2018 IEEE/ASME International Conference on Advanced Intelligent Mechatronics

July 9 – 12, 2018
Auckland, New Zealand

Technical Sponsorship Organizations

Technical Program at a Glance

AIM 2018 Technical Program Monday July 9, 2018

Track T1
09:00-10:15 MoWAM_AT1 301-G050 A Biologically Inspired Tactile System for Robotics (Morning Session A)
10:15-10:45 MoTeaBreakAMT1 302-G60 & G80 (Foyer)
10:45-12:00 MoWAM_BT1 301-G050 A Biologically Inspired Tactile System for Robotics (Morning Session B)
13:00-14:15 MoWPM_AT1 301-G050 New Frontiers in Biomechatronics: From Brain Machine Interfaces to Assistive and Rehabilitation Robotics (Afternoon Session A)
14:15-14:45 MoTeaBreakPMT1 302-G60 & G80 (Foyer)
14:45-16:00 MoWPM_BT1 301-G050 New Frontiers in Biomechatronics: From Brain Machine Interfaces to Assistive and Rehabilitation Robotics (Afternoon Session B)
17:00-18:00 MoWelcomeFunctionT1 302-G60 & G80 (Foyer)

AIM 2018 Technical Program Tuesday July 10, 2018

Track T1	Track T2	Track T3	Track T4	Track T5	Track T6
08:50-09:00 TuOP1 109-B28 Opening Session					
09:00-10:30 TuPP1 109-B28 Plenary Session 1					
10:30-11:00 TuAMTeaAM 302-G60 & G80 (Foyer)					
11:00-13:00 TuAT1 301-G050 Human Machine Interfaces 1	11:00-13:00 TuAT2 303-G13 Robot Dynamics and Control	11:00-13:00 TuAT3 303-G16 Identification and Estimation in Mechatronics 1	11:00-13:00 TuAT4 303-G14 Actuators 1	11:00-13:00 TuAT5 302-G20 Design and Control of Micro and Nano Precision Mechatronic Systems	11:00-13:00 TuAT6 301-G053 Artificial Intelligence and Machine Learning
13:00-14:00 TuLunchAM 302-G60 & G80 (Foyer)					
14:00-16:40 TuBT1 301-G050 Medical Robotics & Biomechatronics	14:00-16:40 TuBT2 303-G13 Motion, Vibration and Noise Control	14:00-16:40 TuBT3 303-G16 Sensors and Sensing Systems 1	14:00-16:40 TuBT4 303-G14 Flexible Manipulators and Structures 1	14:00-16:40 TuBT5 302-G20 Power MEMS for Intelligent Internet of Things	14:00-16:40 TuBT6 301-G053 Modeling, Design & Optimization in Mechatronics 1
16:40-17:40 TuPMTeaBreak_Poster 302-G60 & G80 (Foyer) Poster Session					

AIM 2018 Technical Program Wednesday July 11, 2018

Track T1	Track T2	Track T3	Track T4	Track T5	Track T6
09:15-10:00 WPP1 109-B28 Plenary Session 2					
10:00-10:30 WAMTeaBreak 302-G60 & G80 (Foyer)					
10:30-12:30 WAT1 301-G050 Emerging Technologies in Bio-Mechatronic Rehabilitation Robotics	10:30-12:30 WAT2 303-G13 Unmanned Aerial Vehicles	10:30-12:30 WAT3 303-G16 Sensing and Robotics for Coverage Optimization	10:30-12:30 WAT4 303-G14 Actuators 2	10:30-12:30 WAT5 302-G20 MEMS and Nano Devices	10:30-12:30 WAT6 301-G053 Learning and Neural Control in Mechatronics
12:30-13:30 WLunchBreak 302-G60 & G80 (Foyer)					
13:30-15:30 WBT1 301-G050 Human Machine Interfaces 2	13:30-15:30 WBT2 303-G13 Mobile Robots 1	13:30-15:30 WBT3 303-G16 Sensors and Sensing Systems 2	13:30-15:30 WBT4 303-G14 Flexible Manipulators and Structures 2	13:30-15:30 WBT5 302-G20 Energy Harvesting for Self-Powered Health Monitoring	13:30-15:30 WBT6 301-G053 Manufacturing
15:30-16:00 WPMTeaBreak 302-G60 & G80 (Foyer)					
16:00-18:00 WCT1 301-G050 Rehabilitation Robots 1	16:00-18:00 WCT2 303-G13 Underwater Robotics	16:00-18:00 WCT3 303-G16 Path Planning, Navigation and Space Exploration	16:00-18:00 WCT4 303-G14 Pneumatic Actuated Systems	16:00-18:00 WCT5 302-G20 Micro/Nano Manipulation	16:00-18:00 WCT6 301-G053 Modeling, Design & Optimization in Mechatronics 2
19:00-21:00 WConferenceDinner Auckland Museum					

AIM 2018 Technical Program Thursday July 12, 2018

Track T1	Track T2	Track T3	Track T4	Track T5	Track T6
09:15-10:00 ThPP1 109-B28 Plenary Session 3					
10:00-10:30 ThAMTeaBreak 302-G60 & G80 (Foyer)					
10:30-12:30 ThAT1 301-G050 Physical Human-Robot Interactions and Human Assistive Systems	10:30-12:30 ThAT2 303-G13 Mobile Robots 2	10:30-12:30 ThAT3 303-G16 Fault Detection and Diagnosis	10:30-12:30 ThAT4 303-G14 Actuators 3	10:30-12:30 ThAT5 302-G20 Control, Simulation and Condition Monitoring for Electromechanical Systems	10:30-12:30 ThAT6 301-G053 Image Processing and Machine Vision
12:30-13:30 ThLunchBreak 302-G60 & G80 (Foyer)					
13:30-15:30 ThBT1 301-G050 Rehabilitation Robots 2	13:30-15:30 ThBT2 303-G13 Legged Robots	13:30-15:30 ThBT3 303-G16 Identification and Estimation in Mechatronics 2	13:30-15:30 ThBT4 303-G14 Control Application in Mechatronics	13:30-15:30 ThBT5 302-G20 Energy Harvesting	13:30-15:30 ThBT6 301-G053 Modeling, Design & Optimization in Mechatronics 3
15:30-16:00 ThPMTeaBreak 302-G60 & G80 (Foyer)					
16:00-17:20 ThCT1 301-G050 No session	16:00-17:20 ThCT2 303-G13 Vehicle Control	16:00-17:20 ThCT3 303-G16 No session	16:00-17:20 ThCT4 303-G14 No session	16:00-17:20 ThCT5 302-G20 No session	16:00-17:20 ThCT6 301-G053 AI-Enabled Intelligent Systems in Smart Manufacturing and Automation
17:20-17:30 ThClosingCeremony 302-G60 & G80 (Foyer)					

Book of Abstracts of 2018 IEEE/ASME International Conference on Advanced Mechatronics (AIM)

Technical Program for Monday July 9, 2018

Workshops

09:00 – 12:00 ROOM 301-G050

A Biologically Inspired Tactile System for Robotics (Morning Session A and B)
S. Kukreja, A/Director of Robotics, United Technologies Research Center East Hartford, CT, USA
J. Ryde, Staff Engineer, United Technologies Research Center, Berkeley, CA, USA

13:00 – 16:00 ROOM 301-G050

New Frontiers in Biomechatronics: From Brain Machine Interfaces to Assistive and Rehabilitation Robotics (Afternoon Session A and B)
Dr. Luke Hallum, The University of Auckland, Auckland, New Zealand
Dr. Minas Liarokapis, The University of Auckland, Auckland, New Zealand
Dr. Andrew McDaid, The University of Auckland, Auckland, New Zealand

Technical Program for Tuesday July 10, 2018

Plenary Talk 1 ROOM 109-B28 Chair: Aw, Kean
09:00 – 09:45 Co-Chair: Tang, Lihua

Smart Mechatronics in Medicine

J. Geoffrey Chase, Distinguished Professor, University of Canterbury, New Zealand

Plenary Talk 2 ROOM 109-B28 Chair: Aw, Kean
09:45 – 10:30 Co-Chair: Tang, Lihua

Ionic Polymer-Metal Composites as a Candidate Underwater Active Material

Kwang J. Kim, NV Energy Professor of Energy and Matter,
Director of Active Materials and Smart Living Laboratory, Department of Mechanical Engineering, University of Nevada, USA

TuAT1	301-G050
Human Machine Interfaces 1 (Regular Session)	
Chair: Bi, Luzheng	Beijing Inst. of Tech
Co-Chair: Meng, Wei	Wuhan Univ. of Tech
11:00-11:20	TuAT1.1
Lyapunov Observer/Controller for Stable Haptic Interaction	
Jafari, Aghil (Univ. of the West of England), Singh, Harsimran (DLR German Aerospace Center), Karunanayaka, Harsha (Univ. of Bristol), Ryu, Jee-Hwan (Korea Univ. of Tech. and Education), Jun Jie, Chong (Univ. of West of the England), Etoundi, Appolinaire C. (Univ. of the West of England)	
11:20-11:40	TuAT1.2
A Single-Trial Event-Related Potential Estimation Based on Independent Component Analysis and Kalman Smoother	
Zhang, Jingwei (Beijing Inst. of Tech), Bi, Luzheng (Beijing Inst. of Tech), Lian, Jinling (Beijing Inst. of Tech), Guan, Cuntai (Inst. for Infocomm Res. A*STAR)	
11:40-12:00	TuAT1.3
Armband with Soft Robotic Actuators and Vibrotactile Stimulators for Bimodal Haptic Feedback from a Dexterous Artificial Hand	
Abd, Moaed (Florida Atlantic Univ), Bornstein, Michael (Florida Atlantic Univ), Tognoli, Emmanuelle (Florida Atlantic Univ), Engeberg, erik (Florida Atlantic Univ)	
12:00-12:20	TuAT1.4
Direction of Slip Detection for Adaptive Grasp Force Control with a Dexterous Robotic Hand	
Abd, Moaed (Florida Atlantic Univ), Gonzalez, Iker (Florida Atlantic Univ), Colestock, Thomas (Florida Atlantic Univ), Kent, Benjamin (Univ. of Akron), Engeberg, Erik (Florida Atlantic Univ)	
12:20-12:40	TuAT1.5
Knee Joint Angle Prediction Based on Muscle Synergy Theory and Generalized Regression Neural Network	
Liu, Quan (Wuhan Univ. of Tech), Ma, Liangyun (Wuhan Univ. of Tech), Ai, Qingsong (Wuhan Univ. of Tech), Chen, Kun (Wuhan Univ. of Tech), Meng, Wei (Wuhan Univ. of Tech)	

TuAT2 303-G13

Robot Dynamics and Control (Regular Session)

Chair: Morley-Drabble, Courtney — The Univ. of Queensland

Co-Chair: Hashimoto, Hideki — Chuo Univ

11:00-11:20 TuAT2.1

Study on Robust Control of Industrial Manipulator for Assembly Based on SMCSPO

Jung, Min Gyu (Pusan National Univ), Yoon, JinGon (Pusan Univ), Park, Sunoh (Pusan National Univ), Lee, Min Cheol (Pusan National Univ)

11:20-11:40 TuAT2.2

A Hybrid Control Strategy for Dual-Arm Object Manipulation Using Fused Force/Position Errors and Iterative Learning

Chen, Bo-Hsun (National Taiwan Univ), WANG, YU-HSUN (National Taiwan Univ), Lin, Pei-Chun (National Taiwan Univ)

11:40-12:00 TuAT2.3

Force Control in Time-Delay Systems Based on Equivalent Torsinal and Erastic Forces Feedback

Nagatsu, Yuki (Chuo Univ), Hashimoto, Hideki (Chuo Univ)

12:00-12:20 TuAT2.4

Precise In-Hand Motion Control of Objects Using Soft Actuators and Visual Feedback

Mori, Yoshiki (Ritsumeikan Univ), Zhu, Mingzhu (Ritsumeikan Global Innovation Res. Organization, Ritsumeikan), Kim, Hye-Jong (Ritsumeikan Univ), Wada, Akira (RITSUMEIKAN Univ), Kawamura, Sadao (Ritsumeikan Univ)

12:20-12:40 TuAT2.5

Task-Space Cooperative Tracking Control of Multi-Robot Systems with Unknown Parameters and Time Delays

Liang, Xinwu (Shanghai Jiao Tong Univ), Wang, Hesheng (Shanghai Jiao Tong Univ), Liu, Yunhui (Chinese Univ. of Hong Kong), Chen, Weidong (Shanghai Jiao Tong Univ), Xie, Le (Shanghai Jiao Tong Univ)

12:40-13:00 TuAT2.6

Snake-Like Robot with Controllable Side-Thrust Links: Dynamical Modeling and a Variable Undulation Motion

Takagi, Yuki (Osaka Univ), Sueoka, Yuichiro (Osaka Univ), Ishikawa, Masato (Osaka Univ), Osuka, Koichi (Osaka Univ)

TuAT3 303-G16

Identification and Estimation in Mechatronics 1 (Regular Session)

Chair: Seethaler, Rudolf — The Univ. of British Columbia

Co-Chair: Patton, Ron — Univ. of Hull

11:00-11:20 TuAT3.1

Enhanced Robot Calibration by Minimization of TCP Drifts During Reorientation

Niu, Bin (ABB Robotics R&D Center)

11:20-11:40 TuAT3.2

Dynamic Modelling and Load Identification of Industrial Robot Using Improved Particle Swarm Optimization

Tao, Jieyu (Huazhong Univ. of Science & Tech), Ye, Bosheng (Huazhong Univ. of Science & Tech), Xie, Yuanlong (Huazhong Univ. of Science and Tech), Tang, Xiaoqi (Huazhong Univ. of Science & Tech), Song, Bao (School of Mechanical Science & Engineering)

11:40-12:00 TuAT3.3

On-Line Parameter Estimation of an Air Handling Unit Model: Experimental Results Using the Modulating Function Method

Ionesi, Ana (Univ. of Southern Denmark), Jouffroy, Jerome (Univ. of Southern Denmark)

12:00-12:20 TuAT3.4

A Simple Asymmetric Hysteresis Model for Displacement-Force Control of Piezoelectric Actuators

Zarif Mansour, Sepehr (The Univ. of British Columbia), Seethaler, Rudolf (The Univ. of British Columbia), Fleming, Andrrew (The Univ. of Newcastle)

12:20-12:40 TuAT3.5

Identification of Viscous and Coulomb Friction in Motion Constrained Systems

Yerlikaya, Umit (FNSS Defense Systems Inc), Balkan, Tuna (Middle East Tech. Univ)

TuAT4 303-G14

Actuators 1 (Regular Session)

Chair: Lan, Chao-Chieh — National Cheng Kung Univ

Co-Chair: Takagi, Kentaro — Nagoya Univ

11:00-11:20 TuAT4.1

Similarity-Based Feedback Control for Linear Operation of Piezoelectric Actuators

Poik, Mathias (TU Wien), Kohl, Dominik (TU Wien), Schitter, Georg (TU Wien)

11:20-11:40 TuAT4.2

Magnetostrictive Actuator for Chatter Vibration Suppression of Boring Bar

Bak, Chanbeom (Ulsan National Inst. of Science and Tech), Son, Hungsun (Ulsan National Inst. of Science and Tech)

11:40-12:00 TuAT4.3

A Robotic Thruster That Can Handle Hairy Flexible Cable of Serpentine Robots for Disaster Inspection

Yamauchi, Yu (Tohoku Univ), Fujimoto, Toshiaki (Tohoku Univ), Ishii, Akihiro (Tohoku Univ), ARAKI, SHINGO (Tohoku Univ), Ambe, Yuichi (Tohoku Univ), Konyo, Masashi (Tohoku Univ), Tadakuma, Kenjiro (Tohoku Univ), Tadokoro, Satoshi (Tohoku Univ)

12:00-12:20 TuAT4.4

Equivalent Circuit and Frequency Response of the Distributed Eddy Current in an Electromagnetic Transducer

Ikegame, Toru (Nagoya Univ), Takagi, Kentaro (Nagoya Univ)

12:20-12:40 TuAT4.5

Design and Experiments of a New Type Pressure Proportional Valve

Wang, Bo (Beijing Inst. of Tech), Wang, Tao (Beijing Inst. of Tech), Chen, Jinbing (Beijing Inst. of Tech)

TuAT5 302-G20

Design and Control of Micro and Nano Precision Mechatronic Systems (Invited Session)

Chair: Ruppert, Michael G. The Univ. of Newcastle

Co-Chair: Sadeghian, Hamed TNO

Organizer: Ruppert, Michael G. The Univ. of Newcastle

Organizer: Yong, Yuen Kuan The Univ. of Newcastle

Organizer: Sadeghian, Hamed TNO

11:00-11:20 TuAT5.1

Sequential Cycloid Scanning for Time-Resolved Atomic Force Microscopy

Nikooienejad, Nastaran (The Univ. of Texas at Dallas), Alipour, Afshin (The Univ. of Texas at Dallas), Maroufi, Mohammad (The Univ. of Texas at Dallas), Moheimani, S. O. Reza (The Univ. of Texas at Dallas)

11:20-11:40 TuAT5.2

Independent Estimation of Temperature and Strain in Tee-Rosette Piezoresistive Strain Sensor

Omidbeike, Meysam (The Univ. of Newcastle), Routley, Ben Stephen (Mr), Fleming, Andrew J. (Univ. of Newcastle)

11:40-12:00 TuAT5.3

Design and Simulation of Atomic Force Profiling of High Aspect Ratio Samples Using 2D Subresonant Force Spectroscopy

Biemond, J. J. Benjamin (TNO Tech. Sciences), Herfst, Rodolf (TNO Tech. Sciences), Mashaghi, Samaneh (Netherlands Organisation for Applied Scientific Res. (TNO)), Dekker, Bert (TNO), Bijnagte, Anton Adriaan, Tom (TNO), Sadeghian, Hamed (TNO)

12:00-12:20 TuAT5.4

Design of Hybrid Piezoelectric/Piezoresistive Cantilevers for Dynamic-Mode Atomic Force Microscopy

Ruppert, Michael G. (The Univ. of Newcastle), Yong, Yuen Kuan (The Univ. of Newcastle)

12:20-12:40 TuAT5.5

A Monolithic Serial-Kinematic Nanopositioner with Integrated Sensors and Actuators

Moore, Steven (The Univ. of Newcastle), Omidbeike, Meysam (The Univ. of Newcastle), Fleming, Andrew J. (Univ. of Newcastle), Yong, Yuen Kuan (The Univ. of Newcastle)

12:40-13:00 TuAT5.6

Robustness of atomically-resolved force measurements and a virtual instrument to standardize the calibration of AFM cantilevers

Sader, John E. (The University of Melbourne)

TuAT6 301-G053

Artificial Intelligence and Machine Learning (Regular Session)

Chair: Liarokapis, Minas Univ. of Auckland

Co-Chair: Zhong, Ray Y Univ. of Auckland

11:00-11:20 TuAT6.1

Active Path Clearing Navigation through Environment Reconfiguration in Presence of Movable Obstacles

Meng, Zehui (National University of Singapore),Sun, Hao (National University of Singapore), Teo, Bo hao ken (National university of singapore),Ang Jr, Marcelo H (National University of Singapore))

11:20-11:40 TuAT6.2

Comparative Study of Data-Driven and Model-Based Real-Time Prediction During Rubber Curing Process

Frank, Tobias (Leibniz Univ. Hannover), Bosselmann, Steffen (Leibniz Univ. Hannover), Wielitzka, Mark (Leibniz Univ. Hannover), Ortmaier, Tobias (Leibniz Univ. Hanover)

11:40-12:00 TuAT6.3

A Deep Learning Tennis Ball Collection Robot and the Implementation on NVIDIA Jetson TX1 Board

Gu, Shenshen (Shanghai Univ), Chen, Xinyi (Shanghai Univ), Zeng, Wei (Shanghai Univ), Wang, Xin (Shanghai Univ)

12:00-12:20 TuAT6.4

Multiple RGB-D Camera-Based User Intent Position and Object Estimation

Kwon, Ki Hoon (Kyungpook National Univ), Oh, Hyun Min (Kyungpook National Univ), Kim, Min Young (Kyungpook National Univ)

12:20-12:40 TuAT6.5

Robot Localisation and 3D Position Estimation Using a Free-Moving Camera and Cascaded Convolutional Neural Networks

Miseikis, Justinas (Univ. of Oslo), Knöbelreiter, Patrick (Inst. of Computer Graphics and Vision, Graz Univ. of Te), Brijacak, Inka (Joanneum Res), Yahyanejad, Saeed (Joanneum Res), Glette, Kyrre (Univ. of Oslo), Elle, Ole Jakob (Oslo Univ. Hospital), Torresen, Jim (Univ. of Oslo)

12:40-13:00 TuAT6.6

Autonomous Guided Robotic Systems in Regulating Indoor Environmental Quality

Wu, Wen-Yang (National Cheng Kung Univ), Liu, Yen-Chen (National Cheng Kung Univ)

TuBT1 301-G050

Medical Robotics & Biomechatronics (Regular Session)

Chair: Maria Joseph, Felix Orlando Indian Inst. of Tech. Roorkee

Co-Chair: McDaid, Andrew Univ. of Auckland

14:00-14:20 TuBT1.1

Simulation of Muscle-Powered Jumping with Hardware-In-The-Loop Ground Interaction

Eberhard, Enrico (Royal Veterinary Coll), Richards, Christopher (The Royal Veterinary Coll)

14:20-14:40 TuBT1.2

Identification Method of Environmental Stiffness Using Haptic Forceps for Brain Surgery

Aoki, Mika (Yokohama National Univ), Shimono, Tomoyuki (Yokohama National Univ), Matsunaga, Takuya (Keio Univ), Mizoguchi, Takahiro (Kanagawa Acad. of Science and Tech), Shibao, Shunsuke (Ashikaga Red Cross Hospital), Sasaki, Hikaru (Keio Univ), Ohnishi, Kouhei (Keio Univ)

14:40-15:00 TuBT1.3

Development and Kinematic Analysis of a Redundant, Modular and Backdrivable Laparoscopic Surgery Robot

Alassi, Alaa (Bahcesehir Univ), Yilmaz, Nural (Marmara Univ), Bazman, Merve (Marmara Univ), Gur, Berke (Bahcesehir Univ), Tumerdem, Ugur (Marmara Univ)

15:00-15:20 TuBT1.4

Coordination of the Biarticular Actuators Based on Mechanical Output Power in an Explosive Jump Experiment

Nejadfard, Atabak (Univ. of Kaiserslautern), Schuetz, Steffen (Univ. of Kaiserslautern), Berns, Karsten (Univ. of Kaiserslautern), Mianowski, Krzysztof (Warsaw Univ. of Tech), Vonwirth, Patrick (Univ. of Kaiserslautern)

15:20-15:40 TuBT1.5

Design, Fabrication and Control of a Smart Flexible Needle for Minimal Invasive Surgical Procedures

Maria Joseph, Felix Orlando (Indian Inst. of Tech. Roorkee)

15:40-16:00 TuBT1.6

A Novel Remote-Center-Of-Motion Serial Manipulator for Inner Ear Drug Delivery

Abbes, Manel (Univ. of Orleans - Univ. of Sousse), Souissi, Mouna (Prisme-HEI), Belharet, Karim (Hautes Etudes D'ingénieur - HEI Campus Centre), Mekki, Hassen (Univ. of Sousse), Poisson, Gerard (Univ. D'orléans)

TuBT2 303-G13

Motion, Vibration and Noise Control (Regular Session)

Chair: Namerikawa, Toru Keio Univ

Co-Chair: Dhupia, Jaspreet Univ. of Auckland

14:00-14:20 TuBT2.1

Modal Analysis on Laboratory Scale Vibratory Bowl

Gour, Govind (Nanyang Tech. Univ), Jing, Zhang (Nanyang Tech. Univ), Tjahjowidodo, Tegoeh (Nanyang Tech. Univ), Swee Hock, Yeo (Nanyang Tech. Univ), Castagne, Sylvie (KU Leuven)

14:20-14:40 TuBT2.2

A Command Shaping Approach for Suppressing Scattered Responses on Servo Systems with Rolling Friction

Maeda, Yoshihiro (Nagoya Inst. of Tech), Iwasaki, Makoto (Nagoya Inst. of Tech)

14:40-15:00 TuBT2.3

Dynamics and Oscillation Control of Helicopters Carrying Large-Size Loads

Zhang, Yifan (Beijing Inst. of Tech), HUANG, JIE (Beijing Inst. of Tech), Katupitiya, Jayantha (The Univ. of New South Wales)

15:00-15:20 TuBT2.4

A Calculation Method for the Stability Lobes of 3-DOF Boring

Lin, Zhihang (Tsinghua Univ), Feng, Pingfa (Tsinghua Univ), Zhang, Jianfu (Tsinghua Univ), Yu, Dingwen (Tsinghua Univ), Wu, Zhijun (Tsinghua Univ)

15:20-15:40 TuBT2.5

An Adaptive Approach to Coupling Vibration Tests and Simulation Models with Harmonic Excitation

Bartl, Andreas (Tech. Univ. of Munich), Mayet, Johannes (Tech. Univ. of Munich), Rixen, Daniel (Tech. Univ. of Munich)

15:40-16:00 TuBT2.6

Merging Control for Automated Vehicles Using Decentralized Model Predictive Control

Hayashi, Yasuhiro (Keio Univ), Namerikawa, Toru (Keio Univ)

16:00-16:20 TuBT2.7

A Novel Semi-Active Tuned Mass Damper with Tunable Stiffness

Zhang, Li (Wuhan Univ. of Tech), Hong, Liu (Wuhan Univ. of Tech), Dhupia, Jaspreet (Univ. of Auckland), Johnson, Shane (Univ. of Michigan and Shanghai Jiao Tong Univ. Joint I), Qaiser, Zeeshan (Univ. of Michigan and Shanghai Jiao Tong Univ. Joint I), Zhou, Zude (Wuhan Univ. of Tech)

TuBT3 303-G16

Sensors and Sensing Systems 1 (Regular Session)

Chair: Son, Hungsun — Ulsan National Inst. of Science and Tech

Co-Chair: Shimonomura, Kazuhiro — Ritsumeikan Univ

14:00-14:20 TuBT3.1

Feature Detection and Scan Area Selection for 3D Laser Scanning Sensors

Schlarp, Johannes (Vienna Univ. of Tech), Csencsics, Ernst (Vienna Univ. of Tech), Schitter, Georg (Vienna Univ. of Tech)

14:20-14:40 TuBT3.2

A Novel Method for LiDAR Camera Calibration by Plane Fitting

Chai, Ziqi (Shanghai Jiao Tong Univ. School of Mechanical Engineering), Sun, Yuxin (Shanghai Jiao Tong Univ), Xiong, Zhenhua (Shanghai Jiao Tong Univ)

14:40-15:00 TuBT3.3

3D Reconstruction & Assessment Framework Based on Affordable 2D Lidar

Kang, Xueyang (Tech. Univ. of Munich), Yin, Shengjiong (Tongji Univ), Feng, Yinglong (Tech. Univ. of Munich)

15:00-15:20 TuBT3.4

Design, Production and Integration of a Shape Sensing Robotic Sleeve for a Hyper-Redundant, Binary Actuated Robot

Tappe, Svenja (Leibniz Univ. Hannover), Boyraz, Pinar (Istanbul Tech. Univ), Korz, Helge (Leibniz Univ. Hannover), Ortmaier, Tobias (Leibniz Univ. Hanover)

15:20-15:40 TuBT3.5

Real-Time Multicopter Detection Using Pixel-Level Digital Filters for Frame-Interpolated High-Frame-Rate Images

Shimasaki, Kohei (Hiroshima Univ), Jiang, Mingjun (Hiroshima Univ), Takaki, Takeshi (Hiroshima Univ), Ishii, Idaku (Hiroshima Univ)

15:40-16:00 TuBT3.6

Robotic Bolt Insertion and Tightening Based on In-Hand Object Localization and Force Sensing

Nozu, Kentaro (Ritsumeikan Univ), Shimonomura, Kazuhiro (Ritsumeikan Univ)

16:00-16:20 TuBT3.7

Hand-Eye Calibration of a Laser Profile Scanner in Robotic Welding

Liska, Jindrich (Univ. of West Bohemia), Vanicek, Ondrej (Univ. of West Bohemia), Chalus, Michal (Univ. of West Bohemia)

16:20-16:40 TuBT3.8

Optical localization and Open Loop Tracking of a Micro-Conveying System

Malak, Saly (Univ. De Tech. De Compiègne), Al Hajjar, Hani (Univ. De Tech. De Compiègne), Dupont, Erwan (Univ. De Tech. De Compiègne), Khan, Muneeb-Ullah (Univ. De Tech. De Compiègne), Lamarque, Frédéric (Univ. De Tech. De Compiègne)

TuBT4 303-G14

Flexible Manipulators and Structures 1 (Regular Session)

Chair: Lan, Chao-Chieh — National Cheng Kung Univ

Co-Chair: Devaraj, Harish — Univ. of Auckland

14:00-14:20 TuBT4.1

Flexible Sheet Actuator That Generates Bidirectional Traveling Waves

Watanabe, Masahiro (Tohoku Univ), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

14:20-14:40 TuBT4.2

Soft Manipulator Using Thin McKibben Actuator

Mohd Faudzi, Ahmad `Athif (Univ. Teknologi Malaysia), Azmi, Nor Iskandar (Univ. Teknologi Malaysia), Sayahkarajy, Mostafa (Univ. Teknologi Malaysia), Wong, Liang Xuan (Univ. Teknologi Malaysia), Suzumori, Koichi (Tokyo Inst. of Tech)

14:40-15:00 TuBT4.3

Rapid Finite Element Modeling Method of TBM Gripping-Thrusting-Regripping Mechanism

Wang, Fei (Tianjin Univ), Chen, Longzhen (Tianjin Univ), Wang, Kai (Tianjin Univ), Yang, Yuhu (Tianjin Univ), Liu, Xianzeng (Tianjin Univ)

15:00-15:20 TuBT4.4

FABRIKc: An Efficient Iterative Inverse Kinematics Solver for Continuum Robots

Zhang, Weihao (Shanghai Jiao Tong Univ), Yang, Zhixiong (Shanghai Jiao Tong Univ), Dong, Tianlai (Shanghai Jiao Tong Univ), Xu, Kai (Shanghai Jiao Tong Univ)

15:20-15:40 TuBT4.5

*Accurate Force Control of Flexible Manipulator Based on Mismatch of Stiffness in Load Side Observe**

Nakamura, Akiko (Yokohama National Univ), Shimono, Tomoyuki (Yokohama National Univ)

15:40-16:00 TuBT4.6

A Single-Actuator Gripper with a Working Mode Switching Mechanism for Grasping and Rolling Manipulation

Liu, Huan (Shanghai Jiao Tong Univ), Zhang, Zhaoyu (Shanghai Jiao Tong Univ), Dong, Tianlai (Shanghai Jiao Tong Univ), Zhu, Xiangyang (Shanghai Jiao Tong Univ), Xu, Kai (Shanghai Jiao Tong Univ)

TuBT5 302-G20

Power MEMS for Intelligent Internet of Things (Invited Session)

Chair: Tao, Kai Northwestern Pol. Univ

Co-Chair: Wang, Fei Southern Univ. of Science and Tech. (SUSTech)

Organizer: Tao, Kai Northwestern Pol. Univ

Organizer: Wang, Fei Southern Univ. of Science and Tech. (SUSTech)

14:00-14:20 TuBT5.1

Low Power-Cost, Self-Organized and Reconfigurable Control Strategy of Multi Sensors Inspired by Biological Mechanism for Target Detection

Shen, Qiang (Northwestern Pol. Univ), Zhou, Jie (Northwestern Pol. Univ), Xie, Jianbing (Northwestern Pol. Univ), Huang, Sunjian (Xi'an Municipal Facilities Authority), Lai, Jinpeng (Tongchuan Power Supply of SGCC), Qiu, Lei (Xi'an North Electro-Optic Science & Tech. Defense Co., Ltd)

14:20-14:40 TuBT5.2

Enhanced Performance of a Rotary Energy Harvester with Bipolar Charged Electrets

Wang, Binqiao (Northwestern Pol. Univ), Chen, Yixin (Northwestern Pol. Univ), Tao, Kai (Northwestern Pol. Univ), Wu, Jin (Sun Yat-Sen Univ), Tang, Lihua (Univ. of Auckland), Chang, Honglong (Northwestern Pol. Univ)

14:40-15:00 TuBT5.3

Two Mechanical Tuning Schemes to Improve the Bandwidth of Electret-Based Electrostatic Energy Harvester

Wang, Fei (Southern Univ. of Science and Tech. (SUSTech)), Zhang, Yulong (Southern Univ. of Science and Tech. (SUSTech)), Guo, Xinge (Southern Univ. of Science and Tech. (SUSTech)), Liu, Zong (Southern Univ. of Science and Tech. (SUSTech)), Luo, Anxin (Southern Univ. of Science and Tech. (SUSTech))

15:00-15:20 TuBT5.4

Design and Experiment of an Electromagnetic Ocean Wave Energy Harvesting Device

Guo, Qiyu (Soochow Univ), Sun, Ming (Soochow Univ), Liu, Huicong (Soochow Univ), Ma, Xin (Ocean Univ. of China), Chen, Zhaohui (Ocean Univ. of China), Chen, Tao (Soochow Univ), Sun, Lining (Harbin Inst. of Tech)

15:20-15:40 TuBT5.5

Vibrational Energy Loss Analysis of a MEMS Disk Resonator Gyroscope

Xie, Jianbing (Northwestern Pol. Univ), Yang, Jin (Northwestern Pol. Univ), Zhou, Jinqiu (Northwestern Pol. Univ)

15:40-16:00 TuBT5.6

Low-Profile Rotational Electret Energy Harvester for Battery-Less Wearable Device

Miyoshi, Tomoya (The Univ. of Tokyo), Adachi, Mitsuru (The Univ. of Tokyo), Tanaka, Yuki (The Univ. of Tokyo), Suzuki, Yuji (The Univ. of Tokyo)

16:00-16:20 TuBT5.7

Vibration-Driven Micro Energy Harvesting with Piezoelectric Materials

Kuwano, Hiroki (Tohoku Univ), Le, Van Minh (Tohoku Univ), Nguyen, Hoang Hung (Tohoku Univ), Oguchi, Hiroyuki (Tohoku Univ)

TuBT6 301-G053

Modeling, Design & Optimization in Mechatronics 1 (Regular Session)

Chair: Chase, Geoff Univ. of Canterbury

Co-Chair: Patton, Ron Univ. of Hull

14:00-14:20 TuBT6.1

Data-Driven Optimal Power Flow Management in an Electric Dual-Drive Topology for Vehicle Electrification

De Keyser, Arne (Ghent Univ), Crevecoeur, Guillaume (Ghent Univ)

14:20-14:40 TuBT6.2

Topology Optimization of Leaf Flexures for Stiffness Ratio Maximization in Compliant Mechanisms

Pinskier, Josh (Monash Univ), Shirinzadeh, Bijan (Monash Univ)

14:40-15:00 TuBT6.3

Modeling and Optimization of Non-Linear Herschel-Bulkley Fluid Model Based Magnetorheological Valve Geometry

Keshav, Manjeet (Indian Inst. of Tech. Madras), Chandra Mohan, Sujatha (Indian Inst. of Tech. Madras, Chennai)

15:00-15:20 TuBT6.4

Comparison Analysis of a Transformable Wheel

Zhou, Faliang (National Univ. of Defence Tech), Xu, Xiaojun (NUDT), Xu, Haijun (NUDT), Zhang, Xiang (NUDT)

15:20-15:40 TuBT6.5

Six DOFs Motion Platform Using Omni-Spherical Wheels

Son, Hungsun (Ulsan National Inst. of Science and Tech), Lee, seong-min (Ulsan National Inst. of Science and Tech. (UNIST))

15:40-16:00 TuBT6.6

Development of Vacuum Suction Unit Using Flame Extinguishment

Han, Ting (Zhejiang Univ), Li, Xin (Zhejiang Univ)

Posters Foyer 302-G60 & G80

16:40-17:40

Precision Analysis of an RTCM2.3-Augmented Consumer-Grade Multi-Constellation GNSS Receiver (TuP1)
Esnault, Nathanael (New Zealand), Patel, Nitish, Tunnicliffe, Jon

Machine Vision-based Intelligent Roller Surface Inspection System (TuP2)
Shi, Depeng, Zhou, Jiehan, Xu, Jirui, Yang, Jun, Li, Xuekun (China), Zhao, Zeming, Chen, Junchuang, Rong, Yiming

A Galloping Based Piezoelectric Energy Harvester (TuP3)
Wang, Junlei, Zhao, Liya (Australia), Tang, Lihua

Research on the Fault Diagnosis of Gears Based on Wavelet Transform and Envelope Spectrum Analysis (TuP4)
Liang, Pengfei, Deng, Chao (China), Wu, Jun, Duan, Chaoqun, Zhu, Jinxuan

Soft and Flexible Pressure Sensor based on Piezoresistive Pillars (TuP5)
Assadian, Mahtab (New Zealand), Devaraj, Harish, Giffney, Timothy, Yellapantula, Kartik, Aw, Kean

High Accuracy Track Tracing for Rice Drill Seeder on Uneven Paddy Fields (TuP6)
Zhang, Yan, Li, Yanming, Huang, Yixiang (China), Liu, Xiangpeng, Liu, Chengliang

Development of Shear Force Measurement and Its Feedback Mechanism by Linear Actuators (TuP7)
Miyamoto, Daichi (Japan), Igarashi, Hiroshi

Learning Based Collision Detection using EUPOC Clustering Algorithm for Safety in Rowing (TuP8)
Hallwright, Thomas (New Zealand), Guest, William

High-Speed Electromagnetic Force Compensation Precision Balance Using Magnetic Springs (TuP9)
Park, Sung-Ryong, Lee, Moon Gu, Yoon, Kyung-Taek, Lim, Hyun-Ho, Jeong, Jaehwa, Choi, Young-Man (South Korea)

Improved Weighted Projection to Latent Structures for Quality-Relevant Fault Monitoring Based on Inner Matrix Similarity (TuP10)
Bai, Xiwei, Wang, Xuelei, Tan, Jie (China), Sun, Wei, Zhang,Zhiyong, Zhang, Zhonghao

Technical Program for Wednesday July 11, 2018

Plenary Talk 3 ROOM 109-B28 Chair: Xie, Sheng Quan (Univ. of Leeds)
09:15 – 10:00

Modelling, Verification, Control and Co-Design of a Wave Energy Converter

Ron J Patton, Professor of School of Engineering and Computer Science,
Faculty of Science and Engineering, University of Hull, UK

WAT1 301-G050

Emerging Technologies in Bio-Mechatronic Rehabilitation Robotics (Invited Session)

Chair: Meng, Wei	Wuhan Univ. of Tech
Co-Chair: Chang, Jen-Yuan (James)	National Tsing Hua Univ
Organizer: Xie, Sheng Quan	Univ. of Leeds
Organizer: Chang, Jen-Yuan (James)	National Tsing Hua Univ
Organizer: Pei, Yu-Cheng	Chang Gung Memorial Hospital

Organizer: Meng, Wei — Wuhan Univ. of Tech

10:30-10:50 — WAT1.1

Design of a Lightweight Forearm Exoskeleton for Fine-Motion Rehabilitation

Su, Yin-Yu (National Cheng Kung Univ. Department of Mechanical Engineer), Wu, Kuan-Yi (National Cheng Kung Univ), Lin, Ching-Hui (National Cheng Kung Univ. Department of Mechanical Engineer), Yu, Ying-Lung (National Cheng Kung Univ. Department of Mechanical Engineer), Lan, Chao-Chieh (National Cheng Kung Univ)

10:50-11:10 — WAT1.2

A Novel Design and Fabrication of Tactile Sensor for Humanoid Robot Finger

Chou, Min-Chieh (Industrial Tech. Res. Inst), Chang, Jen-Yuan (James) (National Tsing Hua Univ), Yang, Chieh (Industrial Tech. Res. Inst), Lin, Guan-Ting (Industrial Tech. Res. Inst), Kao, Tune-Hune (Industrial Tech. Res. Inst), Huang, Meng-Chi (Industrial Tech. Res. Inst)

11:10-11:30 — WAT1.3

Walking Support Orthosis with an Lower Thigh Rotation Mechanism for Patients with Knee Osteoarthritis

Itami, Taku (Mie Univ), Yano, Ken'ichi (Mie Univ), Mori, Ichidai (Keiai Orthopedic Appliance Co., Ltd), Kameda, Kazuhiro (Keiai Orthopedic Appliance Co., Ltd), Aoki, Takaaki (Gifu Univ), Kishida, Toshitsugu (Musculoskeletal Functional Anatomy Res. Inst), Hayashi, Norio (Musculoskeletal Functional Anatomy Res. Inst), Matsui, Naruki (Meikou Brace Co., Ltd), Sugawara, Masanori (Meikou Brace Co., Ltd), Shinoda, Nobuyuki (Meikou Brace Co., Ltd)

11:30-11:50 — WAT1.4

Development of a Reconfigurable Wrist Rehabilitation Device with an Adaptive Forearm Holder

Xu, Dong (Tongji Zhejiang Coll), Zhang, Mingming (Tongji Zhejiang Coll), Sun, Ya (The Jiaxing Second Hospital Rehabilitation Medical Centre), Zhang, Xu (Tongji Zhejiang Coll), Xu, Han (Tongji Zhejiang Coll), Li, Yibin (Tongji Zhejiang Coll), Li, Xiaolong (Tongji Zhejiang Coll), Xie, Sheng Quan (Univ. of Leeds)

11:50-12:10 — WAT1.5

Hand/Finger Robotic Assistive Devices for Passive Rehabilitation

Chang, Jen-Yuan (James) (National Tsing Hua Univ), Huang, Jian-Jia (Rehabotics Medical Tech Corp.)

12:10-12:30 — WAT1.6

Context-Aware Sensing and Wearable Robots

Lo, Benny (Imperial College London)

WAT2 — 303-G13

Unmanned Aerial Vehicles (Regular Session)

Chair: Foong, Shaohui — Singapore Univ. of Tech. and Design

Co-Chair: Stol, Karl — Univ. of Auckland

10:30-10:50 — WAT2.1

Optimized Transition Path of a Transformable HOvering Rotorcraft (THOR)

Sufiyan, Danial (Singapore Univ. of Tech. & Design), Win, Luke Soe Thura (Singapore Univ. of Tech. & Design), Low, Jun En (Singapore Univ. of Tech. & Design), Kyi Hla Win, Shane (Singapore Univ. of Tech. & Design), Soh, Gim Song (Singapore Univ. of Tech. and Design), Foong, Shaohui (Singapore Univ. of Tech. and Design)

10:50-11:10 — WAT2.2

Constrained Estimation-Based Nonlinear Model Predictive Control for UAV-Elastic Tool Interaction

Koçer, Başaran Bahadır (Nanyang Tech. Univ), Tjahjowidodo, Tegoeh (Nanyang Tech. Univ), Seet, Gim Lee, Gerald (NTU)

11:10-11:30 — WAT2.3

Nonlinear Predictive UAV-Elastic Tool Interaction Control in Real-Time

Koçer, Başaran Bahadır (Nanyang Tech. Univ), Seet, Gim Lee, Gerald (NTU), Tjahjowidodo, Tegoeh (Nanyang Tech. Univ)

11:30-11:50 — WAT2.4

A Multirotor Platform Employing a Three-Axis Vertical Articulated Robotic Arm for Aerial Manipulation Tasks

Paul, Hannibal (Ritsumeikan Univ), Ono, Koji (Ritsumeikan Univ), Ladig, Robert (Ritsumeikan Univ), Shimonomura, Kazuhiro (Ritsumeikan Univ)

11:50-12:10 — WAT2.5

Automated Perching of a Multirotor UAV Atop round Timber Posts

Lin, Tzu-Jui (Univ. of Auckland), Long, Siyu (David) (Univ. of Auckland), Stol, Karl (Univ. of Auckland)

12:10-12:30 — WAT2.6

Towards a Stable Three-Mode Transformable HOvering Rotorcraft (THOR)

Low, Jun En (Singapore Univ. of Tech. & Design), Win, Luke Soe Thura (Singapore Univ. of Tech. & Design), Lee, Jiong Le (Singapore Univ. of Tech. & Design), Soh, Gim Song (Singapore Univ. of Tech. and Design), Foong, Shaohui (Singapore Univ. of Tech. and Design)

WAT3 — 303-G16

Sensing and Robotics for Coverage Optimization (Invited Session)

Chair: Chen, Xiang — Univ. of Windsor

Co-Chair: Liu, Dikai — Univ. of Tech. Sydney

Organizer: Chen, Xiang — Univ. of Windsor
Organizer: Liu, Dikai — Univ. of Tech. Sydney
Organizer: Lee, Kok-Meng — Georgia Inst. of Tech

10:30-10:50 WAT3.1

Grid Map Guided Indoor 3D Reconstruction for Mobile Robots with RGB-D Sensors

Zhang, Boyu (Nankai Univ), Zhang, Xuebo (Nankai Univ), Chen, Xiang (Univ. of Windsor), Fang, Yongchun (Nankai Univ)

10:50-11:10 WAT3.2

Modeling and Optimizing the Coverage Performance of the LiDAR Sensor Network

Farzadpour, Farsam (Univ. of Windsor), Church, Philip (Neptec Tech. Corp), Chen, Xiang (Univ. of Windsor)

11:10-11:30 WAT3.3

Machine Perception Based on Field Reconstruction for Conductivity and Hidden Geometrical Feature Characterization

Li, Min (Georgia Inst. of Tech), Lee, Kok-Meng (Georgia Inst. of Tech)

11:30-11:50 WAT3.4

Active Planning of Robot Navigation for 3D Scene Exploration

Chen, Wenzhou (Zhejiang Univ), Liu, Yong (Zhejiang Univ)

11:50-12:10 WAT3.5

High-Resolution 3D Optical Sensing and Real-Time 3D Video Data Streaming

Bell, Tyler (Purdue Univ), Zhang, Song (Purdue Univ)

12:10-12:30 WAT3.6

Performance Evaluation of an Evolutionary Multiobjective Optimization Based Area Partitioning and Allocation Approach

Hassan, Mahdi (Univ. of Tech. Sydney), Liu, Dikai (Univ. of Tech. Sydney)

WAT4 303-G14

Actuators 2 (Regular Session)

Chair: Fujii, Fumitake — Yamaguchi Univ
Co-Chair: Lamarque, Frédéric — Univ. De Tech. De Compiègne

10:30-10:50 WAT4.1

Robust Force Control of Piezoelectric Precision Positioning Actuators Using Self-Sensing Method

Fallahinia, Navid (Univ. of Utah), Zareinejad, Mohammad (Amirkabir Univ. of Tech), Talebi, Ali (Amirkabir Univ. of Tech), Ghafarirad, Hamed (Amirkabir Univ. of Tech)

10:50-11:10 WAT4.2

Two-Types Force Controllers for a Prismatic Actuation Module Redundantly Driven by Multiple Sheet-Type Dielectric Elastomer Actuators

Kubota, Hiroki (Kyushu Univ), Tahara, Kenji (Kyushu Univ)

11:10-11:30 WAT4.3

Displacement Improvement from Variable Pre-Stretch Diaphragm Type Dielectric Elastomer Actuator

Vo, Tran Vy Khanh (National Univ. of Singapore), Mathew, Anup Teejo (National Univ. of Singapore), Short, Joel Stephen (Singapore Inst. of Manufacturing Tech), Quek, Zhan Fan (Singapore Inst. of Manufacturing Tech), Koh, Soo Jin Adrian (National Univ. of Singapore)

11:30-11:50 WAT4.4

An Extension of Modified Bouc-Wen Model to Capture Frequency Dependent Hysteresis of a Bimorph Piezo Actuator Exhibiting Odd Harmonic Oscillation

Fujii, Fumitake (Yamaguchi Univ), Tatebatake, Ken'ichi (Yamaguchi Univ)

11:50-12:10 WAT4.5

Design of an Innovative Cylindrical Spring with a Negative Stiffness

Chavanne, Jonathan (Ec. Pol. Fédérale De Lausanne (EPFL)), Civet, Yoan (EPFL), Perriard, Yves (Ec. Pol. Fédérale De Lausanne (EPFL))

WAT5 302-G20

MEMS and Nano Devices (Regular Session)

Chair: Aw, Kean C. — Univ. of Auckland
Co-Chair: Sun, Dong — City Univ. of Hong Kong

10:30-10:50 WAT5.1

Modeling and Analysis of Flexure-Based Nano Positioning Devices Driven by Voice Coil Actuator

Huang, Xiaolu (Ningbo Inst. of Materials Tech. & Engineering, Chinese), Yang, Bao (Univ. of Chinese Acad. of Sciences; Ningbo Inst. of Ma), Zhang, Chi (Ningbo Inst. of Material Tech. and Engineering, CAS), Chen, Silu (Ningbo Inst. of Material Tech. and Engineering, CAS), Chen, Jinhua (Ningbo Inst. of Material Tech. and Engineering, CAS)

10:50-11:10 WAT5.2

Micro-Reactive Inkjet Printer for 2D and 3D Hydrogel Structures

Teo, Mei (Univ. of Auckland), Stuart, Logan (Univ. of Auckland), Aw, Kean C. (Univ. of Auckland), Stringer, Jonathan (Univ. of Auckland)

11:10-11:30 WAT5.3

Reduction of Residual Vibration in Displacement-Amplified Micro-Electromagnetic Actuators with Non-Linear Dynamics Using Input Shaping

Eaglin, Gerald (Univ. of Louisiana at Lafayette), Vaughan, Joshua (Univ. of Louisiana at Lafayette), Nabae, Hiroyuki (Tokyo Inst. of Tech)

11:30-11:50 WAT5.4

Design and Fabrication of Electromagnetic Induction Type MEMS Generators with Ceramic Magnetic Circuit

Kaneko, Minami (Nihon Univ), Kudo, Kazuya (Nihon Univ), Mishima, Kaito (Nihon Univ), Ebisawa, Kazuki (Nihon Univ), Saito, Ken (Coll. of Science and Tech. Nihon Univ), Uchikoba, Fumio (Nihon Univ)

11:50-12:10 WAT5.5

Error Contributions During MEMS Gyroscope Calibration by Chip-Scale Micro-Stage with Capacitive Motion Sensor

Chen, Yi (Univ. of Michigan), Aktakka, Ethem Erkan (Univ. of Michigan), Woo, Jong-Kwan (Univ. of Michigan, Ann Arbor), Najafi, Khalil (Univ. of Michigan), Oldham, Kenn (Univ. of Michigan)

WAT6 301-G053

Learning and Neural Control in Mechatronics (Regular Session)

Chair: Lee, Jangmyung Busan National Univ.

Co-Chair: Kukreja, Sunil, L. National Univ. of Singapore

10:30-10:50 WAT6.1

Data-Driven Model-Free Iterative Tuning Approach for Smooth and Accurate Tracking

Li, Xiaocong (SIMTech, A*STAR), Chen, Si-Lu (Inst. of Advanced Manufacturing Tech. Ningbo Inst), Ma, Jun (National Univ. of Singapore), Teo, Chek Sing (SIMTech), Tan, Kok Kiong (National Univ. of Singapore)

10:50-11:10 WAT6.2

Helical Contouring Control with Online Iterative Learning Control

Dao, Viet-Tu (National Chung Cheng Univ), Chen, Shyh-Leh (National Chung Cheng Univ)

11:10-11:30 WAT6.3

High Dynamic Control of a Flexure Fast Tool Servo Using On-Line Sequential Extreme Learning Machine

Wu, Zelong (Guangdong Univ. of Tech), Tang, Hui (Guangdong Univ. of Tech), Chen, Xin (Guangdong Univ. of Tech), Gao, Jian (Guangdong Univ. of Tech), He, Yunbo (Guangdong Univ. of Tech), Xu, Ying (Guangdong Univ. of Tech), chen, xun (Guangdong Univ. of Tech), To, Suet (The Hong Kong Pol. Univ), Li, Yangmin (The Hong Kong Pol. Univ), Cui, Chengqiang (Guangdong Univ. of Tech)

11:30-11:50 WAT6.4

Pump-Pressure-Compensation-Based Adaptive Neural Torque Control of a Hydraulic Excavator with Open Center Valves

Li, Yong (Zhejiang Univ), Wang, Qingfeng (Zhejiang Univ)

11:50-12:10 WAT6.5

Deep Learning Based on Smooth Driving

Kim, Kiseo (Pusan National Univ), Kim, Dongeon (Pusan National Univ), Lee, Jangmyung (Busan National Univ. Busan, Korea)

12:10-12:30 WAT6.6

Disturbance Observer-Based H∞ Control of the T-S Fuzzy Model under Imperfect Premise Matching

Hwang, Sounghwan (Yonsei Univ. Seoul), Park, Jin Bae (Yonsei Univ. Seoul), Joo, Young Hoon (Kunsan National Univ)

WBT1 301-G050

Human Machine Interfaces 2 (Regular Session)

Chair: Petrushin, Alexey Fondazione Istituto Italiano Di Tecnologia

Co-Chair: Meng, Wei Wuhan Univ. of Tech

13:30-13:50 WBT1.1

Effect of a Click-Like Feedback on Motor Imagery in EEG-BCI and Eye-Tracking Hybrid Control for Telepresence

Petrushin, Alexey (Istituto Italiano Di Tecnologia), Tessadori, Jacopo (Fondazione Istituto Italiano Di Tecnologia (IIT)), Barresi, Giacinto (Istituto Italiano Di Tecnologia), Mattos, Leonardo (Istituto Italiano Di Tecnologia)

13:50-14:10 WBT1.2

Tactical-Level Input with Multimodal Feedback for Unscheduled Takeover Situations in Human-Centered Automated Vehicles

Manawadu, Udara Eshan (Waseda Univ), Kawano, Takahiro (Waseda Univ), Hayashi, Hiroaki (Waseda Univ), Ema, Takaaki (Waseda Univ), Kamezaki, Mitsuhiro (Waseda Univ), Sugano, Shigeki (Waseda Univ)

14:10-14:30 WBT1.3

Design of a 3-D Printed 6-Dof Joystick with Force Sensing

Asad, Talha Bin (School of Mechanical Engineering, Shanghai Jiao Tong Univ), Han, Yong (Shanghai Jiao Tong Univ), Xiong, Zhenhua (Shanghai Jiao Tong Univ)

14:30-14:50 WBT1.4

Comparative Study of Soft Motion for Motion Copying System with Environmental Variations

Okano, Toshiaki (Keio Univ), Oboe, Roberto (Univ. of Padova), Ohnishi, Kouhei (Keio Univ), Murakami, Toshiyuki (Keio Univ)

14:50-15:10 WBT1.5

Analysis of Estimation Performance of Load-Side Torque and Load-Side Velocity Observers for Human Interaction Control Based on Torsion Torque Control

Kawai, Yusuke (Nagaoka Univ. of Tech), Yokokura, Yuki (Nagaoka Univ. of Tech), Ohishi, Kiyoshi (Nagaoka Univ. of Tech), Miyazaki, Toshimasa (Nagaoka Univ. of Tech)

WBT2 303-G13

Mobile Robots 1 (Regular Session)

Chair: Jiang, Zainan Harbin Inst. of Tech

Co-Chair: Shi, Yan Beihang Univ

13:30-13:50 WBT2.1

Development and Design of AIV Using Hub Motor Embedded in Mecanum Wheel

Huang, Jung-Tang (National Taipei Univ. of Tech), Hu, Jun-Yan (National Taipei Univ. of Tech), Lo, Jun-Wei (National Taipei Univ. of Tech), Cai, Qi-Dong (National Taipei Univ. of Tech)

13:50-14:10 WBT2.2

Conceptual Design of a Wheel-Track Hybrid Mobile Robot

Han, Zechao (NUDT), Xu, Haijun (NUDT), Xu, Xiaojun (NUDT), Zhang, Xiang (NUDT)

14:10-14:30 WBT2.3

Soft Simple Compact Valve Inducing Self-Excited Vibration Aimed for Mobile Robots Unnecessary for Electricity

Miyaki, Yuji (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

14:30-14:50 WBT2.4

Design of Claw-Like Hand-Foot Fusion Mechanism for the Multi-Legged Robot

Ni, Fenglei (Harbin Inst. of Tech), Zhang, Shengyu (Harbin Inst. of Tech), Jiang, Zainan (Harbin Inst. of Tech), Liu, Hong (Harbin Inst. of Tech)

14:50-15:10 WBT2.5

Contextual Online Learning Selection of Finite State Machines for Mobile Robots

Cui, Chuanzhe (Huazhong Univ. of Sci. & Tech), Zhou, Pan (Huazhong Univ. of Sci. & Tech), Gao, Liang (Huazhong Univ. of Sci. & Tech)

15:10-15:30 WBT2.6

Survey on Bioinspired Adhesive Methods and Design and Implementation of a Multi-Mode Biomimetic Wall-Climbing Robot

Xu, Jiajun (Univ. of Science and Tech. of China), Xu, Linsen (Hefei Inst. of Physical Science, CAS(Changzhou Inst. Of), Liu, Jinfu (Univ. of Science and Tech. of China), LI, Xiaohu (Hefei Inst. of Physical Science, CAS), Wu, Xuan (Hefei Inst. of Physical Science, CAS (Changzhou Inst. Of)

WBT3 303-G16

Sensors and Sensing Systems 2 (Regular Session)

Chair: Lee, Jangmyung Busan National Univ.

Co-Chair: Aoyama, Tadayoshi Nagoya Univ

13:30-13:50 WBT3.1

A Soft Time Synchronization Framework for Multi-Sensors in Autonomous Localization and Navigation

Hu, Hang (Shanghai Jiao Tong Univ), Wu, Jianhua (Shanghai Jiao Tong Univ), Xiong, Zhenhua (Shanghai Jiao Tong Univ)

13:50-14:10 WBT3.2

Position Control of a Soft Prosthetic Finger with Limited Feedback Information

Kumbay Yildiz, Solen (Hacettepe Univ), Mutlu, Rahim (Univ. of Wollongong), Alici, Gursel (Univ. of Wollongong)

14:10-14:30 WBT3.3

Fault-Tolerant Control of a Novel Powered Wheelchair Driven by Rim Motors with Hall Effect Sensors

Yang, Yee-Pien (National Taiwan Univ), Shih, Hua Yu (National Taiwan Univ)

14:30-14:50 WBT3.4

Multithread Active Vision-Based Modal Analysis Using Multiple Vibration Distribution Synthesis Method

Aoyama, Tadayoshi (Nagoya Univ), Li, Liang (Hiroshima Univ), Jiang, Mingjun (Hiroshima Univ), Takaki, Takeshi (Hiroshima Univ), Ishii, Idaku (Hiroshima Univ), Yang, Hua (Huazhong Univ. of Science and Tech), Umemoto, Chikako (Keisoku Res. Consultant Co),

Matsuda, Hiroshi (Nagasaki Univ), Chikaraishi, Makoto (Hiroshima Univ), Fujiwara, Akimasa (Hiroshima Univ)

14:50-15:10 WBT3.5

Experimental Evaluation of Piezoelectric Self-Sensing During Terrestrial Locomotion of a Miniature Legged Robot

Zhang, Buyi (Univ. of Michigan, Ann Arbor), Qu, Jinhong (Univ. of Michigan), Oldham, Kenn (Univ. of Michigan)

15:10-15:30 WBT3.6

Development of a Wind Tunnel Experimental Setup for Testing Multirotor Unmanned Aerial Vehicles in Turbulent Conditions

Bannwarth, Jérémie Xavier Joseph (Univ. of Auckland), Chen, Zhenrong Jeremy (Univ. of Auckland), Stol, Karl (Univ. of Auckland), MacDonald, Bruce (Univ. of Auckland), Richards, Peter John (Univ. of Auckland)

WBT4 303-G14

Flexible Manipulators and Structures 2 (Regular Session)

Chair: Lan, Chao-Chieh National Cheng Kung Univ

Co-Chair: Devaraj, Harish Univ. of Auckland

13:30-13:50 WBT4.1

An Adaptive-Compliance Manipulator for Contact-Based Aerial Applications

Hamaza, Salua (Bristol Robotics Lab. Univ. of Bristol; Univ. O), Georgilas, Ioannis (Univ. of Bath), Richardson, Thomas (Univ. of Bristol)

13:50-14:10 WBT4.2

A Soft Robotic Gripper Module with 3D Printed Compliant Fingers for Grasping Fruits

Liu, Chih-Hsing (National Cheng Kung Univ), Chiu, Chen-Hua (National Cheng Kung Univ), Chen, Ta-Lun (National Cheng Kung Univ), Pai, Tzu-Yang (National Cheng Kung Univ), Chen, Yang (NCKU), Hsu, Mao-Cheng (NCKU)

14:10-14:30 WBT4.3

Towards Accurate Shape Reconstruction of Compact Bionic Handling Arm

Singh, Inderjeet (CRIStAL, CNRS UMR 9189, Univ. of Lille1), Amara, Yacine (Ec. Militaire Pol), Singh, Manarshhjot (Pol. Lille), Merzouki, Rochdi (CRIStAL, CNRS UMR 9189, Univ. of Lille1)

14:30-14:50 WBT4.4

Continuum Delta Robot: A Novel Translational Parallel Robot with Continuum Joints

Yang, Zhixiong (Shanghai Jiao Tong Univ), Zhu, Xiangyang (Shanghai Jiao Tong Univ), Xu, Kai (Shanghai Jiao Tong Univ)

14:50-15:10 WBT4.5

Experimental Verification of a Completely Soft Gripper for Grasping and Classifying Beam Members in Truss Structures

Bykerk, Lili (Univ. of Tech. Sydney), Liu, Dikai (Univ. of Tech. Sydney)

15:10-15:30 WBT4.6

Design and Analysis of a Large-Range Flexure-Based Parallel Mechanism Based on Matrix Method

Yu, Hongtao (Univ. of Chinese Acad. of Sciences， Ningbo Inst), Zhang, Chi (Ningbo Inst. of Material Tech. and Engineering, CAS), Yang, Bao (Univ. of Chinese Acad. of Sciences; Ningbo Inst. of Ma), Chen, Silu (Ningbo Inst. of Material Tech. and Engineering, CAS), Yang, Guilin (Ningbo Inst. of Material Tech. and Engineering, CAS)

WBT5 302-G20

Energy Harvesting for Self-Powered Health Monitoring (Invited Session)

Chair: Cao, Junyi Xi'an Jiao Tong Univ

Co-Chair: Zhao, Liya Univ. of Tech. Sydney

Organizer: Cao, Junyi Xi'an Jiao Tong Univ

Organizer: Zhao, Liya Univ. of Tech. Sydney

Organizer: Liang, Junrui ShanghaiTech Univ

13:30-13:50 WBT5.1

Capturing Energy through a Shoe-Mounted Piezoelectric Energy Harvester

Fan, Kangqi (Xidian Univ), Liu, Zhaohui (Xidian Univ)

13:50-14:10 WBT5.2

Piezoelectric Spring Pendulum Oscillator for Animal/Human Motion Energy Harvesting

Wu, Yipeng (Nanjing Univ. of Aeronautics and Astronautics), Qiu, Jinhao (Nanjing Univ. of Aeronautics and Astronautics), Ji, Hongli (Nanjing Univ. of Aeronautics and Astronautics), Zhou, Shengpeng (Nanjing Univ. of Aeronautics and Astronautics)

14:10-14:30 WBT5.3

Performance Enhancement of an Aeroelastic Energy Harvester for Efficient Power Harvesting from Concurrent Wind Flows and Base Vibrations

Zhao, Liya (Univ. of Tech. Sydney)

14:30-14:50 WBT5.4

Development of Self-Powered Smart Bearing for Health Condition Monitoring

Cao, Junyi (Xi'an Jiao Tong Univ)

14:50-15:10 WBT5.5

Design of a Novel Piezoelectric Energy Harvester for Scavenging Energy from Human Walking

Wen, Shihao (Univ. of Macau), Xu, Qingsong (Univ. of Macau)

15:10-15:30 WBT5.6

Energy Harvesting from Horizontal and Vertical Backpack Movements During Walking

Wang, Junlong (ShanghaiTech Univ), Liang, Junrui (ShanghaiTech Univ)

WBT6 301-G053

Manufacturing (Regular Session)

Chair: Lin, Ming-Tsung National Formosa Univ

Co-Chair: Zhong, Ray Y Univ. of Auckland

13:30-13:50 WBT6.1

Optimization of Process Parameters for Rubber Curing in Relation to Vulcanization Requirements and Energy Consumption

Bosselmann, Steffen (Leibniz Univ. Hannover), Frank, Tobias (Leibniz Univ. Hannover), Wielitzka, Mark (Leibniz Univ. Hannover), Ortmaier, Tobias (Leibniz Univ. Hanover)

13:50-14:10 WBT6.2

A Force Control Method with Positive Feedback for Industrial Finishing Applications

Ma, Zheng (National Univ. of Singapore), Ang Jr, Marcelo H (National Univ. of Singapore), Hong, Geok Soon (National Univ. of Singapore), Poo, Jim A.N. (National Univ. of Singapore), Lin, Wei (SIMTech, A*STAR)

14:10-14:30 WBT6.3

Local Corner Smoothing with Kinematic and Real-Time Constraints for Five-Axis Linear Toolpath

Lin, Ming-Tsung (National Formosa Univ), Lee, Jih-Chieh (National Formosa Univ), Shen, Chien-Chun (National Formosa Univ), Lee, Chien-Yi (Industrial Tech. Res. Inst), Wang, Jo-Ting (National Formosa Univ)

14:30-14:50 WBT6.4

Automatic Logistics in a Smart Factory Using RFID-Enabled AGVs

Oliver, Zou (Univ. of Auckland), Zhong, Ray Y (Univ. of Auckland)

14:50-15:10 WBT6.5

Towards Printing Mechatronics: Considerations for 3D-Printed Conductive Coupling

Popa, Andrei-Alexandru (Univ. of Southern Denmark), Mai, Christian (Univ. of Southern Denmark), Duggen, Lars (Univ. of Southern Denmark), Jouffroy, Jerome (Univ. of Southern Denmark)

15:10-15:30 WBT6.6

Soil Transport Experiment by Peristaltic Transport Machine for Compact Automatic Transportation System of Excavated Soil

Ashigaki, Kyota (Chuo Univ), Hagiwara, Daiki (Chuo Univ), Negishi, Kai (Chuo Univ), Yoshihama, Shun (Chuo Univ), Ueda, Masahiro (TAKENAKA Corp), Habu, Hiroto (JAXA), Nakamura, Taro (Chuo Univ)

WCT1 301-G050

Rehabilitation Robots 1 (Regular Session)

Chair: Maria Joseph, Felix Orlando Indian Inst. of Tech. Roorkee

Co-Chair: Zhang, Yanxin Univ. of Auckland

16:00-16:20 WCT1.1

A Bilateral Training System for Upper-Limb Rehabilitation: A Follow-Up Study

Sheng, Bo (Univ. of Auckland), Zhang, Yanxin (Univ. of Auckland), Tang, Lihua (Univ. of Auckland), Xie, Sheng Quan (Univ. of Leeds), Deng, Chao (Huazhong Univ. of Science & Tech)

16:20-16:40 WCT1.2

A Human-Centered Control Framework for Robotic Sit-To-Stand Assistance

Li, Jiawei (New Jersey Inst. of Tech), Lu, Lu (New Jersey Inst. of Tech), Zhao, Leidi (New Jersey Inst. of Tech), Wang, Cong (New Jersey Inst. of Tech), Huo, Xiaoye (New Jersey Inst. of Tech)

16:40-17:00 WCT1.3

The Applicability of an Assistive Walking Device Integrating Overload Protection Mechanism Using a Torque Limiter

Zhuang, Jyun Rong (Waseda Univ), Nagayoshi, Hayato (Waseda Univ), Kondo, Hirotoshi (Kondo Kagaku, Co., Ltd), Lee, Hee-hyol (Waseda Univ), Tanaka, Eiichiro (Waseda Univ)

17:00-17:20 WCT1.4

A Hybrid Multi-Joint Robotic Shoulder Exoskeleton for Stroke Rehabilitation

Niyetkaliyev, Aibek (Univ. of Wollongong), SARIYILDIZ, Emre (Univ. of Wollongong), Alici, Gursel (Univ. of Wollongong)

17:20-17:40 WCT1.5

Redundancy Resolution of an Index Finger Exoskeleton Using Self Organizing Map

Maria Joseph, Felix Orlando (Indian Inst. of Tech. Roorkee)

17:40-18:00 WCT1.6

An Exoskeleton Type 4-DOF Force Feedback Device Using Magnetorheological Fluid Clutches and Artificial Muscles

Onozuka, Yuki (Chuo Univ), Suzuki, Ryo (Chuo Univ), Yamada, Yasuyuki (Chuo Univ), Nakamura, Taro (Chuo Univ)

WCT2 303-G13

Underwater Robotics (Regular Session)

Chair: Kim, Kwang Univ. of Nevada, Las Vegas (UNLV)

Co-Chair: Liu, Bo Inst. of Systems Engineering, China Acad. of Engineering Physics

16:00-16:20 WCT2.1

Whale Rover for Bio-Logging

Tsuchiya, Kosuke (Yamagata Univ), Suzuki, Akihito (Yamagata Univ), Tsumaki, Yuichi (Yamagata Univ), Mori, Kyoichi (Teikyo Univ. of Science)

16:20-16:40 WCT2.2

Ground Effect on the Hydrodynamic Performance of a Flexible Hinge-Connected Fin

Liu, Bo (Inst. of Systems Engineering, China Acad. of Engineering P), Guo, Zhongze (Inst. of Systems Engineering, China Acad. of Engineering P)

16:40-17:00 WCT2.3

Water Jetting Excavation and Consideration of Earth Auger Shape to Reduce Drilling Torque for Seabed Robotic Explorer

Isaka, Keita (Chuo Univ), Tadami, Naoaki (Chuo Univ), Fujiwara, Ami (Chuo Univ), Nakatake, Toyoharu (Chuo Univ), Yamada, Yasuyuki (Chuo Univ), Nakamura, Taro (Chuo Univ), Sugesawa, Makoto (Japan Agency for Marine-Earth Science and Tech), Yoshida, Hiroshi (Japan Agency for Marine-Earth Science and Tech)

17:00-17:20 WCT2.4

Design and Experimental Study on a Shallow Water Underwater Glider

Liu, Yanji (Univ. of Shanghai Jiao Tong), Ma, Jie (Univ. of Shanghai Jiao Tong), Liu, Yanbo (Shanghai Industrial Tech. Inst), Zhang, Guichen (Shanghai Maritime Univ), Tan, Xiaoling (Shanghai GrandTop Electric Tech. CO., Ltd)

17:20-17:40 WCT2.5

Model Comparison of a VideoRay Pro 4 Underwater ROV

Pedersen, Simon (Aalborg Univ), Enevoldsen, Thomas Thuesen (Aalborg Univ. Esbjerg), Einarsson, Emil Már (Aalborg Univ)

WCT3 303-G16

Path Planning, Navigation and Space Exploration (Regular Session)

Chair: Zhong, Ray Y Univ. of Auckland

Co-Chair: Nakamura, Taro Chuo Univ

16:00-16:20 WCT3.1

Re-Planning Using Delaunay Triangulation for Real Time Motion Planning in Complex Dynamic Environments

Qureshi, Ahmed (Univ. of California, San Diego), Tahir, Zaid (National Univ. of Science and Tech), Tariq, Guliafshan (National Univ. of Science and Tech), Ayaz, Yasar (National Univ. of Sciences and Tech. (NUST))

16:20-16:40 WCT3.2

Modeling and Simulation of FLC-Based Navigation Algorithm for Small Gas Pipeline Inspection Robot

Zhao, Wen (Waseda Univ), Kamezaki, Mitsuhiro (Waseda Univ), Yoshida, Kento (Waseda Univ), Konno, Minoru (Tokyo Gas Co. Ltd), Onuki, Akihiko (Tokyogas), Sugano, Shigeki (Waseda Univ)

16:40-17:00 WCT3.3

Undelayed Initialization of Inverse Depth Parameterized Landmarks in UKF-SLAM with Error State Formulation

Ammann, Nikolaus (German Aerospace Center (DLR))

17:00-17:20 WCT3.4

Development of Both-Ends Supported Flexible Auger for Lunar Earthworm-Type Excavation Robot LEAVO

Fujiwara, Ami (Chuo Univ), Nakatake, Toyoharu (Chuo Univ), Tadami, Naoaki (Chuo Univ), Isaka, Keita (Chuo Univ), Yamada, Yasuyuki (Chuo Univ), Nakamura, Taro (Chuo Univ), SAWADA, HIROTAKA (JAXA), Kubota, Takashi (Jaxa Isas)

17:20-17:40 WCT3.5

Study on Bearing Performance for Inching Worm Locomotion Using Characteristics of Wheel Subsidence on Loose Soil

Fujiwara, Daisuke (Shibaura Inst. of Tech), Iizuka, Kojiro (Shibaura Inst. of Tech)

WCT4 303-G14

Pneumatic Actuated Systems (Regular Session)

Chair: Alici, Gursel Univ. of Wollongong

Co-Chair: Kogiso, Kiminao The Univ. of Electro-Communications

16:00-16:20 WCT4.1

Development of Contraction Force Control System of Peristaltic Crawling Robot for Sewer Pipe Inspection

Mano, Yuki (Chuo-Univ), Ishikawa, Ryutaro (Chuo-Univ), Yamada, Yasuyuki (Chuo Univ), Nakamura, Taro (Chuo Univ)

16:20-16:40 WCT4.2

One Soft Robot: A Complementary Design & Control Strategy for a Pneumatically Powered Soft Robot

Morley-Drabble, Courtney (The Univ. of Queensland), Singh, Surya (The Univ. of Queensland)

16:40-17:00 WCT4.3

3D Printed Helical Soft Pneumatic Actuators

Hu, Weiping (Univ. of Wollongong), Li, Weihua (Univ. of Wollongong), Alici, Gursel (Univ. of Wollongong)

17:00-17:20 WCT4.4

Soft Pneumatic Manipulator Capable of Sliding under the Human Body and Its Application to Preventing Bedsores

Nakamura, Tomoyuki (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

17:20-17:40 WCT4.5

Efficient Algorithm for Constructing a Load-Dependent McKibben Pneumatic Artificial Muscle Model

Okabe, Atsushi (The Univ. of Electro-Communications), Kogiso, Kiminao (The Univ. of Electro-Communications)

17:40-18:00 WCT4.6

Development of a Pneumatic Robotic System for Bilateral Upper Limb Interactive Training with Variable Resistance

Xu, Han (Tongji Zhejiang Coll), Zhang, Mingming (Tongji Zhejiang Coll), Li, Yibin (Tongji Zhejiang Coll), Xu, Dong (Tongji Zhejiang Coll), Fu, Jianming (The Jiaxing Second Hospital Rehabilitation Medical Centre), Zhang, Xu (Tongji Zhejiang Coll), Li, Xiaolong (Tongji Zhejiang Coll), Xie, Sheng Quan (Univ. of Leeds)

WCT5 302-G20

Micro/Nano Manipulation (Regular Session)

Chair: Avci, Ebubekir Massey Univ

Co-Chair: Xu, Qingsong Univ. of Macau

16:00-16:20 WCT5.1

An Auto-Focusing Approach for Micro Objects at Different Focal Planes

Lofroth, Matthew (Massey Univ), Avci, Ebubekir (Massey Univ)

16:20-16:40 WCT5.2

Finite Element Analysis of a New Multi-DOF Flexible Micro-Displacement Manipulator Based on Ferrofluid

Li, Chunfang (Beihang Univ), Wu, Shuai (Beihang Univ), Yu, Bo (Beihang Univ), Jiao, Zongxia (Beihang Univ)

16:40-17:00 WCT5.3

Development of a Micromanipulation Platform with Passive-Active Hybrid Release Strategy for Single-Cell Separation

Crimp, Daniel Patrick (Massey Univ), Avci, Ebubekir (Massey Univ)

17:00-17:20 WCT5.4

Design and Analysis of a Novel 3-DOF Large Range Micropositioning Mechanism

Al-Jodah, Ammar (Monash Univ. Melbourne, Australia), Shirinzadeh, Bijan (Monash Univ), Ghafarian, Mohammadali (Monash), Tian, Yanling (Tianjin Univ), Clark, Leon Scott (Monash Univ)

17:20-17:40 WCT5.5

Design of a Novel Parallel Monolithic 6-DOF Compliant Micromanipulation Mechanism

Ghafarian, Mohammadali (Monash Univ), Shirinzadeh, Bijan (Monash Univ), Das, Tilok Kumar (Monash Univ), Al-Jodah, Ammar (Monash Univ), Wei, Weichen (Monash Univ)

WCT6 301-G053

Modeling, Design & Optimization in Mechatronics 2 (Regular Session)

Chair: Ji, Jingjing Huazhong Univ. of Science and Tech

Co-Chair: Kukreja, Sunil, L. National Univ. of Singapore

16:00-16:20 WCT6.1

Optimal Design of an Elastomeric Engine Mount with Desired Stiffness Using Topology Optimization

Liu, Chih-Hsing (National Cheng Kung Univ), Chiang, Yen-Pin (National Cheng Kung Univ), Hsu, Yi-Yao (National Cheng Kung Univ)

16:20-16:40 WCT6.2

Outer-Linearization-Based Optimization Algorithm for Decentralized Control Design in Flexure-Linked H-Gantry

Ma, Jun (National Univ. of Singapore), Chen, Si-Lu (Inst. of Advanced Manufacturing Tech. Ningb), Liang, Wenyu (National Univ. of Singapore), Li, Xiaocong (SIMTech), Teo, Chek Sing (SIMTech), Tay, Arthur (National Univ. of Singapore), Mamun, Abdullah Al (National Univ. of Singapore), Tan, Kok Kiong (National Univ. of Singapore)

16:40-17:00 WCT6.3

A Low-Cost Hardware-In-The-Loop Agent-Based Simulation Testbed for Autonomous Vehicles

Barker, Ray (The Univ. of Western Australia), Hurst, Aaron (The Univ. of Western Australia), Shrubsall, Ridge (The Univ. of

Western Australia), Hassan, Ghulam Mubashar (The Univ. of Western Australia), French, Tim (The Univ. of Western Australia)

17:00-17:20 WCT6.4

Actuator-Based Optimization Motion Cueing Algorithm

Ellensohn, Felix (Tech. Univ. of Munich), Oberleitner, Florian (Tech. Univ. Munich), Schwienbacher, Markus (Bmw Ag), Venrooij, Joost (Bmw Ag), Rixen, Daniel (Tech. Univ. München)

17:20-17:40 WCT6.5

An Intelligent Gripper Design for Autonomous Aerial Transport with Passive Magnetic Grasping and Dual-Impulsive Release

Fiaz, Usman Amin (Univ. of Maryland, Coll. Park), Abdelkader, Mohamed (King Abdullah Univ. of Science and Tech), Shamma, Jeff (King Abdullah Univ. of Science and Tech)

17:40-18:00 WCT6.6

Reliability Analysis of a Novel Magneto-Rheological Regenerative Suspension System under Road Excitation

Zhang, Hailong (Nanjing Normal Univ), Zhang, Tinghui (Nanjing Normal Univ), Shen, Shuyu (Nanjing Normal Univ), wang, enrong (Nanjing Normal Univ), Subhash, Rakheja (Concordia Univ), Su, Chunyi (Concordia Univ)

Technical Program for Thursday July 12, 2018

Plenary Talk 4 ROOM 109-B28 Chair: Xie, Sheng Quan (Univ. of Leeds)
09:15 – 10:00

CloudRobotics: The Cloud-Side Story -- Low-Latency and Reliable Cloud Computing forRobotics

Jie Xu, Professor of School of Computing, University of Leeds, UK

ThAT1 301-G050

Physical Human-Robot Interactions and Human Assistive Systems (Invited Session)

Chair: Ueda, Jun Georgia Inst. of Tech
Co-Chair: Yi, Jingang Rutgers Univ
Organizer: Ueda, Jun Georgia Inst. of Tech
Organizer: Lee, Kok-Meng Georgia Inst. of Tech
Organizer: Yi, Jingang Rutgers Univ

10:30-10:50 ThAT1.1

A Real-Time Pre-Impact Fall Detection and Protection System

Zhong, Zhichao (Zhejiang Univ), Chen, Feiyu (Zhejiang Univ), Zhai, Qian (Zhejiang Univ), Fu, Zhiqiang (Zhejiang Univ), Ferreira, João (ISEC), Liu, Yanjie (Harbin Inst. of Tech), Yi, Jingang (Rutgers Univ), Liu, Tao (Zhejiang Univ)

10:50-11:10 ThAT1.2

Biomechanical Energy Harvester with Continuously Variable Transmission: Prototyping and Preliminary Evaluation

Ikawa, Yutaro (Nara Inst. of Science and Tech), Kobayashi, Taisuke (Nara Inst. of Science and Tech), Matsubara, Takamitsu (Nara Inst. of Science and Tech)

11:10-11:30 ThAT1.3

Strength Capacity Estimation of Human Upper Limb in Human-Robot Interactions with Muscle Synergy Models

Chen, Siyu (Rutgers Univ), Yi, Jingang (Rutgers Univ), Liu, Tao (Zhejiang Univ)

11:30-11:50 ThAT1.4

Design Criteria for Developing an Anatomy-Based Ankle-Foot-Orthosis: A State-Of-The-Art Review and Needs of Mind, Motor and Motion Recovery Following Stroke

Jiang, Jiaoying (Huazhong Univ. of Science and Tech), Lee, Kok-Meng (Georgia Inst. of Tech), Ji, Jingjing (Huazhong Univ. of Science and Tech)

11:50-12:10 ThAT1.5

Coordination of Whole Body Muscles During Assisted Assembly Tasks

Qiu, Yingxin (Georgia Inst. of Tech), Okabe, Atsushi (The Univ. of Electro-Communications), Murali, Keerthana (Georgia Inst. of Tech), Gao, Dalong (General Motors), Ueda, Jun (Georgia Inst. of Tech)

12:10-12:30 ThAT1.6

Distributed Parameter Element Method for Design Analysis of Electrical Muscle Stimulation

Lin, Chun-Yeon (Georgia Inst. of Tech), Lee, Kok-Meng (Georgia Inst. of Tech), Li, Junwei (Huazhong Univ. of Science and Tech), Bai, Kun (Huazhong Univ. of Science and Tech)

ThAT2 303-G13

Mobile Robots 2 (Regular Session)

Chair: Iversen, Simon Univ. of Southern Denmark
Co-Chair: Funabora, Yuki Nagoya Univ

10:30-10:50 ThAT2.1

Long-Mover: Flexible Tube In-Pipe Inspection Robot for Long Distance and Complex Piping

Miyasaka, Kentaro (Tokyo Inst. of Tech), Kawano, Ginjiro (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

10:50-11:10 ThAT2.2

Autonomous Navigation of Electric Wheelchairs in Urban Areas on the Basis of Self-Generated 2D Drivable Maps

Niijima, Shun (Tokyo Univ. of Science, National Inst. of Advanced Indu), Sasaki, Yoko (National Inst. of Advanced Industrial Science and Tech), Mizoguchi, Hiroshi (Tokyo Univ. of Science)

11:10-11:30 ThAT2.3

An Inchworm-Inspired Rigid-Reinforced Soft Robot with Combined Functions of Locomotion and Manipulation

Wang, Tao (Xi'an Jiaotong Univ), zhang, jinhua (Xi'an Jiaotong Univ), Gen, Zhao (Xi'an Jiaotong Univ), Hong, Jun (Xi'an Jiaotong Univ), Wang, Michael Yu (Hong Kong Univ. of Science & Tech), Yue, Li (Xi'an Jiaotong Univ)

11:30-11:50 ThAT2.4

A Mechanical Design for Efficient Hopping of Planetary Rover on Soft Soil

Sakamoto, Kosuke (The Univ. of Tokyo), Kubota, Takashi (Jaxa Isas), Otsuki, Masatsugu (Japan Aerospace Exploration Agency), Maeda, Takao (Chuo Univ), Yoshikawa, Kent (JAXA)

11:50-12:10 ThAT2.5

Step-Height Detection for the Umbrella Wheel Stair-Climber Using Model Prediction

Iversen, Simon (Univ. of Southern Denmark), Jouffroy, Jerome (Univ. of Southern Denmark)

12:10-12:30 ThAT2.6

Majority Rule Sensor Fusion System with Particle Filter for Robust Robot Localization

Ohashi, Nozomu (Nagoya Univ), Funabora, Yuki (Nagoya Univ), Doki, Shinji (Nagoya Univ), Doki, Kae (Aichi Inst. of Tech)

ThAT3 303-G16

Fault Detection and Diagnosis (Regular Session)

Chair: Dhupia, Jaspreet Univ. of Auckland

Co-Chair: Zhang, Jianfu Tsinghua Univ

10:30-10:50 ThAT3.1

Study on Health Assessment and Residual Useful Life Prediction of Wind Turbine

Deng, Chao (Huazhong Univ. of Science & Tech), Technology, Huazhong University of Science (Huazhong Univ. of Science and Tech), Liang, Pengfei (Huazhong Univ. of Science and Tech. School of Mechanic), WU, JUN (Huazhong Univ. of Science and Tech)

10:50-11:10 ThAT3.2

Modeling Method for Bolted Joint Interfaces Based on Transversely Isotropic Virtual Materials

Zha, Yunjian (Tsinghua Univ), Zhang, Jianfu (Tsinghua Univ), Yu, Dingwen (Tsinghua Univ), Feng, Pingfa (Tsinghua Univ), Lin, zhihang (Tsinghua Univ)

11:10-11:30 ThAT3.3

A Critical Investigation of Hilbert-Huang Transform Based Envelope Analysis for Fault Diagnosis of Gears

Dev Choudhury, Madhurjya (Univ. of Auckland), Hong, Liu (Wuhan Univ. of Tech), Dhupia, Jaspreet (Univ. of Auckland)

11:30-11:50 ThAT3.4

"Dynamic Closest Point" Identification and Estimation for Tumbling Target Capturing

Hu, Zhonghua (Harbin Inst. of Tech. Shenzhen Graduate School), Xu, Wenfu (Harbin Inst. of Tech), Yan, Lei (Harbin Inst. of Tech. Shenzhen Graduate School), Peng, Jianqing (Harbin Inst. of Tech. Shenzhen Graduate School), Liang, Bin (Harbin Inst. of Tech)

ThAT4 303-G14

Actuators 3 (Regular Session)

Chair: Makarow, Artemi TU Dortmund Univ

Co-Chair: Xie, Sheng Quan Univ. of Leeds

10:30-10:50 ThAT4.1

Preliminary Design of a Pseudo-Inertia Adjustable Mechanism Based on Bidirectional Releasing of Stored Kinetic Energy

Zhang, Peizhi (Waseda Univ), Kamezaki, Mitsuhiro (Waseda Univ), Otsuki, Kenshiro (Waseda Univ), He, Shan (Waseda Univ), Aguirre Dominguez, Gonzalo (Waseda Univ. Sugano Lab), Sugano, Shigeki (Waseda Univ)

10:50-11:10 ThAT4.2

A Piezoelectric Two-Degree-Of-Freedom Nanostepping Motor with a Positioning Sensor

Cheng, Chiao-Hua (National Chiao Tung Univ), Hung, Shao-Kang (National Chiao Tung Univ)

11:10-11:30 ThAT4.3

Optimization of an Optically Controlled Bistable Micro-Actuator

Shi, Zhichao (Univ. De Tech. De Compiègne), Al Hajjar, Hani (Univ. De Tech. De Compiègne), Prelle, Christine (Univ. De Tech. De Compiègne), Liu, Xingxing (China Agricultural Univ), Ilou, Lucie (Univ. De Tech. De Compiègne), Lamarque, Frédéric (Univ. De

Tech. De Compiègne)

11:30-11:50 ThAT4.4

Design and of Control System of Simulating on Rotational Speed and Torque of Central Transmission System Test Rig for Earth-Moving Vehicl

Ma, Yuxiang (Beihang Univ), Li, Yunhua (BeiHang Univ)

11:50-12:10 ThAT4.5

A Multi-Information Particle Swarm Optimization Algorithm for Weapon Target Assignment of Multiple Kill Vehicle

Yang, Liman (Beihang Univ), Zhai, Zhuangzhuang (Beihang Univ), Li, Yunhua (Beihang Univ), Huang, Yuntao (Beijing Aerospace Automatic Control Inst)

ThAT5 302-G20

Control, Simulation and Condition Monitoring for Electromechanical Systems (Invited Session)

Chair: Li, Yunhua BeiHang Univ

Co-Chair: Shi, Yan Beihang Univ

Organizer: Li, Yunhua BeiHang Univ

Organizer: Li, Yun-Ze Beihang Univ

Organizer: Yang, Liman BeiHang Univ

10:30-10:50 ThAT5.1

The Identification of Sputum Situation Based on the Sound from the Respiratory Tract

Niu, Jinglong (School of Automation Science and Electrical Engineering, Beihang), Shi, Yan (Beihang Univ), Shen, Dongkai (Beihang Unviersity), Wang, Yixuan (Beihang Univ), Xu, Weiqing (Beihang Univ), Cai, Maolin (Beihang Univ), Li, Yunhua (BeiHang Univ)

10:50-11:10 ThAT5.2

Study on PMSM Power Consumption of Dual-Variable Electro-Hydraulic Actuator Controlled by Displacement-Pressure Regulation Pump

Li, Dong (Beihang Univ), Li, yangyang (School of Automation Science and Electrical Engineering), Li, Yunhua (BeiHang Univ), Yang, Liman (BeiHang Univ), Zhang, Peng (Beihang Univ. of Automation Science and Electrical E), Dong, Sujun (Beihang Univ)

11:10-11:30 ThAT5.3

Design and Verification of Model-Based Nonlinear Controller for Fluidic Soft Actuators

Wang, Tao (Zhejiang Univ), Zhang, Yunce (Zhejiang Univ), Chen, Zheng (Zhejiang Univ)

11:30-11:50 ThAT5.4

Analysis of Power Loss of Permanent Magnet Synchronous Motors in More-Electric-Aircraft Considering the Impact of Temperature

Wang, Shengnan (Beihang Univ), Li, Yunhua (BeiHang Univ), Li, Yun-Ze (Beihang Univ), Xiong, Kai (Beihang Univ)

11:50-12:10 ThAT5.5

Effective Control for Wireless Sensor and Mobile Actuator Network in Regulation of Environmental Density Function

Lin, Mu-Tai (National Cheng Kung Univ), Liu, Yen-Chen (National Cheng Kung Univ)

ThAT6 301-G053

Image Processing and Machine Vision (Regular Session)

Chair: Ryde, Julian United Tech. Res. Center

Co-Chair: Witkowski, Ulf South Westphalia Univ. of Applied Sciences

10:30-10:50 ThAT6.1

Robustness Improvement of Long Range Landmark Tracking for Mobile Robots

Kovács, Gábor (Chuo Univ), Hoshi, Naoaki (Chuo Univ), Kunii, Yasuharu (Chuo Univ)

10:50-11:10 ThAT6.2

Nonlinear Distortion Calibration of an Optical Flow Sensor for Monocular Visual Odometry

Ng, Matthew (Singapore Univ. of Tech. and Design), Foong, Shaohui (Singapore Univ. of Tech. and Design)

11:10-11:30 ThAT6.3

RenderMap: Exploiting the Link between Perception and Rendering for Dense Mapping

Ryde, Julian (United Tech. Res. Center), Ding, Xuchu (Exyn Tech)

11:30-11:50 ThAT6.4

Learning Vision Based Navigation with a Smartphone Mobile Robot

Witkowski, Ulf (South Westphalia Univ. of Applied Sciences), Bolte, Philipp (South Westphalia Univ. of Applied Sciences), Sitte, Joaquin (Queensland Univ. of Tech)

11:50-12:10 ThAT6.5

Vision Based Neural Network Control of Robot Manipulators with Unknown Sensory Jacobian Matrix

Lyu, Shangke (Nanyang Tech. Univ), Cheah, C. C. (Nanyang Tech. Univ)

ThBT1 301-G050

Rehabilitation Robots 2 (Regular Session)

Chair: Devaraj, Harish — Univ. of Auckland

Co-Chair: McDaid, Andrew — Univ. of Auckland

13:30-13:50 ThBT1.1

Socks Type Actuator That Provides Exercise for Ankle and Toes from the Medical Point of View

Sasanuma, Hayato (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech), Okui, Manabu (Chuo Univ)

13:50-14:10 ThBT1.2

Robotic Amputated Lower Limb for In-Vitro Testing of Osseointegrated Prostheses Devices

Gosha, Dillan (Univ. of Auckland), Perera, Ashani (Univ. of Auckland), Devaraj, Harish (Univ. of Auckland), McDaid, Andrew (Univ. of Auckland)

14:10-14:30 ThBT1.3

Improvement of Supporting Robot for Lower Limb and Evaluation of Output Force in Vertical Direction

Inamura, Natsuki (Yokohama National Univ. Kanagawa Inst. of Industrial S), Shimono, Tomoyuki (Yokohama National Univ), Mizoguchi, Takahiro (Kanagawa Acad. of Science and Tech), Nozaki, Takahiro (Keio Univ), Ishii, Shinichiro (Kanagawa Univ. of Human Services), Ohnishi, Kouhei (Keio Univ)

14:30-14:50 ThBT1.4

A Feasibility Study of Robot-Assisted Ankle Training Triggered by Combination of SSVEP Recognition and Motion Characteristics

Zeng, Xiangfeng (Huazhong Univ. of Science and Tech), Zhu, Guoli (Huazhong Univ. of Science and Tech), Li, Ping (Huazhong Univ. of Science and Tech), Lu, Huaiqing (Huazhong Univ. of Science and Tech), Zhang, Mingming (Univ. of Auckland), Xie, Sheng Quan (Univ. of Leeds)

14:50-15:10 ThBT1.5

Development and Evaluation of a Worker-Wear Assistance Suit with the Adjustable and Concealable Elastic Structure for the Manual Handling Workers

Liao, Yun-Ting (Waseda Univ), Kodama, Kenji (Asahicho Corp), Ishioka, Toshifumi (Asahicho Corp), Lee, Hee-hyol (Waseda Univ), Tanaka, Eiichiro (Waseda Univ)

ThBT2 303-G13

Legged Robots (Regular Session)

Chair: Oldham, Kenn — Univ. of Michigan

Co-Chair: Endo, Gen — Tokyo Inst. of Tech

13:30-13:50 ThBT2.1

Approximated Model Matching Control for Running Robots with Series Elastic Actuators

Chang, Junho (Tokyo Inst. of Tech), Takano, Rin (Tokyo Inst. of Tech), Yamakita, Masaki (Tokyo Inst. of Tech)

13:50-14:10 ThBT2.2

Optimal Periodic Hopping Trajectory Generation for Legged Robots

Ahn, DongHyun (Kookmin Univ), Cho, Baek-Kyu (Kookmin Univ)

14:10-14:30 ThBT2.3

Dynamic Motion Generation in a Hexapod Robot Using Fixed-Point Trajectories of a Simple Model with Period Scaling

Lu, Wei-Chun (National Taiwan Univ), Lin, Pei-Chun (National Taiwan Univ)

14:30-14:50 ThBT2.4

A Study of Gliding Locomotion by Leg-Wheeled Robot with Reduced DOF

Nohara, Kento (Tokai Univ), Inagaki, Katsuhiko (TOKAI Univ)

14:50-15:10 ThBT2.5

Helicopter Lands on Uneven Terrain by Means of Articulated Robotic Legs – Modelling, Simulation and Control Approach

Melia Boix, Daniel (Edinburgh Napier Univ), Goh, Keng (Edinburgh Napier Univ), McWhinnie, James (Edinburgh Napier Univ)

ThBT3 303-G16

Identification and Estimation in Mechatronics 2 (Regular Session)

Chair: Tjahjowidodo, Tegoeh — Nanyang Tech. Univ

Co-Chair: Zhang, Fangfang — Qilu Univ. of Tech. (Shandong Acad. of Sciences)

13:30-13:50 ThBT3.1

Adaptive Tracking Control and Parameter Identification for Uncertain Complex-Variable Chaotic Systems

Zhang, Fangfang (Qilu Univ. of Tech. (Shandong Acad. of Sciences)), Sun, Kai (Qilu Univ. of Tech. (Shandong Acad. of Sciences)), Chen, Yawen (Univ. of Otago), Zhang, Haipo (Univ. of Otago)

13:50-14:10 ThBT3.2

Signal Compression Method Based Heart Rate Model Estimation and PI Control for Cardiac Rehabilitation with

Treadmill

Li, Hong Ying (Pusan National Univ), Kim, Hwan Young (Pusan National Univ), Lee, Min Cheol (Pusan National Univ)

14:10-14:30 ThBT3.3

Synchronization Control of Dual-Drive System in Gantry-Type Machine Tools Based on Extended State Observer

Li, Ping (Huazhong Univ. of Science and Tech), Zhu, Guoli (Huazhong Univ. of Science and Tech), He, Boning (Huazhong Univ. of Science and Tech), Zeng, Xiangfeng (Huazhong Univ. of Science and Tech)

14:30-14:50 ThBT3.4

A Novel Frequency Estimation Method for Accurate Bearing Fault Frequencies Identification

Heryadi, Budi (Inst. Teknologi Bandung), Tjahjowidodo, Tegoeh (Nanyang Tech. Univ), Nurprasetio, Ignatius Pulung (Inst. Teknologi Bandung), Abidin, Zainal (Inst. Teknologi Bandung)

14:50-15:10 ThBT3.5

Experimental Determination of Compliance Values for a Machining Robot

Karim, Ali (Univ. of Stuttgart), Corcione, Emilio (Univ. of Stuttgart), Jäger, Julius (Univ. of Stuttgart), Verl, Alexander (Univ. of Stuttgart)

15:10-15:30 ThBT3.6

Parameters Identification and Adaptation for Condition Monitoring of a Reciprocating Pump Via Torque Analysis

Singh, Karanjot (Nanyang Tech. Univ), Tjahjowidodo, Tegoeh (Nanyang Tech. Univ), Eriksson, Tobias (ABB Pte Ltd), Rajan, Balakrishnan (Nanyang Tech. Univ)

ThBT4 303-G14

Control Application in Mechatronics (Regular Session)

Chair: Rösmann, Christoph TU Dortmund Univ

Co-Chair: Zhu, Xiaocong Zhejiang Univ

13:30-13:50 ThBT4.1

Position Tracking Control of a Magnetorheological Fluid Actuation System

Cao, Jian (Hefei Univ. of Tech), Wang, Linyuan (Zhejiang Univ), Si, Chen (Zhejiang Univ), Zhu, Xiaocong (Zhejiang Univ), Yao, Bin (Zhejiang Univ)

13:50-14:10 ThBT4.2

Novel Interpolation Design for Five-Axis Tool Center Point Path Generation

Tsai, Meng-Shiun (National Chung-Cheng Univ), Tang, Pu-Yang (National Chung Cheng Univ), Wu, Yu-Chan (National Chung Cheng Univ), Ho, Chih-Kai (National Chung Cheng Univ)

14:10-14:30 ThBT4.3

Exploiting Sparse Structures in Nonlinear Model Predictive Control with Hypergraphs

Rösmann, Christoph (TU Dortmund Univ), Krämer, Maximilian (TU Dortmund Univ), Makarow, Artemi (TU Dortmund Univ), Hoffmann, Frank (TU Dortmund Univ), Bertram, Torsten (TU Dortmund Univ)

14:30-14:50 ThBT4.4

Development and Examination of Encrypted Control Systems

Kogiso, Kiminao (The Univ. of Electro-Communications), Baba, Rikuna (The Univ. of Electro-Communications), Kusaka, Masahiro (The Univ. of Electro-Communications)

14:50-15:10 ThBT4.5

Automatic Pressure Compensation in a Fluid Syringe for Blood Glucose Enzyme Dispensing System

Wang, Chen-Chou (National Taipei Univ. of Tech), Cheng, Yuan-Hwei (National Taipei Univ. of Tech), Shaw, Jinsiang (National Taipei Univ. of Tech)

15:10-15:30 ThBT4.6

Contouring Control of a 5-DOF Dual-Arm Robot for Machining Based on Equivalent Errors

Kornmaneesang, Woraphrut (National Chung Cheng Univ), Chen, Shyh-Leh (National Chung Cheng Univ)

ThBT5 302-G20

Energy Harvesting (Regular Session)

Chair: Wu, Yipeng Nanjing Univ. of Aeronautics and Astronautics

Co-Chair: Liang, Junrui ShanghaiTech Univ

13:30-13:50 ThBT5.1

Design and Evaluation of a Knee Support Exoskeleton Using Variable Non-Active Interval for Energy Storage

Babin, Vincent (Tohoku Univ), Paez Granados, Diego Felipe (Univ. of Tsukuba), Kinugawa, Jun (Tohoku Univ), Kosuge, Kazuhiro (Tohoku Univ)

13:50-14:10 ThBT5.2

Electromechanical Modelling and Experimental Verification of Cantilevered Permendur Energy Harvester

Ghodsi, Mojtaba (Sultan Qaboos Univ), Ziaiefar, Hamidreza (Sultan Qaboos Univ), Alam, Khurshid (Sultan Qaboos Univ), Mohammadzaheri, Morteza (Sultan Qaboos Univ), Al-Yahmedi, Amur (Sultan Qaboos Univ), Ghodsi, Mohammad Hadi (Yazd Univ),

Omar, Farag (United Arab Emirates Univ)

14:10-14:30 ThBT5.3

Maximum Energy Output of a Two-Phased Self-Priming Dielectric Elastomer Generator

Mathew, Anup Teejo (National Univ. of Singapore), Koh, Soo Jin Adrian (National Univ. of Singapore)

14:30-14:50 ThBT5.4

Enhancement of Piezoelectric Energy Harvesting Using ABH Structural Tailoring

Liang, Yukun (Nanjing Univ. of Aeronautics and Astronautics), Ji, Hongli (Nanjing Univ. of Aeronautics and Astronautics), Qiu, Jinhao (Nanjing Univ. of Aeronautics and Astronautics), Cheng, Li (The Hong Kong Pol. Univ), Wu, Yipeng (Nanjing Univ. of Aeronautics and Astronautics), Zhang, Chao (Nanjing Univ. of Aeronautics and Astronautics)

14:50-15:10 ThBT5.5

Modeling and Characterization of a Tunable Dual-Frequency Piezoelectric Energy Harvester

Bouhedma, Sofiane (Univ. of Rostock), Hartwig, Haldor (Univ. of Rostock), Hohlfeld, Dennis (Univ. of Rostock)

ThBT6 301-G053

Modeling, Design & Optimization in Mechatronics 3 (Regular Session)

Chair: Singh, Surya The Univ. of Queensland

Co-Chair: Ji, Jingjing Huazhong Univ. of Science and Tech

13:30-13:50 ThBT6.1

Proof of Concept for Using Non-Linear Springs to Integrate Deformable Components' Behavior into a Real-Time Capable Overall System Simulation for Robotics

Kaufmann, Dorit (RWTH Aachen Univ), Rossmann, Juergen (RWTH Aachen Univ)

13:50-14:10 ThBT6.2

A Compact Ratchet Clutch Mechanism for Fine Tendon Termination and Adjustment

Gerez, Lucas (Univ. of Auckland), Liarokapis, Minas (Univ. of Auckland)

14:10-14:30 ThBT6.3

Interactive Calibration and Visual Programming of Reconfigurable Robotic Workcells

Priggemeyer, Marc (RWTH-Aachen Univ), Losch, Daniel (RWTH Aachen Univ), Rossmann, Juergen (RWTH Aachen Univ)

14:30-14:50 ThBT6.4

Experimental Investigation on Flying Motion of Transverse Brachiation Robot

Yang, Zong-Han (National Taiwan Univ. of Science and Tech), Lin, Chi-Ying (National Taiwan Univ. of Science and Tech)

14:50-15:10 ThBT6.5

Cascaded Evolutionary Multi-Objective System Optimization for a Proportional Directional Control Valve

Makarow, Artemi (TU Dortmund Univ), Braun, Jan Holger (TU Dortmund Univ), Rösmann, Christoph (TU Dortmund Univ), Schoppel, Georg (Bosch Rexroth AG), Glowatzky, Ingo (Bosch Rexroth AG), Bertram, Torsten (TU Dortmund Univ)

15:10-15:30 ThBT6.6

A Proposal of Super Long Reach Articulated Manipulator with Gravity Compensation Using Thrusters

Endo, Gen (Tokyo Inst. of Tech), Hagiwara, Tetsuo (Yokohama KH Tech. Corp), Nakamura, Yoshihide (Tokyo Inst. of Tech), Nabae, Hiroyuki (Tokyo Inst. of Tech), Suzumori, Koichi (Tokyo Inst. of Tech)

ThCT2 303-G13

Vehicle Control (Regular Session)

Chair: Erler, Philipp TU Darmstadt

Co-Chair: Chae, Heeseo HanwhaTechwin

16:00-16:20 ThCT2.1

Nonlinear Predictive Control of Combustion and Emissions in Direct Injection Engines with Nozzle Aging

Hofmann, Oliver (Tech. Univ. of Munich), Ponn, Thomas (Tech. Univ. of Munich), Buchmann, Robert (Tech. Univ. of Munich), Rixen, Daniel (Tech. Univ. of Munich)

16:20-16:40 ThCT2.2

Investigating the Perception of Powertrain Shuffle with a Longitudinal Dynamic Driving Simulator

Erler, Philipp (TU Darmstadt), Menig, Angela (TU Darmstadt), Uphaus, Frank (Daimler AG), André Malonga Makosi, Christoph (Daimler AG), Rinderknecht, Stephan (TU Darmstadt), Vogt, Joachim (TU Darmstadt)

16:40-17:00 ThCT2.3

The Anti-Tampering Process and Case Study by the Operating Mode of Various Unmanned Ground Vehicles

Chae, Heeseo (Hanwha Land Systems), Lee, Chang Seong (Hanwah Land Systems), Kim, Tae Hyoung (Hanwha Land Systems)

17:00-17:20 ThCT2.4

Trajectory Tracking for Autonomous Turf-Care Vehicle Using Liouvillian Models

Mai, Christian (Univ. of Southern Denmark), Top, Søren (Ass. Professor), Jouffroy, Jerome (Univ. of Southern Denmark)

ThCT6	301-G053
AI-Enabled Intelligent Systems in Smart Manufacturing and Automation (Invited Session)	
Chair: Chang, Jen-Yuan (James)	National Tsing Hua Univ
Co-Chair: LYU, NING-YUAN	Industrial Tech. Res. Inst
Organizer: Chang, Jen-Yuan (James)	National Tsing Hua Univ

16:00-16:20 ThCT6.1

Industrial Anomaly Detection and One-Class Classification Using Generative Adversarial Networks

Lai, Yu-Ting (National Chiao Tung Univ), Hu, Jwu-Sheng (National Chiao Tung Univ. and Industrial Tech. Res. Ins), Tsai, Ya-Hui (Industrial Tech. Res. Inst. (ITRI)), chiu, wei-yao (Industrial Tech. Res. Inst. (ITRI))

16:20-16:40 ThCT6.2

Navigation with Image Tracking for a Quadrotor UAV

Chang, Keng-Hao (Justin) (Industrial Tech. Res. Inst), Shiao, Ying Shing (National Changhua Univ. of Education), Lyu, Ning-Yuan (Industrial Tech. Res. Inst)

16:40-17:00 ThCT6.3

Defect Detection on Randomly Textured Surfaces by Convolutional Neural Networks

Jung, Shing Yun (National Chiao Tung Univ), Tsai, Ya-Hui (Industrial Tech. Res. Inst. (ITRI)), Chiu, Wei-Yao (Industrial Tech. Res. Inst. (ITRI)), Hu, Jwu-Sheng (National Chiao Tung Univ. and Industrial Tech. Res. Ins), Sun, Chuen-Tsai (National Chiao Tung Univ)

17:00-17:20 ThCT6.4

A Tri-Dipole Based Location and Orientation Estimation Method in Near Magnetic Field

Lo, Sheng-Wen (Industrial Tech. Res. Inst), Sun, Kuan-Chun (Industrial Tech. Res. Inst), Hsieh, Shih-Ho (National Chiao-Tung Univ), Hu, Jwu-Sheng (National Chiao Tung Univ. and Industrial Tech. Res. Ins), Chang, Jen-Yuan (James) (National Tsing Hua Univ)