



**Northeastern
University**

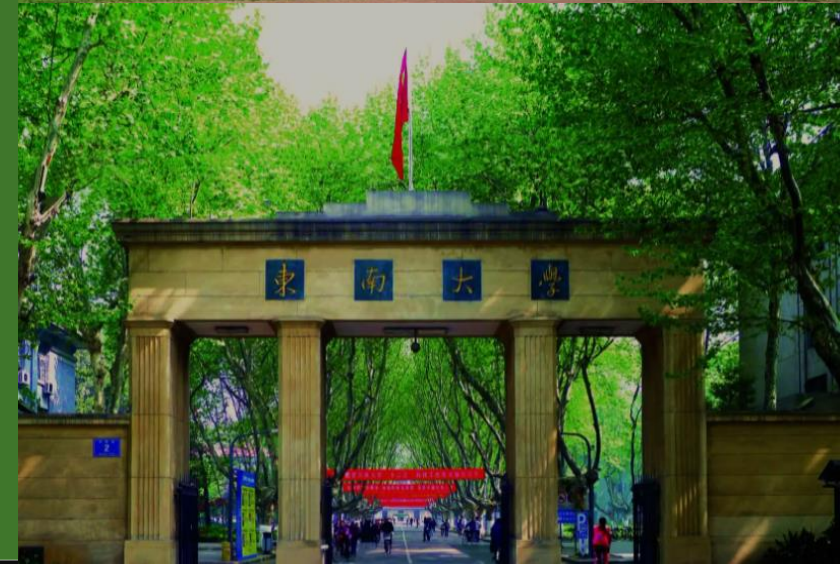


**Southeast
University**

M2VIP₂₀₂₂

**The 2022 28th IEEE International Conference
on Mechatronics and Machine Vision in
Practice (M2VIP 2022)**

November 16-18, 2022 (EST, USA)



The M2VIP 2022 conference will be a virtual experience due to the continuing impact and future unpredictability of the COVID-19 pandemic. This decision was not easily made, but the safety and well-being of our participants are our utmost priorities. Our goal remains to provide a conference of the highest quality. And we aim to take full advantage of the virtual platform to enhance inclusivity that allows the exchange of our community's latest research and ideas.

Organizing Committee

Steering Committee Chairs

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John Billingsley, University of Southern Queensland, Australia

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Haiying Wen, Southeast University, China

General Chairs

Yingzi Lin

Northeastern University, USA

Zhisheng Zhang

Southeast University, China

Welcome



Prof. Yingzi Lin
M2VIP 2022 General Chair
Intelligent Human-Machine Systems Lab
Department of Mechanical and Industrial Engineering
Northeastern University
Boston, MA, USA



Prof. Zhisheng Zhang
M2VIP 2022 General Chair
School of Mechanical Engineering
Southeast University
Nanjing, China

On behalf of the organizing committee, we would like to welcome guests and friends from all over the world to participate in the 28th International Conference on Mechatronics and Machine Vision Practice (M2VIP) in 2022.

We believe that the first task of M2VIP organizers is to ensure the personal safety of participants and to perform high-quality events with less risk, but due to the ongoing impact of the COVID-19 virus and the unpredictability of the future, the organizing committee has decided to adjust the M2VIP 2022 conference to a virtual

event. The content of this online conference includes keynote speeches, papers and oral presentations. For the details, please refer to the conference program published at the conference website.

Last but not least, our heartfelt thanks to everyone who has made M2VIP 2022 possible. We especially appreciate the efforts of the conference committee members, paper reviewers and conference volunteers.

Welcome to M2VIP 2022! Looking forward to meeting you online!

M2VIP₂₀₂₂

**2022 28th IEEE International Conference
on Mechatronics and Machine Vision in Practice**

Conference Program

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Program at a Glance

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Paper Presentation Schedule

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Keynote Speeches

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Program at a Glance

November 16, 2022 (EST, USA)

EST/US: 07:00 PM-07:15 PM
(Beijing: 08:00 AM-08:15 AM)

Opening Ceremony (Zoom A: 973 8213 7256)

Welcome Speech by General Chair: Yingzi Lin
M2VIP2023 Announcement

EST/US: 07:15 PM-08:15 PM
(Beijing: 08:15 AM-09:15 AM)

Keynote Speech +QA (Zoom A: 973 8213 7256)

Keynote speaker: Prof. Masayoshi Tomizuka
(Chaired by Prof. Yingzi Lin)

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

(Break)

EST/US: 08:30 PM-10:15 PM
(Beijing: 09:30 AM-11:15 AM)

Best paper finalists (Zoom A\B)

Zoom A: 973 8213 7256
Best Paper 1,

Zoom B: 827 3307 5370
Best Paper 2

Program at a Glance

November 17, 2022 (EST, USA)

EST/US: 07:00 PM-08:00 PM
(Beijing: 08:00 AM-09:00 AM)

Keynote Speech (Zoom A: 951 9142 1019)

Keynote speaker: Prof. Subhas Mukhopadhyay
(Chaired by Prof. Peter Xu)

EST/US: 08:00 PM-09:15 PM
(Beijing: 09:00 AM-10:15 AM)

Regular Session (Zoom A\B\C)

Zoom A: 951 9142 1019
Machine vision 1,

Zoom B: 812 5322 6947
Soft robotics,

Zoom C: 971 2571 9825
Sensor&Actuator 1

EST/US: 09:15 PM-09:30 PM
(Beijing: 10:15 AM-10:30 AM)

(Break)

EST/US: 09:30 PM-11:30 PM
(Beijing: 10:30 AM-12:30 PM)

Regular Session (Zoom A\B\C)

Zoom A: 951 9142 1019
Machine vision 2 ,

Zoom B: 812 5322 6947
Biomechatronics ,

Zoom C: 971 2571 9825
Sensor&Actuator 2

Program at a Glance

November 18, 2022 (EST, USA)

EST/US: 07:00 PM-08:00 PM
(Beijing: 08:00 AM-09:00 AM)

Keynote Speech (Zoom A: 920 5990 8904)

Keynote speaker: Prof. Xingang Zhao
(Chaired by Prof. Zhisheng Zhang)

EST/US: 08:00 PM-09:15 PM
(Beijing: 09:00 AM-10:15 AM)

Regular Session (Zoom A\B\C)

Zoom A: 920 5990 8904

Zoom B: 828 9405 2882

Zoom C: 926 2341 0970

Machine learning & Deep learning 1,

Optimization & Control 1,

Human-machine interaction 1

EST/US: 09:15 PM-09:30 PM
(Beijing: 10:15 AM-10:30 AM)

(Break)

EST/US: 09:30 PM-11:30 PM
(Beijing: 10:30 AM-12:30 PM)

Regular Session (Zoom A\B\C)

Zoom A: 920 5990 8904

Zoom B: 828 9405 2882

Zoom C: 926 2341 0970

Machine learning & Deep learning 2,

Optimization & Control 2,

Human-machine interaction 2

Online Meeting Arrangement

Virtual Zoom	November 16	November 17	November 18
(Keynote)			
Zoom A	973 8213 7256	951 9142 1019	920 5990 8904
Zoom B	827 3307 5370	812 5322 6947	828 9405 2882
Zoom C		971 2571 9825	926 2341 0970

Paper Presentation Schedule

Nov 16 (EST, USA), Best Paper Finalists (Zoom A: 973 8213 7256, Session Chair: Mengying Xie, Yuan Chao)

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Jiangbei Wang, Yuxuan Wang and Yanqiong Fei
A High-Torque Bidirectional Curl Pneumatic Artificial Muscle

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Yu Lu, Zhisheng Zhang, Haiying Wen and Min Dai
RGB-D SLAM Using Scene Flow in Dynamic Environments

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Haoran Zheng, Shanghai Wei, Wei Yu and Brent Young
Multi-Label Classification for Metal Defects from SEM Images Using Deep Learning

EST/US: 09:15 PM-09:30 PM
(Beijing: 10:15 AM-10:30 AM)

Mengying Xie
Spiral Resonator-Based Corneal Contact Lens for Intraocular Pressure Monitoring

Paper Presentation Schedule

Nov 16 (EST, USA), Best Paper Finalists (Zoom A: 973 8213 7256, Session Chair: Mengying Xie, Yuan Chao)

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Danyang Qu; Yiwen Zhao; Xingang Zhao; Guoli Song
Recursive Parallelotope Set-Membership Estimation Algorithm in
Nonlinear System

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Jingyu Zhang, Jie Chen, Yu Dang and Jianda Han
Design and Analysis of a Yoshimura Continuum Actuator

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Leon Ripa and Khalid M arif
Orchard Yield Estimation Using Multi-Angle Image Processing

Paper Presentation Schedule

Nov 16 (EST, USA), Best Paper Finalists (Zoom B: 827 3307 5370, Session Chair: Mingzhu Zhu, Wenchao Zhu)

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Chengxia Ma; Yuan Chao; Junjie Zhu; Yaqian Wang; Wenhui Liu;
Zhenhua Han
Chip Surface Defect Recognition Based on Improved Faster R-CNN

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Mengyu Dou; Zhonghua Guo; Minghu Wei
Airflow Sensing, Pre-Bending Soft Pneumatic Gripper and Its
Characterization

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Yijie Guo; Haiying Wen; Zijun Su; Benzhen Zhu; Zhisheng Zhang;
Zhijie Xia
Design of Elastic Joints for a Bionic Parallel Chewing Robot

EST/US: 09:15 PM-09:30 PM
(Beijing: 10:15 AM-10:30 AM)

Chunxing Yang; Quan Liu; Kun Chen; Li Ma; Qingsong Ai
Deep Residual Shrinkage Networks for Adaptive Classification of EEG
Error-Related Potentials

Paper Presentation Schedule

Nov 16 (EST, USA), Best Paper Finalists (Zoom B: 827 3307 5370, Session Chair: Mingzhu Zhu, Wenchao Zhu)

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Matthew Adrian Swanepoel; Glen Bright; Ingrid R Botha
Optimized Two-Axis Inertial Stabilization Platform Design for
Unmanned Aerial Vehicle Integration

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Erik-Felix Tinsel and Oliver H. Riedel
A Virtual Assistant System for the Requirements Elicitation and Initial
Simulation Model Variant Generation of Modular Industrial Plants

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Zhu Wenchao; Arthur F. Kramer; Yingzi Lin
Multimodal Physiological Assessment to the Task-Related Attention
States in a VR Driving Environment

Machine Vision 1

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Keyur D. Joshi; Dhruv Shah; Varshil Shah; Nilay Gandhi; Sanket Shah
Machine Vision Using Cellphone Camera: A Comparison of Deep Networks for Classifying Three Challenging Denominations of Indian Coins

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

Siddharth Agrawal; Keyur D. Joshi
Indian Commercial Truck License Plate Detection and Recognition for Weighbridge Automation

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Jian Cheng; Bo Sheng; Jing Tao; Yuanhang Wang
Marker-Less Motion Capture Technology Based on Binocular Stereo Vision and Deep Learning

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Priyam Parikh; Keyur D. Joshi; Reena Trivedi
Face Detection-Based Depth Estimation by 2D and 3D Cameras: A Comparison

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Jean-Henri Odendaal; Nitin Bhatia; Russell Wilson and Johan Potgieter;
Exploring Non-Destructive Mechanical Characterisation of Hydrogels Using Hyperspectral Imaging and Machine Vision

Nov 17 (EST, USA), Regular Session (Zoom A: 951 9142 1019, Session Chair: Kai Chen, Dong Liu)

Machine Vision 2

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Kai Chen
Arithmetic Optimization Algorithm to Optimize Support Vector
Machine for Chip Defect Identification

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Muhammad Nabeel Tahir; Zubair Khalid; Adeem Aslam
Online, Real-Time and Robust Detection and Localization of Foreign
Objects on Paper Surface Using Machine Vision and Clustering

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Yu Wen
Surface Defect Detection of Cable Based on Improved YOLO V3

EST/US: 10:15 PM-10:30 PM
(Beijing: 11:15 AM-11:30 AM)

Jiang Xin; Zhisheng Zhang; Qiang Wang; Peng Meng; Min Dai; Haiying Wen
Visual Inspection System for CNC Turning Tool Wear Based on Transfer
Learning

Machine Vision 2

EST/US: 10:30 PM-10:45 PM
(Beijing: 11:30 AM-11:45 AM)

Yuhang Li, Yafei Wang, Ruitao Zhang, Zexing Li and Xinchang Wang
Projection Distance-Based Dynamic Objects Removal for 3D Point Cloud Map Construction

EST/US: 10:45 PM-11:00 PM
(Beijing: 11:45 AM-12:00 PM)

Peng Meng; Zhang Hui; Haiying Wen, Min Dai; Zhisheng Zhang; Guifu Zhang
Design of Real-Time Image Processing System of Medical High-Definition Electronic Endoscope Based on FPGA

EST/US: 11:00 PM-11:15 PM
(Beijing: 12:00 PM-12:15 PM)

Chen Li
Research on Quality Improvement of Bullet Assembly Based on Image Processing

Nov 17 (EST, USA), Regular Session (Zoom B: 812 5322 6947, Session Chair: Hui Zhang)

Soft robotics

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Lijun Hao; Tangwen Yang
Bending Actuation of Ferromagnetic Soft Continuum Robot Under Spatially Non-Uniform Magnetic Fields

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

Minghao Wang; Yu Du; Xiaojing Tian; Dong Liu; Ming Cong
Extensible Bidirectional Bending Soft Robot for Hand Functional Rehabilitation Training

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Bangxiang Chen; Peter Xu; Jaspreet Dhupia
Deformation and Dynamic Response of a Soft Cavity Facilitating Robotic Chewing of Foods

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Zhen Luo; Jisen Li; Xu Zhipeng; Jian Zhu
Performance of Actuators for Facial Robot: A Comparison Study Between Electric Motor and Dielectric Elastomer Actuator

Nov 17 (EST, USA), Regular Session (Zoom B: 812 5322 6947, Session Chair: Kunkun Zhao, Min Dai)

Biomechatronics

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Kunkun Zhao; Zhisheng Zhang
Muscle Synergies Patterns in Post-Stroke Patients

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Annika M. Kienzlen; Florian Jaensch; Alexander Verl; Leo Cheng
Concept for a Reinforcement Learning Approach to Navigate Catheters
Through Blood Vessels

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Kaiyu Wang; Chibin Zhang
The Biological Vesicle Elastohydrodynamic Model of Deformation of
Red Blood Cells in Permeable Microvessels

EST/US: 10:15 PM-10:30 PM
(Beijing: 11:15 AM-11:30 AM)

Ming Han; Guangchao Xie; Yu Dang; Xuejun Zhang; Jianda Han;
Preliminary Assessment of Blood Effect on the Raman Spectra of Breast
Tumor Tissue

Nov 17 (EST, USA), Regular Session (Zoom C: 971 2571 9825, Session Chair: Xudong Wang)

Sensor & Actuator 1

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Xudong Wang; Peter Xu; Jaspreet Dhupia; John Bronlund
New Concept and Challenges of a Next-Generation Chewing Robot

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

Jean-Henri Odendaal; Marie Joo Le Guen; Olaf Diegel; Nitin Bhatia;
Russell Wilson; Johan Potgieter
3D Printing Using Steerable Needles

EST/US: 08:30 PM-08:45 PM
(Beijing: 11:00 AM-11:15 AM)

Pan Liu; Yaming Wan
Analysis and Research on the Workspace of the Ejection Mechanism

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Rongfeng Zhang; Di Fu; Gang Chen; Linjie Dong; Xingsong Wang;
Mengqian Tian
Research on UWB-Based Data Fusion Positioning Method

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Chen Deng; Chibin Zhang
The Design of Tennis Training Platform Based on the Service Robot

Sensor & Actuator 2

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Xiangyang Zhang; Wenyu Wu; Jiayu Guo; Yingliang Sun; Yilian Li;
Mingrui Li
Collaborative Hand-Eye Virtual Interaction Visualization Method
and Technologies

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Jin Li
Study on Acoustic-Elastic Effect in Aramid Fiber Reinforced Epoxy
Composites for High Voltage Insulation Pull Rod

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Guifu Zhang; Zhisheng Zhang, Zhijie Xia, Min Dai and Peng Meng
Implementation and Research on Indoor Mobile Robot Mapping
and Navigation Based on RTAB-Map

Machine learning & Deep learning 1

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Ji Li and Ming Huang
Study on the Reliability of SemGCN in Gait Analysis

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

David I Wilson, Shahil Khan, Martin Stommel and Steven Pan; Zhipeng Zhang; Aiden Kim
Comparing Machine Learning Strategies for Industrial Struvite Production

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Dayu Guan, Yan Lu and Chungang Zhuang
Recognition of Micro Force Locking Contact State Based on One-Dimensional Residual Network

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Jianan Zheng; Yingzi Lin
An Objective Pain Measurement Machine Learning Model through Facial Expressions and Physiological Signals

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Hongtao Ma and Zhisheng Zhang; Junai Zhao
Feature Extraction with Locally Preserving Projections Based on Fuzzy K- Neighbor

Nov 18(EST, USA), Regular Session (Zoom A: 920 5990 8904, Session Chair: Yiming Guo)

Machine learning & Deep learning 2

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Yiming Guo; Xiaoyu Wang and Zhisheng Zhang
Fault Diagnosis of Imbalanced Multi-Channel Data Based on Deep Transfer Learning

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Baolin Li; Wenke Gao; Wei Zhang; Zhicheng Dong
Remaining Useful Life Prediction of Rolling Bearing Based on Ensemble Learning

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Zijun Su; Min Wu; Zhisheng Zhang, Haiying Wen, Zhijie Xia and Hongzhang Zheng
Detection and State Classification of Bolts Based on Faster R-CNN

EST/US: 10:15 PM-10:30 PM
(Beijing: 11:15 AM-11:30 AM)

Jin Tao
Spare Parts Inventory Optimization Using Multi-Agent Hierarchical Reinforcement Learning

Optimization & Control 1

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Priyam Parikh; Reena Trivedi; Keyur D. Joshi
Continuous Trajectory Planning of a 6 DoF Feeding Robotic Arm Using
Novel Multi-Point LSPB Algorithm

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

Shahab Kazemi; Martin Stommel ; Leo Cheng; Peter Xu
Optimal Feedback Linearization Control for a Bioinspired Soft
Pneumatic Contractive Actuator

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Mahmoud Zarebidoki, Jaspreet Dhupia and Peter Xu
Robust Inverse Dynamics Control of a Cable-Driven Underwater
Manipulator with Elastic Cables

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Juan Huang and Saijun Zhang
A Kinematic Method for Workpiece Transfer in Virtual Commissioning

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Liu Lingyan, Wang Jie, Wu Jiyuan, Linjie Dong, Xingsong Wang and
Mengqian Tian
Lower Limb-Assisted Exoskeleton to Support Walking Up and down
Stairs

Nov 18(EST, USA), Regular Session (Zoom B: 828 9405 2882, Session Chair: Yunde Shi, Yu Dang)

Optimization & Control 2

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Thelissa Govender; Glen Bright; Ingrid R Botha
Evaluating the Seed Sowing Performance of a UAV Supported
Pneumatic Planting System

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Ru Yi He and Bing Zhang; Bi Zhuming; WJ Zhang
Development of a Hybrid Haptic Device with a High Degree of Motion
Decoupling

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Yufan Yang, Shuwei Zhu and Fang Jia
An AGV Appearance Optimization Design Based on Humanized Design
Theory

EST/US: 10:15 PM-10:30 PM
(Beijing: 11:15 AM-11:30 AM)

Jiahao Ma and Mingzhu Zhu; Teng Zhang; Xiaokui Yue
The Wheel-Legged Robot for Granular Terrain: Guardian

Optimization & Control 2

EST/US: 10:30 PM-10:45 PM
(Beijing: 11:30 AM-11:45 AM)

Shuwei Zhu, Yufan Yang, Zhisheng Zhang, Yunde Shi, Zhijie Xia; Fang Jia
Analysis and Improvement of Non-Contact Permanent Magnet Adsorption
Unit for Ship Wall-Climbing Robot

EST/US: 10:45 PM-11:00 PM
(Beijing: 11:45 AM-12:00 PM)

Yadong Ren, Wujing Xiao, Linjie Dong, Fang Jia, Xingsong Wang and
Mengqian Tian
Design of Human-Machine Cooperative Control Algorithm for Lower
Extremity Exoskeleton

EST/US: 11:00 PM-11:15 PM
(Beijing: 12:00 PM-12:15 PM)

Haoxuan Zheng, Yanchao Zhao and Xinjun Sheng
Design of Temperature Control System of Insufflator Based on Fuzzy
and PID Algorithm

Nov 18(EST, USA), Regular Session (Zoom C: 926 2341 0970, Session Chair: Chenyue Huang)

Human-machine interaction 1

EST/US: 08:00 PM-08:15 PM
(Beijing: 09:00 AM-09:15 AM)

Chenyue Huang; Ruomei Tang; Zhisheng Zhang
Co-Design: Sustainable Innovation Power of Landscape Co-Creation in the Context of Third Class Intelligence

EST/US: 08:15 PM-08:30 PM
(Beijing: 09:15 AM-09:30 AM)

Aili Gao and Zhisheng Zhang; Wenyu Wu; Yuan Fang; Zhijie Xia
Color Matching Evaluation of Industrial Digital Twin Interface Based on Grey Fixed Weight Clustering Method

EST/US: 08:30 PM-08:45 PM
(Beijing: 09:30 AM-09:45 AM)

Yaqing Li, Xiaozhou Zhou and Chengqi Xue
Research on User Transparency Perception Based on Mixed Reality

EST/US: 08:45 PM-09:00 PM
(Beijing: 09:45 AM-10:00 AM)

Tong Wu
On the Packaging Design of Agri-Tourism Products Based on Improved AHP Method

EST/US: 09:00 PM-09:15 PM
(Beijing: 10:00 AM-10:15 AM)

Shengnan Cui
Analysis of Differentiated User Needs of Induction Cooktop Operational Interface Based on Eye-Tracking Experiment

Nov 18(EST, USA), Regular Session (Zoom C: 926 2341 0970, Session Chair: Dini Duan, Wenyu Wu)

Human-machine interaction 2

EST/US: 09:30 PM-09:45 PM
(Beijing: 10:30 AM-10:45 AM)

Dini Duan; Zhisheng Zhang; Zhijie Xia
A Study of the Impacts of Message Framing and Narrative Visualization on Sleep Behavior Intervention

EST/US: 09:45 PM-10:00 PM
(Beijing: 10:45 AM-11:00 AM)

Yuqing Zhou, Xiaozhou Zhou and Chengqi Xue
Research on the Display Area of Chinese Text Boxes in the Virtual Reality Field of View

EST/US: 10:00 PM-10:15 PM
(Beijing: 11:00 AM-11:15 AM)

Dihui Chu, Zhisheng Zhang, Wenyu Wu and Zhijie Xia; Fangzhou Dong
Evaluating the Brightness Difference of Driver's Visual Adaptation Between Road and HMI Using Consensus Model and PSO Algorithm

EST/US: 10:15 PM-10:30 PM
(Beijing: 11:15 AM-11:30 AM)

Shoupeng Li; Zhisheng Zhang; Wenyu Wu and Yuan Fang; Zhijie Xia
Cognitive Evaluation of Digital Twin Interface Layout of Industrial Machine Tools Based on Aesthetics Model

Human-machine interaction 2

EST/US: 10:30 PM-10:45 PM
(Beijing: 11:30 AM-11:45 AM)

Xinyi Ye; Wenyu Wu; Chengqi Xue
Research on Psychological Load of Drivers Based on Using On-Board
Information System from Different Angles

EST/US: 10:45 PM-11:00 PM
(Beijing: 11:45 AM-12:00 PM)

Yaxin Yang
Evaluation of Digital Twin Interface Element Layout Design Based on the
Interface Aesthetics Model

EST/US: 11:00 PM-11:15 PM
(Beijing: 12:00 PM-12:15 PM)

Yuli Wang
Exploration of Driverless Electric Vehicle Interaction Interface Design
Based on Human-Computer System

Keynote Speech: Exploration in the Forest of Mechanical Systems Control

Abstract

I have thoroughly enjoyed teaching and research in the field of mechanical systems control over the past fifty years. This field has been full of new theory, new mechanical hardware and new tools for real time control, and is nothing but the world of mechatronics. In this talk, I would like to give a brief review of how this field has developed during the past fifty years and what my personal involvements have been in this field and what my current involvements are. Overall, the talk is a chronicle of my journey of exploration with my students in the forest of mechanical systems control.

Biography



Masayoshi Tomizuka received his Ph. D. degree in Mechanical Engineering from the Massachusetts Institute of Technology in February 1974. In 1974, he joined the faculty of the Department of Mechanical Engineering at the University of California at Berkeley, where he currently holds the Cheryl and John Neerhout, Jr., Distinguished Professorship Chair and serves as Associate Dean for the Faculty in the College of Engineering. His current research interests are optimal and adaptive control, digital control, motion control, and control problems related to robotics and manufacturing, vehicles and mechatronic systems. He served as Program Director of the Dynamic Systems and Control Program of the National Science Foundation (2002-2004). He has supervised about 130 Ph. D. students to completion. He served as President of the American Automatic Control Council (AACC) (1998-99). He is Honorary Member of the ASME, Life Fellow IEEE, and Fellow of IFAC and the Society of Manufacturing Engineers (SME). He is the recipient of the J-DSMC Best Paper Award (1995, 2010), the DSCD Outstanding Investigator Award (1996), the Charles Russ Richards Memorial Award (ASME, 1997), the Rufus Oldenburger Medal (ASME, 2002), the John R. Ragazzini Award (AACC, 2006), the Richard Bellman Control Heritage Award (AACC, 2018), the Honda Medal (ASME, 2019) and the Nichols Medal (IFAC, 2020). He is a member of the National Academy of Engineering.

Keynote Speech: Recent Advances in Mechatronics and Machine Vision

Abstract

The advancement of sensing technologies, embedded systems, wireless communication technologies, nano-materials, miniaturization, vision sensing and processing speed makes it possible to develop smart mechatronics and machine systems. This seminar will discuss recent research and developmental activities at Macquarie University on Mechatronics and machine vision for home, health and environmental monitoring.

Biography



Subhas holds a B.E.E. (gold medallist), M.E.E., Ph.D. (India), and Doctor of Engineering (Japan). He has over 31 years of teaching, industrial and research experience.

Currently, he is working as a Professor of Mechanical/Electronics Engineering, Macquarie University, Australia and is the Discipline Leader of the Mechatronics Engineering Degree Programme. His fields of interest include Smart Sensors and sensing technology, instrumentation techniques, wireless sensors and network (WSN), Internet of Things (IoT), Mechatronics, etc. He has supervised over 50 postgraduate students and over 150 Honours students. He has examined over 75 postgraduate theses.

He has published over 450 papers in different international journals and conference proceedings, written ten books and fifty two book chapters, and edited eighteen conference proceedings. He has also edited thirty five books with Springer-Verlag and thirty two journal special issues. He has organized over 20 international conferences as either General chair/co-chair or Technical Programme Chair. He has delivered 404 presentations including keynote, invited tutorials, and special lectures. As per Google Scholar, his total citation is 16086 and h-index is 64.

He is a Fellow of IEEE (USA), a Fellow of IET (UK), and a Fellow of IETE (India). He is a Topical Editor of the IEEE Sensors journal. He is also an associate editor of IEEE Transactions on Instrumentation and Measurements and IEEE Reviews in Biomedical Engineering (RBME). He is a Distinguished Lecturer of the IEEE Sensors Council from 2017 to 2022. He chairs the IEEE Sensors Council NSW chapter.

Keynote Speech: Rehabilitation robot, perception, and interactive control technology

Abstract

Diseases such as stroke can lead to decreased or even loss of motor function. In order to reconstruct the impaired nerve pathway and restore the limb motor function, effective rehabilitation training is needed. Rehabilitation robot, which is suitable for long time, repetitive work, with high flexibility, precise control, and other characteristics, provides solution to deal with the situation of insufficient rehabilitation physicians. From the perspective of interaction between human and rehabilitation robot, this seminar will discuss how to improve the perception ability of rehabilitation robot, and how to improve the auxiliary performance of rehabilitation robot. Recent research about rehabilitation robot developed by Shenyang Institute of Automation will be briefly introduced.

Biography



Dr. Xingang Zhao is a Professor in the State Key Laboratory of Robotics, Shenyang Institute of Automation, Chinese Academy of Sciences (SIA). He received BE and ME degrees from Jilin University, China, in 2000 and 2004, and Ph.D. from Chinese Academy of Sciences, China in 2008. From 2008 through 2009, he was an Assistant Professor in the SIA. From 2010 through 2014, he was an Associate Professor. Since 2015, he is a full Professor in SIA. His current research interests are rehabilitation robots, which combine the robot design, modeling and control, physiological signal processing. Dr. Zhao has received grants from National Natural Sciences Foundation of China and Ministry of Science and Technology of the People's Republic of China. He has published more than 100 peer reviewed papers.