Analysis of a High-Speed Redundant Robot	<u>Massimo Callegari</u> , Giacomo Palmieri and Matteo Palpacelli (Polytechnic University of Marche, Italy); Roberto Bussola and Giovanni Legnani (University of Brescia, Italy)
15:20-15:40	1570435170 Robot skills - modeling and control aspects	<u>Tapio Heikkilä</u> (Technical Research Centre of Finland, Finland); Jari Ahola (VTT Technical Research Centre of Finland, Finland)
15:40-16:00	1570435215 Spline-based energy-optimal trajectory planning for functionally redundant robots	<u>Paolo Boscarol</u> and Dario Richiedei (Università degli Studi di Padova, Italy)
16:00-16:20	1570435439 Inertial Sensor-Based State Estimation of Flexible Links Subject to Bending and Torsion	<u>Petri Mäkinen</u> , Teemu Mononen and Jouni Mattila (Tampere University of Technology, Finland)

**July 3 Tuesday, Technical Sessions, Room 1 (08:30-09:30)**

Session ID	MESA-T-1-T1 Micro-/Nano-Manipulation Technologies and Applications	
Chair(s)		
Time	Paper ID Title	Author(s)
08:30-08:50	1570435332 Robust tracking control of an XY compliant nanomanipulator with variable loads	Xiaodong Yang and <u>Zhen Zhang</u> (Tsinghua University, P.R. China); Yiingchun Guan (Beihang University, P.R. China)
08:50-09:10	1570438135 Smith Predictor Based $H_{\infty}$ Control for Piezoelectric Nano Stages with Time Delays	Zhiming Zhang and <u>Peng Yan</u> (Shandong University, P.R. China)
09:10-09:30	1570438141 Improved particle swarm optimization for fast block matching with application to motion estimation in micro/nano systems	<u>Gaozhao Su</u> , Guoliang Lu and Peng Yan (Shandong University, P.R. China)

**July 3 Tuesday, Technical Sessions, Room 2 (08:30-09:30)**

Session ID	MESA-T-2-T1 Mechatronic and Embedded Technologies in Intelligent Transportation Systems	
Chair(s)		
Time	Paper ID Title	Author(s)
08:30-08:50	1570435105 Study of Optimization of Air Route Networks and Locations of Crossing Waypoints for SEA	<u>Zhao-Wei Zhong</u> and Jian-Hui Richard Yee (Nanyang Technological University, Singapore)
08:50-09:10	1570435530 On the Traction control of Single-Track Vehicles in different trim conditions	<u>Andrea Bonci</u> , Riccardo De Amicis, Sauro Longhi and Emanuele Lorenzoni (Università Politecnica delle Marche, Italy)
09:10-09:30	1570435540 A Smooth Traction Control Design for Two-Wheeled electric vehicles	<u>Andrea Bonci</u> , Riccardo De Amicis, Sauro Longhi and Emanuele Lorenzoni (Università Politecnica delle Marche, Italy)

**July 3 Tuesday, Room 1 (10:00-11:00)**

Time	Session ID	Chair(s)	Title	Author(s)
10:00-11:00	MESA-M-K2 KEYNOTE 2	George Nikolakopoulos	Cooperative Unmanned Aerial Systems for Area Coverage	Antonio Tzes

**July 3 Tuesday, (12:30-16:40)**

Time	Session ID
12:30-16:40	MESA2018 T-E1 Local Excursion

**July 3 Tuesday, Room 1 (16:40-17:40)**

Time	Session ID
16:40-17:40	MESA-T-C1 Technical Committee Meeting

**July 4 Wednesday, Technical Sessions, Room 1 (08:30-09:50)**

Session ID	MESA-W-1-T1 Bio-Mechatronics - Medical Devices & Technologies	
Chair(s)		
Time	Paper ID Title	Author(s)
08:30-08:50	1570434827 Biomechanical Design and Control of Lower Limb Exoskeleton for Sit-to-Stand and Stand-to-Sit Movements	<u>Muhammad Umer Khan</u> (Atilim University, Ankara, Turkey); Muhammad Hamza Qureshi, Zeeshan Masood, Linta Rehman and Muhammad Owais (Air University, Pakistan)
08:50-09:10	1570435293 A Robust Method of Peak Detection in Noisy PPG Signals Using a Structure of IIR Filters	<u>Jake Campbell</u> , Christopher Pretty, Geoff Chase and Phil Bones (University of Canterbury, New Zealand)
09:10-09:30	1570435312 Crosstalk Reduction in Forearm Electromyography During Static Gripping	<u>Ben Fortune</u> , Lachlan McKenzie, Logan Chatfield and Christopher Pretty (University of Canterbury, New Zealand)
09:30-09:50	1570435841 Machine learning-based approaches to analyse and improve the diagnosis of endothelial dysfunction	Chiara Calamanti and <u>Marina Paolanti</u> (Università Politecnica delle Marche, Italy); Luca Romeo (Università Politecnica delle Marche, Italy); Michele Bernardini (Università Politecnica delle Marche, Italy); Emanuele Frontoni (Università Politecnica delle Marche, Italy)

**July 4 Wednesday, Technical Sessions, Room 2 (08:30-09:50)**

Session ID	MESA-W-2-T1 Mechatronic Control and Electrical Vehicular Systems #1	
Chair(s)		
Time	Paper ID Title	Author(s)
08:30-08:50	1570435393 Questions regarding vehicle safety and the mathematical analysis of safety in large scale networks using positive dynamic systems and probability theory methods	<u>Ferenc Szauter</u> (Research Center of Vehicle Industry, Hungary)
08:50-09:10	1570437655 Recent Advance of Hybrid Energy Storage Systems for Electrified Vehicles	<u>Jiajun Liu</u> and Zuomin Dong (University of Victoria, Canada); Tianxu Jin (University of Science and Technology Beijing, P.R. China); Li Liu (School of Mechanical Engineering, University of Science & Technology Beijing, P.R. China)
09:10-09:30	1570438377 Modeling and Simulation of Hybrid Electric Ships with AC Power Bus - A Case Study	<u>Hongbo Zhu</u> and Zuomin Dong (University of Victoria, Canada)



09:30-09:50	1570438350 Error analysis of numerical Weyl fractional derivatives in the case of certain Hölder continuous functions	<u>Juhani Nissilä</u> (University of Oulu, Finland)
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#### July 4 Wednesday, Technical Sessions, Room 3 (08:30-09:50)

Session ID	MESA-W-3-T1 Robotics and Mobile Machines #2	
Chair(s)		
Time	Paper ID Title	Author(s)
08:30-08:50	1570435494 Experimental Setup for the Validation of the Bio-Inspired Thruster of an Ostraciiform Swimming Robot	Daniele Costa (Università Politecnica delle Marche, Italy); Maurizio Brocchini, <u>Massimo Callegari</u> , Giacomo Palmieri, David Scaradozzi and Gianluca Zitti (Polytechnic University of Marche, Italy)
08:50-09:10	1570435505 Visual Marker Guided Point Cloud Registration in a Large Multi-Sensor Industrial Robot Cell	<u>Erind Ujkani</u> and Joacim Dybedal (University of Agder, Norway); Atle Aalerud (University of Agder & National Oilwell Varco, Norway); Knut Kaldestad and Geir Hovland (University of Agder, Norway)
09:10-09:30	1570435531 Functional Design of Elloboat, a Tracked Vehicle for Launching and Beaching of Watercrafts and Small Boats	Giovanni Otonello (Ellotech Srl, Italy); Giovanni Berselli (University of Genova, Italy); <u>Luca Bruzzone</u> and Pietro Fanghella (University of Genoa, Italy)
09:30-09:50	1570438040 Scalability of GPU-Processed 3D Distance Maps for Industrial Environments	<u>Atle Aalerud</u> (University of Agder & National Oilwell Varco, Norway); Joacim Dybedal and Geir Hovland (University of Agder, Norway)

#### July 4 Wednesday, Technical Sessions, Room 1 (10:20-12:00)

Session ID	MESA-W-1-T2 Sensors and Actuators #2	
Chair(s)		
Time	Paper ID Title	Author(s)
10:20-10:40	1570428962 Effects of DAC interpolation on the dynamics of a high speed linear actuator	<u>Francesco Aggogeri</u> and Alberto Borboni (Università degli Studi di Brescia, Italy); Mario Terzo and Salvatore Strano (University of Naples Federico II, Italy)
10:40-11:00	1570432849 Nonlinear Model Based Control of MEMS Micro-Mirror	<u>Yonghong Tan</u> (Shanghai Normal University, P.R. China); Ruili Dong (Donghua University, P.R. China)

11:00-11:20	1570435183 Low-Power Wake-Up System based on Frequency Analysis for Environmental Internet of Things	<u>Manon Fourniol</u> (Aix Marseille Université & IM2NP, France); Valentin Gies (Université de Toulon, France); Valentin Barchasz (SMIOT & Université de Toulon, France); Edith Kussener (IM2NP/ISEN Toulon, France); Herve Barthelemy (Ecole Polytechnique Universitaire de Marseille, France); Remy Vauche (Aix-Marseille University, IM2NP, France); Hervé Glotin (Université du Sud Toulon-Var / LSIS, France)
11:20-11:40	1570436854 Multi-Robot Coordination Through Mobile Agent	<u>Binsen Qian</u> and Harry Cheng (University of California, Davis, USA)
11:40-12:00	1570437156 An IoT Solution for Energy Management at Building and District Level	<u>Marco Arnesano</u> , Jack Dyson and Marco Fagiani (Università Politecnica delle Marche, Italy); Adriano Mancini (Dipartimento di Ingegneria dell'Informazione, Università Politecnica delle Marche, Italy); Gian Marco Revel, Marco Severini, Stefano Squartini, Lorenzo Zampetti and Primo Zingaretti (Università Politecnica delle Marche, Italy)

#### July 4 Wednesday, Technical Sessions, Room 2 (10:20-12:00)

Session ID	MESA-W-2-T2 Mechatronic Control and Electrical Vehicular Systems #2	
Chair(s)		
Time	Paper ID Title	Author(s)
10:20-10:40	1570429028 Control design of an electro-pneumatic gearbox actuator	<u>Adam Szabo</u> and Tamás Bécsi (Budapest University of Technology and Economics, Hungary); Péter Gáspár (Computer and Automation Research Institute of Hungarian Academy of Sciences, Hungary); Szilárd Aradi (Budapest University of Technology and Economics, Hungary)
10:40-11:00	1570434765 Optimal Map-Based Mode Selection and Powertrain Control for a Multi-Mode Plug-in Hybrid Electric Vehicle	<u>Huangqing Wang</u> , Kovid Satcheva, Joe Tripp, Bo Chen, Darrell Robinette and Mahdi Shahbakhti (Michigan Technological University, USA)
11:00-11:20	1570435137 Research of vehicle parameter and sensor systems necessary to control autonomous vehicles	<u>Gabor Szakállas</u> (Szechenyi Istvan University, Hungary)
11:20-11:40	1570429099 Lateral control approach of powered parafoils combining wind feedforward compensation with active disturbance rejection control	<u>Shuzhen Luo</u> , Qinglin Sun, Mingwei Sun, Hao Sun, Wannan Wu and Zeng-Qiang Chen (Nankai University, P.R. China)

11:40-12:00	1570431054 A research on the state identification and control method based on extended state observer	<u>ZhenYan Wei</u> (Beihang University, P.R. China)
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**July 4 Wednesday, Technical Sessions, Room 3 (10:20-12:00)**

Session ID	MESA-W-3-T2 Robotics and Mobile Machines #3	
Chair(s)		
Time	Paper ID Title	Author(s)
10:20-10:40	1570438280 Mobile Robotic Spatial Odometry by Low-Cost IMUs	<u>Xiaolong Zhang</u> , Teemu Mononen, Mohammad M. Aref and Jouni Mattila (Tampere University of Technology, Finland)
10:40-11:00	1570438344 Real-time and Robust Collaborative Robot Motion Control with Microsoft Kinect v2	<u>Burak Teke</u> , Minna Lanz, Joni Kämäräinen and Antti Hietanen (Tampere University of Technology, Finland)
11:00-11:20	1570438473 Wearable Device to Record Hand Motions based on EMG and Visual Information	<u>Gustavo Garcia Ricardez</u> and Atsushi Ito (Nara Institute of Science and Technology, Japan); Masahiro Yoshikawa (Osaka Institute of Technology, Japan); Ming Ding and Jun Takamatsu (Nara Institute of Science and Technology, Japan); Yoshio Matsumoto (National Institute of Advanced Industrial Science and Technology, Japan); Tsukasa Ogasawara (Nara Institute of Science and Technology, Japan)
11:20-11:40	1570428655 Mobile Robotic Platforms to Support Smart Farming Efforts at UMES	<u>Abhijit Nagchaudhuri</u> (University of Maryland Eastern Shore & Engineering and Aviation Complex, USA); Madhumi Mitra, Christopher Hartman, Travis Ford and Jesuraj Pandya (University of Maryland Eastern Shore, USA)
11:40-12:00	1570438299 Scalable Autonomous Agronomical Smartbot	<u>Achala C. Athukorala</u> , Nipuna Ranasinghe, Kosala Herath, Peshala Jayasekara and Thilina Lalitharatne (University of Moratuwa, Sri Lanka)

**July 4 Wednesday, Room 1 (13:15-14:00)**

Time	Session ID	Chair(s)	Title	
13:15-14:00	MESA-M-C1 Closing Session	Tapio Heikkilä	Awards & closing MESA 2018	