Technical Sponsorship Organizations

2018 IEEE/ASME International Conference on Advanced Intelligent Mechatronics

July 9 – 12, 2018
Auckland, New Zealand
# Technical Program at a Glance

## AIM 2018 Technical Program Monday July 9, 2018

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<th>Track T1</th>
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<th>10:15-11:30 MT1 (Morning Session A)</th>
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<td>10:20-12:00 W1WAM_AT2</td>
<td>10:20-12:00 MT1 (Morning Session B)</td>
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<td>10:30-11:45 MT2 (Morning Session A)</td>
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<td>Track T2</td>
<td>10:45-12:00 MT2</td>
<td>10:45-12:00 MT2 (Morning Session B)</td>
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## AIM 2018 Technical Program Tuesday July 10, 2018

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<th>Track T1</th>
<th>09:00-10:15 W1WAM_AT1</th>
<th>10:15-11:45 MT3 (Morning Session A)</th>
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<td>11:00-12:15 Welcome Function</td>
<td>10:30-11:45 MT3 (Morning Session B)</td>
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<td>Track T2</td>
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## AIM 2018 Technical Program Wednesday July 11, 2018

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<th>Track T1</th>
<th>09:00-10:15 W1WAM_AT1</th>
<th>10:15-11:45 MT4 (Morning Session A)</th>
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<tr>
<td></td>
<td>11:00-12:15 Welcome Function</td>
<td>10:30-11:45 MT4 (Morning Session B)</td>
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<tr>
<td>Track T2</td>
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<tr>
<td>09:15-10:30</td>
<td>TPC1</td>
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<td>10:00-10:30</td>
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<tr>
<td>10:30-12:30</td>
<td>TIA1</td>
<td>TIA2</td>
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<tr>
<td></td>
<td>301-0050</td>
<td>302-013</td>
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<tr>
<td></td>
<td>Physical Human-Robot Interactions and Human Assistive Systems</td>
<td>Mobile Robots 2</td>
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<td>12:30-13:30</td>
<td>Lunch Break</td>
<td>302-091</td>
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<tr>
<td>13:30-15:30</td>
<td>TIP1</td>
<td>TIP2</td>
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<tr>
<td></td>
<td>301-059</td>
<td>303-013</td>
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<tr>
<td></td>
<td>Rehabilitation Robotics 2</td>
<td>Legged Robots</td>
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<td>15:30-16:00</td>
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<td>16:00-17:20</td>
<td>TCT1</td>
<td>TCT2</td>
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<tr>
<td></td>
<td>301-009</td>
<td>303-013</td>
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<tr>
<td></td>
<td>No Session</td>
<td>Vehicle Control</td>
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<tr>
<td>17:20-17:30</td>
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<td>302-091 &amp; 090</td>
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**AIM 2018 Technical Program Thursday July 12, 2018**
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
09:00 – 09:45          ROOM 109-B28
Chair: Aw, Kean
Co-Chair: Tang, Lihua

Smart Mechatronics in Medicine
J. Geoffrey Chase, Distinguished Professor, University of Canterbury, New Zealand

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

Human Machine Interfaces 1 (Regular Session)

Chair: Bi, Luzheng
Co-Chair: Meng, Wei

Beijing Inst. of Tech
Wuhan Univ. of Tech

11:00-11:20

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

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 (Instr. for Infocomm Res. A*STAR)

11:40-12:00

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

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

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

**Robot Dynamics and Control (Regular Session)**

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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speakers</th>
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</thead>
<tbody>
<tr>
<td>11:00-11:20</td>
<td>TuAT2.1</td>
<td>Study on Robust Control of Industrial Manipulator for Assembly Based on SMCSPO</td>
<td>Jung, Min Gyu (Pusan National Univ), Yoon, JinGon (Pusan Univ), Park, Sunoh (Pusan National Univ), Lee, Min Cheol (Pusan National Univ)</td>
</tr>
<tr>
<td>11:20-11:40</td>
<td>TuAT2.2</td>
<td>A Hybrid Control Strategy for Dual-Arm Object Manipulation Using Fused Force/Position Errors and Iterative Learning</td>
<td>Chen, Bo-Hsun (National Taiwan Univ), WANG, YU-HSUN (National Taiwan Univ), Lin, Pei-Chun (National Taiwan Univ)</td>
</tr>
<tr>
<td>11:40-12:00</td>
<td>TuAT2.3</td>
<td>Force Control in Time-Delay Systems Based on Equivalent Torsional and Elastic Forces Feedback</td>
<td>Nagatsu, Yuki (Chuo Univ), Hashimoto, Hideki (Chuo Univ)</td>
</tr>
<tr>
<td>12:00-12:20</td>
<td>TuAT2.4</td>
<td>Precise In-Hand Motion Control of Objects Using Soft Actuators and Visual Feedback</td>
<td>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)</td>
</tr>
<tr>
<td>12:20-12:40</td>
<td>TuAT2.5</td>
<td>Task-Space Cooperative Tracking Control of Multi-Robot Systems with Unknown Parameters and Time Delays</td>
<td>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)</td>
</tr>
<tr>
<td>12:40-13:00</td>
<td>TuAT2.6</td>
<td>Snake-Like Robot with Controllable Side-Thrust Links: Dynamical Modeling and a Variable Undulation Motion</td>
<td>Takagi, Yuki (Osaka Univ), Sueoka, Yuichiro (Osaka Univ), Ishikawa, Masato (Osaka Univ), Osaka, Koichi (Osaka Univ)</td>
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### TuAT3

**Identification and Estimation in Mechatronics 1 (Regular Session)**

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<tbody>
<tr>
<td>11:00-11:20</td>
<td>TuAT3.1</td>
<td>Enhanced Robot Calibration by Minimization of TCP Drifts During Reorientation</td>
<td>Niu, Bin (ABB Robotics R&amp;D Center)</td>
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<tr>
<td>11:20-11:40</td>
<td>TuAT3.2</td>
<td>Dynamic Modelling and Load Identification of Industrial Robot Using Improved Particle Swarm Optimization</td>
<td>Tao, Jieyu (Huazhong Univ. of Science &amp; Tech), Ye, Bosheng (Huazhong Univ. of Science &amp; Tech), Xie, Yuanlong (Huazhong Univ. of Science and Tech), Tang, Xiaoqi (Huazhong Univ. of Science &amp; Tech), Song, Bao (School of Mechanical Science &amp; Engineering)</td>
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<tr>
<td>11:40-12:00</td>
<td>TuAT3.3</td>
<td>On-Line Parameter Estimation of an Air Handling Unit Model: Experimental Results Using the Modulating Function Method</td>
<td>Ionesi, Ana (Univ. of Southern Denmark), Jouffroy, Jerome (Univ. of Southern Denmark)</td>
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<tr>
<td>12:00-12:20</td>
<td>TuAT3.4</td>
<td>A Simple Asymmetric Hysteresis Model for Displacement-Force Control of Piezoelectric Actuators</td>
<td>Zarif Mansour, Sepehr (The Univ. of British Columbia), Seethaler, Rudolf (The Univ. of British Columbia), Fleming, Andrew (The Univ. of Newcastle)</td>
</tr>
<tr>
<td>12:20-12:40</td>
<td>TuAT3.5</td>
<td>Identification of Viscous and Coulomb Friction in Motion Constrained Systems</td>
<td>Yerlikaya, Umit (FNSS Defense Systems Inc), Balkan, Tuna (Middle East Tech. Univ)</td>
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### TuAT4

**Actuators 1 (Regular Session)**

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<tr>
<td>11:00-11:20</td>
<td>TuAT4.1</td>
<td>Similarity-Based Feedback Control for Linear Operation of Piezoelectric Actuators</td>
<td>Poik, Mathias (TU Wien), Kohl, Dominik (TU Wien), Schitter, Georg (TU Wien)</td>
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<tr>
<td>11:20-11:40</td>
<td>TuAT4.2</td>
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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)

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), Tadokoro, Satoshi (Tohoku Univ)

Equivalent Circuit and Frequency Response of the Distributed Eddy Current in an Electromagnetic Transducer
Ikegame, Toru (Nagoya Univ), Takagi, Kentaro (Nagoya Univ)

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
Design and Control of Micro and Nano Precision Mechatronic Systems (Invited Session)
Chair: Ruppert, Michael G. Co-Chair: Sadeghian, Hamed Organizer: Ruppert, Michael G. Organizer: Yong, Yuen Kuan Organizer: Sadeghian, Hamed
The Univ. of Newcastle TNO The Univ. of Newcastle The Univ. of Newcastle 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
Artificial Intelligence and Machine Learning (Regular Session)
Chair: Liarokapis, Minas 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), Wiellitzka, Mark (Leibniz Univ. Hannover), Ortmaier, Tobias (Leibniz Univ. Hannover)
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)
### 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)

### 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)

### 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)

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### TuBT1

**Medical Robotics & Biomechantronics** (Regular Session)

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<tr>
<td></td>
<td>Simulation of Muscle-Powered Jumping with Hardware-In-The-Loop Ground Interaction</td>
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<td>Eberhard, Enrico (Royal Veterinary Coll), Richards, Christopher (The Royal Veterinary Coll)</td>
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<td>14:40-15:00</td>
<td>TuBT1.3</td>
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<tr>
<td></td>
<td>Development and Kinematic Analysis of a Redundant, Modular and Backdrivable Laparoscopic Surgery Robot</td>
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<td>Alassi, Alaa (Bahcesehir Univ), Yilmaz, Nural (Marmara Univ), Bazman, Merve (Marmara Univ), Gur, Berke (Bahcesehir Univ), Tumerdem, Ugur (Marmara Univ)</td>
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<tr>
<td>15:00-15:20</td>
<td>TuBT1.4</td>
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<td>Coordination of the Biarticular Actuators Based on Mechanical Output Power in an Explosive Jump Experiment</td>
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<td>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)</td>
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### TuBT2

**Motion, Vibration and Noise Control** (Regular Session)

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<tr>
<td>14:40-15:00</td>
<td>TuBT2.3</td>
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<tr>
<td></td>
<td>Dynamics and Oscillation Control of Helicopters Carrying Large-Size Loads</td>
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<td>Zhang, Yifan (Beijing Inst. of Tech), HUANG, JIE (Beijing Inst. of Tech), Katupiliya, Jayantha (The Univ. of New South Wales)</td>
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<tr>
<td>15:00-15:20</td>
<td>TuBT2.4</td>
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<tr>
<td></td>
<td>A Calculation Method for the Stability Lobes of 3-DOF Boring</td>
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<tr>
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<td>Lin, Zhihang (Tsinghua Univ), Feng, Pingfa (Tsinghua Univ), Zhang, Jianfu (Tsinghua Univ), Yu, Dingwen (Tsinghua Univ), Wu, Zhijun (Tsinghua Univ)</td>
</tr>
</tbody>
</table>
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)

Merging Control for Automated Vehicles Using Decentralized Model Predictive Control  
Hayashi, Yasuhiro (Keio Univ), Namerkawa, Toru (Keio Univ)

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)

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)

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)

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)

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. Hannover)

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)

Robotic Bolt Insertion and Tightening Based on In-Hand Object Localization and Force Sensing  
Nozu, Kentaro (Ritsumeikan Univ), Shimonomura, Kazuhiro (Ritsumeikan Univ)

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)

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

Flexible Sheet Actuator That Generates Bidirectional Traveling Waves  
Watanabe, Masahiro (Tohoku Univ), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

Soft Manipulator Using Thin McKibben Actuator  
Mohd Faudzi, Ahmad ’Athif (Univ. Teknologi Malaysia), Azmi, Nor Iskandar (Univ. Teknologi Malaysia), Sayahkaraj, Mostafa (Univ. Teknologi Malaysia), Wong, Liang Xuan (Univ. Teknologi Malaysia), Suzumori, Koichi (Tokyo Inst. of Tech)
Wang, Fei (Tianjin Univ), Chen, Longzhen (Tianjin Univ), Wang, Kai (Tianjin Univ), Yang, Yuhu (Tianjin Univ), Liu, Xianzeng (Tianjin Univ)

15:00-15:20

**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

**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

**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
Co-Chair: Wang, Fei
Organizer: Tao, Kai
Organizer: Wang, Fei
Chair: Tao, Kai
Co-Chair: Wang, Fei
Organizer: Tao, Kai
Organizer: Wang, Fei
Northwestern Pol. Univ
Southern Univ. of Science and Tech. (SUSTech)
Northwestern Pol. Univ
Southern Univ. of Science and Tech. (SUSTech)

14:00-14:20

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


14:20-14:40

**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

**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

**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, Zhaoxu (Ocean Univ. of China), Chen, Tao (Soochow Univ), Sun, Lining (Harbin Inst. of Tech)

15:20-15:40

**Vibrational Energy Loss Analysis of a MEMS Disk Resonator Gyroscope**

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

15:40-16:00

**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

**Vibration-Driven Micro Energy Harvesting with Piezoelectric Materials**

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

**TuBT6**

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

Chair: Chase, Geoff
Co-Chair: Patton, Ron

14:00-14:20

**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

**Topology Optimization of Leaf Flexures for Stiffness Ratio Maximization in Compliant Mechanisms**
14:40-15:00 TuBT6.3

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

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

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, Jinyang, 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, Mahatb, Harish, Giffney, Timothy, Yellapantula, Kartik, Aw, Kean

High Accuracy Track Tracing for Rice Drill Seeder on Uneven Paddy Fields (TuP6)
Zhang, Yan, Li, Yanning, 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)
08:15 – 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

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
Design of a Lightweight Forearm Exoskeleton for Fine-Motion Rehabilitation
Su, Yin-Yu (National Cheng Kung Univ. Department of Mechanical Engineering), Wu, Kuan-Yi (National Cheng Kung Univ.), Lin, Ching-Hui (National Cheng Kung Univ. Department of Mechanical Engineering), Yu, Ying-Lung (National Cheng Kung Univ. Department of Mechanical Engineering), Lan, Chao-Chieh (National Cheng Kung Univ.)

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

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.), Matsui, Naruki (Meikou Brace Co., Ltd.), Sugawara, Masanori (Meikou Brace Co., Ltd.)

Development of a Reconfigurable Wrist Rehabilitation Device with an Adaptive Forearm Holder
Xu, Dong (Tongji Zhejiang Coll.), Zhang, Mingming (Tongji Zhejiang Coll.), Sun, Jun (Tongji Zhejiang Coll.), Han, Jing (Tongji Zhejiang Coll.), Li, Yibin (Tongji Zhejiang Coll.), Li, Xiaolong (Tongji Zhejiang Coll.), Xie, Sheng Quan (Univ. of Leeds)

Hand/Finger Robotic Assistive Devices for Passive Rehabilitation
Chang, Jen-Yuan (James) (National Tsing Hua Univ.), Huang, Jian-Jia (Rehabotics Medical Tech Corp.)

Context-Aware Sensing and Wearable Robots
Lo, Benny (Imperial College London)
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 WAT3.1

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 WAT3.2

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 WAT3.3

Active Planning of Robot Navigation for 3D Scene Exploration
Chen, Wenzhou (Zhejiang Univ), Liu, Yong (Zhejiang Univ)
11:50-12:10 WAT3.4

High-Resolution 3D Optical Sensing and Real-Time 3D Video Data Streaming
12:10-12:30 WAT3.5

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)
12:10-12:30 WAT3.6

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 WAT4.1

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 WAT4.2

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 WAT4.3

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 WAT4.4

Design of an Innovative Cylindrical Spring with a Negative Stiffness
11:50-12:10 WAT4.5

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)
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)

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), Nabea, Hiroyuki (Tokyo Inst. of Tech)

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)

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)

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)

Helical Contouring Control with Online Iterative Learning Control
Dao, Viet-Tu (National Chung Cheng Univ), Chen, Shyh-Leh (National Chung Cheng Univ)

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)

Pump-Pressure-Compensation-Based Adaptive Neural Torque Control of a Hydraulic Excavator with Open Center Valves
Li, Yong (Zhejiang Univ), Wang, Qingfeng (Zhejiang Univ)

Deep Learning Based on Smooth Driving
Kim, Riseo (Pusan National Univ), Kim, Dongeun (Pusan National Univ), Lee, Jangmyung (Busan National Univ. Busan, Korea)

Disturbance Observer-Based $H_{\infty}$ Control of the T-S Fuzzy Model under Imperfect Premise Matching
Hwang, Soungwhan (Yonsei Univ. Seoul), Park, Jin Bae (Yonsei Univ. Seoul), Joo, Young Hoon (Kunsan National Univ)

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)

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, Mitsuihiro (Waseda Univ), Sugano, Shigeki (Waseda Univ)
### 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)

### 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)

### 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)

### Mobile Robots 1 (Regular Session)
Chair: Jiang, Zainan
Co-Chair: Shi, Yan
Harbin Inst. of Tech
Beihang Univ

#### 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)

#### Conceptual Design of a Wheel-Track Hybrid Mobile Robot
Han, Zechao (NUDT), Xu, Haijun (NUDT), Xu, Xiaojun (NUDT), Zhang, Xiang (NUDT)

#### Soft Simple Compact Valve Inducing Self-Excited Vibration Aimed for Mobile Robots Unnecessary for Electricity
Miyaiki, Yuji (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)

#### 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)

### Mobile Robots 2 (Regular Session)
Chair: Lee, Jangmyung
Co-Chair: Aoyama, Tadayoshi
Busan National Univ.
Nagoya Univ

#### 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)

#### 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)

#### 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)

### Sensors and Sensing Systems 2 (Regular Session)
Chair: Lee, Jangmyung
Co-Chair: Aoyama, Tadayoshi
Busan National Univ.
Nagoya Univ

#### 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)

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

#### 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)
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)

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), MacDonald, Bruce (Univ. of Auckland), Richards, Peter John (Univ. of Auckland)

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)

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)

Towards Accurate Shape Reconstruction of Compact Bionic Handling Arm
Singh, Inderjeet (CRIStAL, CNRS UMR 9189, Univ. of Lille1), Amara, Yacine (Ec. Militaire Pol), Singh, Manarshjot (Pol. Lille), Merzouki, Rochdi (CRIStAL, CNRS UMR 9189, Univ. of Lille1)

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)

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)

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)
WBT5.5
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)
15:10-15:30

WBT6
Manufacturing (Regular Session)
Chair: Lin, Ming-Tsung, National Formosa Univ
Co-Chair: Zhong, Ray Y, Univ. of Auckland
13:30-13:50

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. Hannover)
13:50-14:10

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

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

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

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

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)
15:30-15:50

WCT1
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

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

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

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, Hiroshi (Kondo Kagaku, Co., Ltd), Lee, Hee-hyol (Waseda Univ), Tanaka, Eiichiro (Waseda Univ)
17:00-17:20

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

Redundancy Resolution of an Index Finger Exoskeleton Using Self Organizing Map
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
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

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

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

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

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

17:00-17:20

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

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, Gulafshan (National Univ. of Science and Tech), Ayaz, Yasar (National Univ. of Sciences and Tech. (NUST))

16:20-16:40

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

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

16:40-17:00

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

Ammann, Nikolaus (German Aerospace Center (DLR))

17:00-17:20

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

Fujiwara, Ami (Chuo Univ), Nakatake, Toyoharu (Chuo Univ), Tadami, Naoki (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

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)

17:40-18:00

Pneumatic Actuated Systems (Regular Session)

Chair: Alici, Gursel
Univ. of Wollongong

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

16:00-16:20
Morley-Drabble, Courtney (The Univ. of Queensland), Singh, Surya (The Univ. of Queensland)

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)

3D Printed Helical Soft Pneumatic Actuators
Hu, Weiping (Univ. of Wollongong), Li, Weihua (Univ. of Wollongong), Alici, Gursel (Univ. of Wollongong)

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)

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)

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)

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)

Development 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)

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)

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)

Optimization and 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)

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)
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 for Robotics

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
Co-Chair: Yi, Jingang
Organizer: Ueda, Jun
Organizer: Lee, Kok-Meng
Organizer: Yi, Jingang

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
Co-Chair: Funabora, Yuki

17:00-17:20
WCT6.4
Actuator-Based Optimization Motion Cueing Algorithm
Ellenschn, 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)
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<th>Time</th>
<th>Session</th>
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<th>Authors</th>
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<tr>
<td>10:30-10:50</td>
<td>ThAT2.1</td>
<td>Long-Mover: Flexible Tube In-Pipe Inspection Robot for Long Distance and Complex Piping</td>
<td>Miyasaka, Keniato (Tokyo Inst. of Tech), Kawano, Ginjiro (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech)</td>
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<tr>
<td>10:50-11:10</td>
<td>ThAT2.2</td>
<td>Autonomous Navigation of Electric Wheelchairs in Urban Areas on the Basis of Self-Generated 2D Drivable Maps</td>
<td>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)</td>
</tr>
<tr>
<td>11:10-11:30</td>
<td>ThAT2.3</td>
<td>An Inchworm-Inspired Rigid-Reinforced Soft Robot with Combined Functions of Locomotion and Manipulation</td>
<td>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 &amp; Tech), Yue, Li (Xi'an Jiaotong Univ)</td>
</tr>
<tr>
<td>11:30-11:50</td>
<td>ThAT2.4</td>
<td>A Mechanical Design for Efficient Hopping of Planetary Rover on Soft Soil</td>
<td>Sakamoto, Kosuke (The Univ. of Tokyo), Kubota, Takashi (Jaxa Isas), Otsuki, Masatsugu (Japan Aerospace Exploration Agency), Maeda, Takao (Chuo Univ), Yoshikawa, Keni (JAXA)</td>
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<tr>
<td>11:50-12:10</td>
<td>ThAT2.5</td>
<td>Step-Height Detection for the Umbrella Wheel Stair-Climber Using Model Prediction</td>
<td>Iversen, Simon (Univ. of Southern Denmark), Jouffroy, Jerome (Univ. of Southern Denmark)</td>
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<tr>
<td>12:10-12:30</td>
<td>ThAT2.6</td>
<td>Majority Rule Sensor Fusion System with Particle Filter for Robust Robot Localization</td>
<td>Ohashi, Nozomu (Nagoya Univ), Funabara, Yuki (Nagoya Univ), Doki, Shinji (Nagoya Univ), Doki, Kae (Aichi Inst. of Tech)</td>
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<tr>
<td>10:30-11:00</td>
<td>ThAT3.1</td>
<td>Fault Detection and Diagnosis (Regular Session)</td>
<td>Chair: Dhupia, Jaspreet Univ. of Auckland Co-Chair: Zhang, Jianfu Tsinghua Univ</td>
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<tr>
<td>10:50-11:10</td>
<td>ThAT3.2</td>
<td>Study on Health Assessment and Residual Useful Life Prediction of Wind Turbine</td>
<td>Deng, Chao (Huazhong Univ. of Science &amp; 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)</td>
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<tr>
<td>11:10-11:30</td>
<td>ThAT3.3</td>
<td>Modeling Method for Bolted Joint Interfaces Based on Transversely Isotropic Virtual Materials</td>
<td>Zha, Yunjian (Tsinghua Univ), Zhang, Jianfu (Tsinghua Univ), Yu, Dingwen (Tsinghua Univ), Feng, Pingfa (Tsinghua Univ), Lin, zhichang (Tsinghua Univ)</td>
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<tr>
<td>11:30-11:50</td>
<td>ThAT3.4</td>
<td>A Critical Investigation of Hilbert-Huang Transform Based Envelope Analysis for Fault Diagnosis of Gears</td>
<td>Dev Choudhury, Madhurjya (Univ. of Auckland), Hong, Liu (Wuhan Univ. of Tech), Dhupia, Jaspreet (Univ. of Auckland)</td>
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<tr>
<td>10:30-10:50</td>
<td>ThAT4.1</td>
<td>&quot;Dynamic Closest Point&quot; Identification and Estimation for Tumbling Target Capturing</td>
<td>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)</td>
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<tr>
<td>10:50-11:10</td>
<td>ThAT4.2</td>
<td>Preliminary Design of a Pseudo-Inertia Adjustable Mechanism Based on Bidirectional Releasing of Stored Kinetic Energy</td>
<td>Zhang, Peizhi (Waseda Univ), Kamezaki, Mitsuhiro (Waseda Univ), Otsuki, Kenshiro (Waseda Univ), He, Shan (Waseda Univ), Aguirre Domínguez, Gonzalo (Waseda Univ. Sugano Lab), Sugano, Shigeki (Waseda Univ)</td>
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<tr>
<td>11:10-11:30</td>
<td>ThAT4.3</td>
<td>A Piezoelectric Two-Degree-Of-Freedom Nanostepping Motor with a Positioning Sensor</td>
<td>Cheng, Chiao-Hua (National Chiao Tung Univ), Hung, Shao-Kang (National Chiao Tung Univ)</td>
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<tr>
<td>10:30-10:50</td>
<td>ThAT3.5</td>
<td>Optimization of an Optically Controlled Bistable Micro-Actuator</td>
<td>Shi, Zhichao (Univ. De Tech. De Compliègne), Al Hajjar, Hani (Univ. De Tech. De Compliègne), Prelle, Christine (Univ. De Tech. De Compliègne), Liu, Xingxing (China Agricultural Univ), Ilou, Lucie (Univ. De Tech. De Compliègne), Lamarque, Frédéric (Univ. De Compliègne)</td>
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</table>
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 Vehicel
Yang, Liman (Beihang Univ), Zhai, Zhuangzhuang (Beihang Univ), Li, Yunhua (Beihang Univ), Huang, Yuntao (Beijing Aerospace Automatic Control Inst)

ThAT5
Control, Simulation and Condition Monitoring for Electromechanical Systems (Invited Session)  302-G20
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 University), 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
Image Processing and Machine Vision (Regular Session)  301-G053
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
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<tr>
<td>13:30-13:50</td>
<td>ThBT1.1</td>
<td>Socks Type Actuator That Provides Exercise for Ankle and Toes from the Medical Point of View</td>
<td>Sasanuma, Hayato (Tokyo Inst. of Tech), Tsukagoshi, Hideyuki (Tokyo Inst. of Tech), Okui, Manabu (Chuo Univ)</td>
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<tr>
<td>13:50-14:10</td>
<td>ThBT1.2</td>
<td>Robotic Amputated Lower Limb for In-Vitro Testing of Osseointegrated Prostheses Devices</td>
<td>Gosha, Dillan (Univ. of Auckland), Perera, Ashani (Univ. of Auckland), Devaraj, Harish (Univ. of Auckland), McDaid, Andrew (Univ. of Auckland)</td>
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<tr>
<td>14:10-14:30</td>
<td>ThBT1.3</td>
<td>Improvement of Supporting Robot for Lower Limb and Evaluation of Output Force in Vertical Direction</td>
<td>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)</td>
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<td>14:50-15:10</td>
<td>ThBT1.5</td>
<td>A Feasibility Study of Robot-Assisted Ankle Training Triggered by Combination of SSVEP Recognition and Motion Characteristics</td>
<td>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, Huaqing (Huazhong Univ. of Science and Tech), Zhang, Mingming (Univ. of Auckland), Xie, Sheng Quan (Univ. of Leeds)</td>
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**Legged Robots (Regular Session)**

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<td>13:30-13:50</td>
<td>ThBT2.1</td>
<td>Approximated Model Matching Control for Running Robots with Series Elastic Actuators</td>
<td>Chang, Junho (Tokyo Inst. of Tech), Takano, Rin (Tokyo Inst. of Tech), Yamakita, Masaki (Tokyo Inst. of Tech)</td>
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<tr>
<td>14:10-14:30</td>
<td>ThBT2.2</td>
<td>Optimal Periodic Hopping Trajectory Generation for Legged Robots</td>
<td>Ahn, DongHyun (Kookmin Univ), Cho, Baek-Kyu (Kookmin Univ)</td>
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<tr>
<td>14:50-15:10</td>
<td>ThBT2.5</td>
<td>A Study of Gliding Locomotion by Leg-Wheeled Robot with Reduced DOF</td>
<td>Nohara, Kento (Tokai Univ), Inagaki, Katsuhiro (TOKAI Univ)</td>
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**Identification and Estimation in Mechatronics 2 (Regular Session)**

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<td>13:30-13:50</td>
<td>ThBT3.1</td>
<td>Adaptive Tracking Control and Parameter Identification for Uncertain Complex-Variable Chaotic Systems</td>
<td>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)</td>
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<tr>
<td>13:50-14:10</td>
<td>ThBT3.2</td>
<td>Signal Compression Method Based Heart Rate Model Estimation and PI Control for Cardiac Rehabilitation with</td>
<td></td>
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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)
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
15:10-15:30  ThBT3.6

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), Makarov, 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
Kommaneesang, Woraphrut (National Chung Cheng Univ), Chen, Shyh-Leh (National Chung Cheng Univ)
15:10-15:30  ThBT4.6
**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)

**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), Cheng, Li (The Hong Kong Pol. Univ), Wu, Yipeng (Nanjing Univ. of Aeronautics and Astronautics), Zhang, Chao (Nanjing Univ. of Aeronautics and Astronautics)

**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)

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

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

**A Compact Ratchet Clutch Mechanism for Fine Tendon Termination and Adjustment**

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

**Interactive Calibration and Visual Programming of Reconfigurable Robotic Workcells**

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

**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)

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

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

**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), Nabea, Hiroyuki (Tokyo Inst. of Tech), Suzumori, Koichi (Tokyo Inst. of Tech)
<table>
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<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Time</th>
</tr>
</thead>
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<tr>
<td>ThCT6.3</td>
<td>Defect Detection on Randomly Textured Surfaces by Convolutional Neural Networks</td>
<td>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)</td>
<td>16:40-17:00</td>
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