MESA 2019 - 15th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications
MONDAY, AUGUST, 19

MESA-2
BIO-INSPIRED ROBOTICS AND SOFT ROBOTICS
Session MESA-2-1
Bio-Inspired Robotics and Soft Robotics
San Clemente   9:10am - 10:30am

Session Organizer: **Chris Pretty**, *University of Canterbury, Christchurch, New Zealand*

9:10am   Dynamical Modelling and Control of Snake-like Motion in Vertical Plane for Locomotion in Unstructured Environments
Technical Paper Publication. IDETC2019-97227

Mohammadali Javaheri Koopaee, University of Canterbury, Christ Church, New Zealand, **Chris Pretty**, *University of Canterbury, Christchurch, New Zealand,* **Koen Classens**, *University of Eindhoven, Eindhoven, Netherlands,* **Xiaoqi Chen**, *Univ of Canterbury, Christchurch, New Zealand*

9:36am   ANALYSIS OF A MULTIBODY ELASTODYNAMIC MODEL FOR CLOSED-LOOP KINEMATIC MECHANISMS
Technical Paper Publication.
IDETC2019-97901

Matteo C. Palpacelli, Luca Carbonari, Stefano Brillarelli, Massimo Callegari, Polytechnic University of Marche, Ancona, Italy

10:02am   Computer Vision-Based Object Recognition and Automatic Pneumatic Soft Gripping
Technical Paper Publication. IDETC2019-97976

Ebrahim Shahabi, Wei-Hao Lu, Po Ting Lin, National Taiwan University of Science and Technology, Taipei, Taiwan, **Chin-Hsing Kuo**, *University of Wollongong, NSW 2522, Australia*

MESA-9
MECHATRONICS AND INDUSTRY 4.0
Session MESA-9-1
Mechatronics and Industry 4.0
Palos Verdes A 9:10am - 10:30am

Session Organizer: **Tapio Heikkilä**, *VTT Technical Research Centre of Finland, Oulu, OO, Finland*
Session Co-Organizer: **Emanuele Frontoni**, *Università Politecnica delle Marche, Ancona, Italy, Italy*

9:10am   Heuristic approach for warehouse resources and production planning optimization: an industry case study
Technical Paper Publication.
IDETC2019-97768

Roberto Rosetti, Università Politecnica delle Marche, Ancona, Italy, Italy, **Mirco Sturari**, *Università Politecnica delle Marche, Dipartimento di Ingegneria dell' Informazione, Ancona, Italy, Italy,* **Emanuele Frontoni**, *Università Politecnica delle Marche, Ancona, Italy, Italy,* **Jelena Loncarski**, *Department of Engineering Sciences, Division of Electricity, Uppsala University, Uppsala, Ancona, Sweden,* **Anselmo Cicchitti, Enrico Iavazzo, Diego Gualtieri**, *Fameccanica.Data SPA, Pescara, Italy, Italy*

9:36am   An event based machine learning framework for predictive maintenance in Industry 4.0
Technical Paper Publication.
IDETC2019-97917

Matteo Calabrese, Martin Cimmino, Martina Manfrin, ACCENTURE, Milan, Italy, **Francesca Fiume**, *Accenture, 20154, Italy,* **Dimos Kapetis**, *Accenture, Milan, Italy,* **Maura Mengoni, Silvia Ceccacci, Emanuele Frontoni, Marina Paolanti**, *Università Politecnica delle Marche, Ancona, Italy,* **Alberto Carrotta, Giuseppe Toscano**, *Biesse Group, Pesaro, Italy*

10:02am   On-line programming of robot skills
Technical Paper Publication. IDETC2019-97958

Tapio Heikkilä, Janne Saukkoriipi, VTT Technical Research Centre of Finland, Oulu, OO, Finland, **Jari Ahola**, *VTT Technical Research Centre of Finland Ltd, Oulu, OO, Finland,* **Tuomas Seppälä**, *VTT Technical Research Centre of Finland, Oulu, Finland*

MESA-4
MECHATRONIC AND EMBEDDED SYSTEMS FOR AGRICULTURE 4.0
Session MESA-4-1
Mechatronic and Embedded Systems for Agriculture 4.0
San Clemente   10:50am - 12:10pm

Session Organizer: **Abhijit Nagchaudhuri**, *Univ Of Maryland Eastern Shore, Princess Anne, MD, United States*
Session Co-Organizer: **Manoj Karkee**, *Washington State University, Prosser, WA, United States*

10:50am   Deep Learning Automatic Inspections of Mushroom Substrate Packaging for PP-bag Cultivations
Technical Paper Publication. IDETC2019-97011

Rong-yuan Jou, National Formosa Univ, Yuulin 632, Taiwan, **Tseng-Wei Li**, *National Formosa University, Huwei/Yunlin, Taiwan*

11:10am A Novel Fruit Removal Mechanism for an Olive Harvester
Technical Presentation. IDETC2019-97093

Taymaz Homayouni, University of California Merced, Merced, CA, United States, **Arash Mohammadi Toudeshki**, *University of California Merced, Mrced, CA, United States,* **Reza Ehsani**, *University of California Merced, Merced, CA, United States*

11:30am   OVERVIEW OF REMOTE SENSING EFFORTS AT UNIVERSITY OF MARYLAND EASTERN SHORE
Technical Paper Publication. IDETC2019-98457

Abhijit Nagchaudhuri, Univ Of Maryland Eastern Shore, Princess Anne, MD, United States, **Travis Ford, Christopher Hartman**, *University of Maryland Eastern Shore, Princess Anne, MD, United States*

11:50am   Design and development of a 5R 2DOF parallel robot arm for handling paper pot seedlings in a vegetable transplanter
Technical Presentation. IDETC2019-98177

Vikas Paradkar, Rahul Sundaram, Hifjur Raheman, Indian Institute of Technology, Kharagpur, kharagpur, West Bengal, India

MESA-5

DISTURBANCE REJECTION CONTROL
Session MESA-5-1
Disturbance Rejection Control
Palos Verdes A 10:50am - 12:10pm

Session Organizer: **Mingwei Sun**, *Nankai University, Tianjin, China*
Session Co-Organizer: **Jin Tao**, *Aalto University, Espoo, Finland*

10:50am   On External Disturbance Rejection of Linear ADRC
Technical Paper Publication. IDE-TC2019-97831

Huiyu Jin, *Xiamen University, Xiamen, Fujian Province, China*, **Yang Chen, Weiyao Lan**, *Xiamen University, Xiamen, China*

11:30am   Frequency Response Analysis of Macro-micro Stages with Active Disturbance Reject Controller
Technical Paper Publication. IDE-TC2019-98352

Danping Zeng, Ruirui Huang, *Guangdong University of Technology, Guangzhou, Guangdong, China*, **Zhijun Yang**, *Guangdong Provincial Key Laboratory of Micro-Nano Manufacturing Technology and Equipment, Guangzhou, China*, **Wenchao Xue**, *Amss,Chinese Academy of Sciences, Beijing, Beijing*

MESA-1

ARTIFICIAL INTELLIGENCE AND EMERGING TECHNOLOGIES FOR MECHATRONICS AND EMBEDDED SYSTEMS
Session MESA-1-1
Artificial Intelligence and Emerging Technologies for Mechatronics and Embedded Systems
San Clemente   4:10pm - 5:50pm

Session Organizer: **Ching-Yuan Chang**, *National Taipei University of Technology, Taipei, Taiwan*
Session Co-Organizer: **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

4:10pm   Embedded RIOTS - Model Predictive Control Towards Edge
Technical Paper Publication. IDE-TC2019-97046

Jairo Viola, Sina Dehghan, YangQuan Chen, *Univ of California Merced, Merced, CA, United States*

4:30pm   CONTACTLESS LI-ION BATTERY VOLTAGE DETECTION BY USING WALABOT AND MACHINE LEARNING
Technical Paper Publication. IDE-TC2019-97668

Yanan Wang, *Beijing Institute of Technology, Beijing, China*, **Haoyu Niu, Tiebiao Zhao**, *University of California, Merced, Merced, CA, United States*, **Lei Dong, Xiaozhong Liao**, *Beijing Institute of Technology, Beijing, China*, **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

4:50pm   An embedded Machine-Vision System for the Real-time Measurement of Necking Effect and Mechanical Fracture
Technical Presentation. IDETC2019-97700

Ching-Yuan Chang, Wen-Chun Tseng, Hui-En Lin, *National Taipei University of Technology, Taipei, Taiwan*

5:10pm   Augmented Microscopy for DNA Damage Quantification: a Machine Learning Tool for Environmental, Medical and Health Sciences
Technical Paper Publication.
IDETC2019-97902

Michele Bernardini, Alessandro Ferri, Lucia Migliorelli, *Università Politecnica delle Marche, Ancona, Italy*, **Sara Moccia**, *Polytechnic University of Marche, Ancona, Italy*, **Luca Romeo, Sonia Silvestri, Luca Tiano, Adriano Mancini**, *Università Politecnica delle Marche, Ancona, Italy*

5:30pm   Preventive maintenance of blanking molds by using embedded piezoelectric films and support vector machine
Technical Presentation. IDETC2019-98192

Ching-Yuan Chang, Tsung-Han Huang, Tzu-Chun Chung, *National Taipei University of Technology, Taipei, Taiwan*

MESA-11

SENSORS AND ACTUATORS
Session MESA-11-1
Sensors and Actuators
Palos Verdes A 4:10pm - 5:50pm

Session Organizer: **Ja Choon Koo**, *Sungkyunkwan University, Suwon, Korea (Republic)*

4:10pm   Design of Multi-DOF Spherical Piezoelectric Motor Using Electrode Configuration Based Actuating Units
Technical Paper Publication. IDE-TC2019-97116

Chi-Ying Lin, *National Taiwan University of Science and Technology, Taipei, Taipei, Taiwan*, **Yu-Ting Sung**, *Compal Electronics, Inc., Taipei, Taiwan*, **Yu-Hsi Huang**, *National Taiwan University, Taipei, Taiwan*

4:30pm   Design of Acceleration Observers to Compensate for Low-Frequency Response of Piezoelectric Accelerometers
Technical Presentation. IDETC2019-97852

Yu-Sheng Lu, Po-Chen Lee, *National Taiwan Normal University, Taipei, Taiwan*

4:50pm   ENERGY OPTIMAL CONTROL OF DIELECTRIC ELASTOMER ACTUATORS VIA ADAPTIVE DYNAMIC PROGRAMMING
Technical Paper Publication. IDE-TC2019-98156

Paolo Roberto Massenio, *Polytechnic University of Bari, Bari, Bari, Italy*, **Gianluca Rizzello**, *Department of Engineering and Department of Material Science and Engineering, Saarland University, Saarbrucken, Germany*, **David Naso**, *Department of Electrical and Information Engineering, Polytechnic University of Bari, Bari, Italy*

5:10pm   Development of an Assist-as-need Controller for an Upper-limb Exoskeleton with Voluntary Torque Estimate
Technical Paper Publication. IDE-TC2019-98297

Logan Chatfield, Benjamin Fortune, Lachlan McKenzie, Chris Pretty, *University of Canterbury, Christchurch, Canterbury, New Zealand*

5:30pm   **Electrode-Skin Impedance Component Estimation in the Time-Domain Technical Paper Publication.** IDE-TC2019-98298

Benjamin Fortune, Lachlan McKenzie, Logan Chatfield, Chris Pretty, University of Canterbury, Christchurch, Canterbury, New Zealand

TUESDAY, AUGUST, 20

MESA-13
MICRO-/NANO-MANIPULATION TECHNOLOGIES AND APPLICATIONS
Session MESA-13-1
Micro-/Nano-Manipulation Technologies and Applications
San Clemente   8:00am - 9:00am

Session Organizer: **Peng Yan**, *Shandong University, Jinan, Shandong, China*
Session Co-Organizer: **Zhen Zhang**, *Tsinghua University, Beijing, China*

8:00am   **Tracking Performance Improvement of Repetitive Controller for Nano-Manipulating Systems with Time Delay Technical Paper Publication.** IDE-TC2019-97313

Pengbo Liu, Qilu University of Technology, Jinan, China, *Peng Yan*, Shandong University, Jinan, Shandong

8:30am   **Development of a Compact and Cost Effective MSL System based on a Compliant Nanomanipulator Technical Paper Publication.** IDE-TC2019-97522

Zheng Liu, Zhen Zhang, Tsinghua University, Beijing, China, *Yingchun Guan*, Beihang University, Beijing, China

MESA-15
UNMANNED VEHICLE TECHNOLOGIES AND APPLICATIONS
Session MESA-15-1
Control and optimization techniques
Palos Verdes A   8:00am - 9:00am

Session Organizer: **Wencen Wu**, *San Jose State Univ, San Jose, CA, United States*
Session Co-Organizer: **Youmin Zhang**, *Mechanical & Industrial Eng, Concordia Univ., Montreal, QC, Canada*, **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

8:00am   **Neighborhood Optimization Method For Shaping Bode Plot With Larger Phase Margin Technical Paper Publication.** IDE-TC2019-97288

Bo Shang, Chengdong Wu, Northeastern University, Shenyang, Liaoning, China, *YangQuan Chen*, Univ of California Merced, Merced, CA, United States

8:20am   **MULTI-RESOLUTION ENERGY STRAGETY FOR BATTERY MANAGEMENT SYSTEM OF UNMANNED GROUND VEHICLES IN AGRICULTURE Technical Paper Publication.** IDE-TC2019-97666

Yanan Wang, Beijing Institute of Technology, Beijing, China, *Junwei Tian*, Xi?an Technological University, Xi?an, China, *Haoyu Niu*, University of California, Merced, Merced, CA, United States, *Peng Wang*, Nanjing Forest Univ, China, Nanjing, China, *Xiaozhong Liao*, Beijing Institute of Technology, Beijing, China, *YangQuan Chen*, Univ of California Merced, Merced, CA, United States

8:40am   **A Modular Approach to Level Curve Tracking Using Two Nonholonomic Mobile Robots Technical Paper Publication.** IDE-TC2019-97665

Sarthak Chatterjee, Rensselaer Polytechnic Institu, Troy, NY, United States, *Wencen Wu*, San Jose State Univ, San Jose, CA, United States

MESA-7
EMBEDDED SYSTEMS INFRASTRUCTURE AND THEORY
Session MESA-7-1
Embedded Systems Infrastructure and Theory
San Clemente   9:10am - 10:30am

Session Organizer: **Peter Rössler**, *University of Applied Sciences Technikum Wien, Vienna, Vienna, Austria*

9:10am   **A CLOUD-BASED HEALTHCARE INFRASTRUCTURE FOR NEONATAL INTENSIVE-CARE UNITS Technical Paper Publication.** IDETC2019-97526

Lucia Migliorelli, Annalisa Cenci, Michele Bernardini, Luca Romeo, Sara Moccia, Primo Zingaretti, Università Politecnica delle Marche, Ancona, Italy

9:50am   **CHECKING APPLICATION LEVEL PROPERTIES USING ASSERTION SYNTHESIS Technical Paper Publication.** IDE-TC2019-97950

Matthias Wenzl, UAS Technikum Wien, Vienna, Austria, *Peter Rössler*, University of Applied Sciences Technikum Wien, Vienna, Vienna, Austria, *Andreas Puhm*, UAS Technikum Wien, 1200, Austria

MESA-8
EMBEDDED VISION AND AMBIENT INTELLIGENCE
Session MESA-8-1
Embedded Vision and Ambient Intelligence
       9:10am - 10:30am

Session Organizer: **Marina Paolanti**, *Università Politecnica delle Marche, Ancona, Italy*

9:10am   **Analysis Of Octree Coding For 3D Point Cloud Frame Technical Paper Publication.** IDE-TC2019-97328

Pei-Heng Li, Juo-Wei Lin, Yi-Lun Huang, Ting-Lan Lin, National Taipei University of Technology, Taipei, Select State/Province, Taiwan

MESA-15
UNMANNED VEHICLE TECHNOLOGIES AND APPLICATIONS
Session MESA-15-2
Application techniques
Palos Verdes A 9:10am - 10:30am

Session Organizer: **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*
Session Co-Organizer: **Wencen Wu**, *San Jose State Univ, San Jose, CA, United States*, **Youmin Zhang**, *Mechanical & Industrial Eng, Concordia Univ., Montreal, QC, Canada*

9:10am   Fire Detection Using Both Infrared and Visual Images with Application to Unmanned Aerial Vehicle Forest Fire Surveillance
Technical Paper Publication. IDE-TC2019-97895

Youmin Zhang, Mechanical & Industrial Eng, Concordia Univ., Montreal, QC, Canada, **Chi Yuan, Zhixiang Liu, Anim Hossain**, *Concordia University, Montreal, QC, Canada*

9:30am   PILOT-INDUCED-OSCILLA-TIONS ISSUE IN UNMANNED VEHICLES
Technical Paper Publication. IDE-TC2019-97939

Jie Yuan, Southeast Univ, Nanjing, China, **Zhenlong Wu**, *Tsinghua University, Beijing, China*, **Shumin Fei**, *Southeast Univ, Nanjing, China*, **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

9:50am   Smart and autonomous farm field scouting service robot as an edge device under $1000: Challenges and Opportunities
Technical Paper Publication. IDE-TC2019-98259

Junwei Tian, Xi?an Technological University, Xi?an, China, **Haoyu Niu**, *University of California, Merced, Merced, CA, United States*, **Peng Wang**, *Nanjing Forest Univ, China, Nanjing, China*, **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

10:10am   Smart agricultural in-field service robot: from toy to tool
Technical Paper Publication. IDE-TC2019-97497

PENG WANG, Nanjing Forestry University, Merced, CA, United States, **Junwei Tian**, *Xi?an Technological University, Xi?an, China*, **Haoyu Niu**, *University of California, Merced, Merced, CA, United States*, **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

MESA-10
MESA/CIE JOINT SYMPOSIUM: SMART CYBER-PHYSICAL SYSTEMS
Session MESA-10-1
Smart Cyber-Physical Systems
Palos Verdes A 10:50am - 12:10pm

Session Organizer: **Po Ting Lin**, *National Taiwan University of Science and Technology, Taipei, Taiwan*
Session Co-Organizer: **Imre Horvath**, *Delft Univ of Technology, Delft 2628 CE, Netherlands*, **Douglas L. Van Bossuyt**, *Naval Postgraduate School, Monterey, CA, United States*, **Yan Wang**, *Georgia Institute of Technology, Atlanta, GA, United States*, **Ting-Lan Lin**, *National Taipei University of Technology, Taipei, Taiwan*

10:50am   Study Of Industry 4.0 And Its Impact On Lean Transformation In Aerospace Manufacturing
Technical Paper Publication. IDE-TC2019-98147

Sagil James, Alejandro Cervantes, California State University Fullerton, Fullerton, CA, United States

11:30am   Data Analysis of Streaming Multivariate Time Series Data for Predictive Maintenance
Technical Presentation. IDETC2019-97856

Chao-Lung Yang, Chin-Hsuan Liang, National Taiwan University of Science and Technology, Taipei, Taipei, Taiwan

MESA-12
MECHATRONICS AND EMBEDDED SYSTEMS EDUCATION
Session MESA-12-1
Mechatronics and Embedded Systems Education
**   10:50am - 12:10pm**

Session Organizer: **Binsen Qian**, *University of California At Davis, Davis, CA, United States*

10:50am   LOW-COST REAL-TIME VISION PLATFORM FOR SPATIAL TEMPERATURE CONTROL RESEARCH EDUCATION DEVELOPMENTS
Technical Paper Publication. IDE-TC2019-97664

Jairo Viola, Univ of California Merced, Merced, CA, United States, **Alberto Radici**, *University of California, Merced, MERCED, CA, United States*, **Sina Dehghan, YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*

11:30am   EXTENDING EDUCATIONAL ROBOT SENSING CAPABILITIES THROUGH EQUIPPING AN EXTERNAL MICROCONTROLLER
Technical Paper Publication. IDE-TC2019-98470

Binsen Qian, University of California At Davis, Davis, CA, United States, **Harry Cheng**, *University of California, Davis, Davis, CA, United States*

MESA-14
FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS
Session MESA-14-3
Applications of fractional calculus in optimizing the way to optimize
San Clemente   10:50am - 12:10pm

Session Organizer: **YangQuan Chen**, *Univ of California Merced, Merced, CA, United States*
Session Co-Organizer: **Yuquan Chen**, *University of Science and Technology of China, Hefei, China*

10:50am ON THE UNIFIED DESIGN OF ACCELERATED GRADIENT DESCENT
Technical Paper Publication. IDE-TC2019-97624

Yuquan Chen, Yiheng Wei, Yong Wang, University of Science and Technology of China, Hefei, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

11:10am Fractional-order extreme learning machine with Mittag-Leffler distribution
Technical Paper Publication. IDE-TC2019-97652

Haoyu Niu, University of California, Merced, Merced, CA, United States, **Yuquan Chen**, University of Science and Technology of China, Hefei, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

11:30am IMPROVING CUCKOO SEARCH ALGORITHM WITH MITTAG-LEFFLER DISTRIBUTION
Technical Paper Publication. IDE-TC2019-97709

Jiamin Wei, Beijing Jiaotong Univ, Beijing, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States, **Yongguang Yu**, Beijing Jiaotong Univ, Beijing, China, **Yuquan Chen**, University of Science and Technology of China, Hefei, China

11:50am ONLINE IDENTIFICATION OF UNCERTAIN FRACTIONAL-ORDER NONLINEAR SYSTEMS USING A REINFORCED DIFFERENTIAL EVOLUTION OPTIMIZER
Technical Paper Publication. IDE-TC2019-98254

Jiamin Wei, Yongguang Yu, Beijing Jiaotong Univ, Beijing, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

MESA-3
ROBOTICS AND MOBILE MACHINES
Session MESA-3-1
Robotics and Mobile Machines
Palos Verdes A 2:10pm - 3:50pm

Session Organizer: **Massimo Callegari**, Polytechnic University of Marche, Ancona, OO, Italy

2:10pm Affine ICP for Fine Localization of Smart-AGVs in Smart Factories
Technical Paper Publication. IDE-TC2019-97418

Abdurrahman Yilmaz, Hakan Temeltas, Istanbul Technical University, Istanbul, Turkey

2:30pm Indoor Testbed For Vector Field Multirobot Adaptive Navigation: Feasibility Study
Technical Paper Publication. IDE-TC2019-97974

Danop Rajabhandharaks, Robert McDonald, Santa Clara University, Santa Clara, CA, United States, **Michael Neumann**, Santa Clara University, Oakland, CA, United States, **Christopher Kitts**, Santa Clara University, Burlingame, CA, United States

2:50pm Object Detection and Localization of Autonomous Humanoid Robot in Soccer Games
Technical Presentation. IDETC2019-98489

Chung-Hsien Kuo, Ken-Fun Lin, Yu-Cheng Kuo, National Taiwan University of Science and Technology, Taipei, Taiwan

3:10pm MECHANICAL DESIGN AND PROTOTYPE OF A RECONFIGURABLE ACTUATED UNIVERSAL JOINT
Technical Paper Publication. IDETC2019-97916

Matteo C. Palpacelli, Luca Carbonari, Giacomo Palmieri, Massimo Callegari, Polytechnic University of Marche, Ancona, Italy

3:30pm Dual-Arm Manipulators Kinematic Control Under Multiple Constraints via Virtual Joints Approach
Technical Paper Publication. IDETC2019-98048

Daniele Proietti Pagnotta, Alessandro Freddi, Sauro Longhi, Università Politecnica delle Marche, Ancona, Italy, **Andrea Monteriù**, Università Politecnica Delle Marche, Ancona, Italy

MESA-14
FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS
Session MESA-14-1
Theoretical developments in FDTA
San Clemente 2:10pm - 3:50pm

Session Organizer: **Yiheng Wei**, University of Science and Technology of China, Hefei, China
Session Co-Organizer: **Riccardo Caponetto**, University of Catania, Catania, CT, Italy, **chunna zhao**, Yunnan University, Kunming, China

2:10pm Formalization of Fractional Flow Component in Higher-order Logic Theorem Proving
Technical Paper Publication. IDE-TC2019-97209

chunna zhao, Mu R. Jiang, Ya Q. Huang, Yunnan University, Kunming, China

2:30pm Some Fundamental Properties on the Sampling Free Nabla Laplace Transform
Technical Paper Publication. IDE-TC2019-97351

Yiheng Wei, Yuquan Chen, Yong Wang, University of Science and Technology of China, Hefei, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

2:50pm Renormalization Group Method for Singular Perturbed Systems Driven by Fractional Brownian Motion
Technical Paper Publication. IDE-TC2019-98258

Lihong Guo, Shaoyun Shi, Jilin University, Changchun, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

3:10pm PERIODIC-DOUBLING BIFURCATION OF A CIRCUIT WITH A FRACTIONAL-ORDER MEMRISTOR
Technical Paper Publication. IDE-TC2019-98178

Yajuan Yu, Changzhou University, Changzhou, Jiangsu, China, **YangQuan Chen**, Univ of California Merced, Merced, CA, United States

3:30pm Improvement of admissibility of linear singular fractional order systems
Technical Paper Publication. IDETC2019-98329

XueFeng Zhang, Northeastern University, Shenyang, China, *Zhang Yingbo*, Northeastern University, Shen yang, China

MESA-14
FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS
Session MESA-14-2
Applications of fractional calculus in controls
San Clemente 4:10pm - 5:50pm

4:10pm Model Predictive Control of General Fractional Order Systems Using a General Purpose Optimal Control Problem Solver, RIOTS
Technical Paper Publication. IDETC2019-97489

Sina Dehghan, Univ of California Merced, Merced, CA, United States, *Tiebiao Zhao*, University of California, Merced, Merced, CA, United States, *YangQuan Chen*, Univ of California Merced, Merced, CA, United States, *Taymaz Homayouni*, University of California Merced, Merced, CA, United States

4:35pm ACTUATOR RATE LIMIT EFFECTS ON PROPORTIONAL-INTEGRAL CONTROLLER FOR FIRST-ORDER PLUS TIME-DELAY SYSTEMS
Technical Paper Publication. IDETC2019-97662

Zhenlong Wu, Tsinghua University, Beijing, China, *Jie Yuan*, Southeast Univ, Nanjing, China, *Donghai Li, Yali Xue*, Tsinghua University, Beijing, China, *YangQuan Chen*, Univ of California Merced, Merced, CA, United States

5:00pm SATISFACTORY OPTIMIZATION DESIGN FOR FRACTIONAL ORDER PID CONTROLLER
Technical Paper Publication. IDETC2019-98342

TIANYU LIU, YUANJUN JIA, University of Science and Technology of China, Hefei, China, *Weidong Jin*, Southwest Jiaotong University, Chengdu, China, *Yong Wang*, University of Science and Technology of China, Hefei, China

5:25pm Chattering-free Finite-time Stability of A Class of Fractional-order Nonlinear Systems
Technical Paper Publication. IDETC2019-97674

Bin Wang, Northwest A&F University, Yangling, China, *YangQuan Chen*, Univ of California Merced, Merced, CA, United States, *Ying Yang*, Northwest A&F University, Yangling, China

MESA-17
MECHATRONICS AND EMBEDDED TECHNOLOGIES IN INTELLIGENT TRANSPORTATION SYSTEMS
Session MESA-17-1
Mechatronics and Embedded Technologies in Intelligent Transportation Systems
Palos Verdes A 4:10pm - 5:50pm

Session Organizer: **Primo Zingaretti**, Università Politecnica delle Marche, Ancona, Italy

4:10pm Research On An Intelligent Diagnostic Equipment Suitable For Rail Traffic Braking System
Technical Paper Publication. IDETC2019-97600

Changzheng Fang, CRRC Zhuzhou Locmotive Co,.LTD, Zhuzhou, China, *Jing Yang, Quan Liu*, CRRC Zhuzhou Locomotive Co.,Ltd, Zhuzhou, China, *Furen Feng*, Tongji University, Shanghai, China, *Jianyong Zuo*, Tongji Univ., Shanghai, China

4:30pm Model-Based Combustion Duration and Ignition Timing Prediction for Combustion Phasing Control of A Spark-Ignition Engine Using In-Cylinder Pressure Sensors
Technical Paper Publication. IDETC2019-97703

Xin Wang, Amir Khameneian, Paul Dice, Bo Chen, Mahdi Shahbakhti, Jeffrey Naber, Michigan Technological University, Houghton, MI, United States, *Chad Archer, Qiuping Qu, Chris Glugla, Garlan Huberts*, Ford Motor Company, Dearborn, MI, United States

4:50pm MPC-BASED CONTROL OF AUTONOMOUS VEHICLES WITH LOCALIZED PATH PLANNING FOR OBSTACLE AVOIDANCE UNDER UNCERTAINTIES
Technical Paper Publication. IDETC2019-97712

Sai Rajeev Devaragudi, Bo Chen, Michigan Technological University, Houghton, MI, United States

5:10pm A Cloud Computing Architecture to Map Trawling Activities using Positioning Data
Technical Paper Publication. IDETC2019-97779

Alessandro Galdelli, Adriano Mancini, Università Politecnica delle Marche, Ancona, AN, Italy, *Anna N. Tassetti, Carmen Ferrà Vega, Enrico Armelloni, Giuseppe Scarcella, Gianna Fabi*, Institute of Marine Biological Resources and Biotechnologies - National Research Council, Ancona, AN, Italy, *Primo Zingaretti*, Università Politecnica delle Marche, Ancona, Italy

5:30pm MODEL ORDER REDUCTION VIA NON INTEGER ORDER SYSTEMS
Technical Presentation. IDETC2019-98349

Riccardo Caponetto, Emanuele Murgano, University of Catania, Catania, Italy