

# **2023 IEEE International Symposium on Robotic and Sensors Environments (ROSE 2023)**

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6-7 November 2023**



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## Technical Program: Monday, November 6, 2023

8:00 - 9:00

### Registration

8:15 - 8:30

### Opening Remarks

*Wail Gueaieb, (University of Ottawa, Canada) and  
Genci Capi (Hosei University, Japan)*

8:30 - 10:30

### Session: Robotics and Applications I

*Session Chair: Fahimeh Farahnakian (University of Turku)*

8:50

#### [Delivery robots are not just small autonomous cars! How to close the gap in environmental data for planning their operation?.....1](#)

Martin Plank (Technische Universität Bergakademie Freiberg, Germany)  
Georg Jäger (Technische Universität Bergakademie Freiberg, Germany)  
Sebastian Zug (Technische Universität Bergakademie Freiberg, Germany)

9:10

#### [An Autonomous Vehicle-Following Technique for Self-Driving Cars Based on the Semantic Segmentation Technique.....9](#)

Jichiang Tsai (National Chung-Hsing University, Taiwan)  
Yuan-Tsun Chang (National Chung Hsing University, Taiwan)  
Ping-Hao Chuang (National Chung Hsing University, Taiwan)  
Zhehao You (National Chung Hsing University, Taiwan)

9:30

#### [Vision-Based Yakiniku Recognition System for Autonomous Cooking Robot.....16](#)

Sivapong Nilwong (Thai-Nichi Institute of Tehnology, Thailand)  
Pimlapat Butdee (Rangsit University, Thailand)  
Goragod Pongthanisor (Hosei University, Japan)  
Genci Capi (Hosei University, Japan)

9:50

#### [uWSC Aircraft Simulator: A Gazebo-based model for uncrewed weight-shift control aircraft flight simulation.....21](#)

Nathaniel Q Mailhot (University of Ottawa, Canada)  
Teresa de Jesus Krings (Carleton University, Canada)  
Gilmar Tuta Navajas (Romaeris Corporation, Canada)  
Boyan Zhou (Carleton University, Canada)  
Davide Spinello (University of Ottawa, Canada)

10:10

#### [Experimental Validation of Multirobot Coverage using Underactuated Networked Mobile Robots.....29](#)

Md Suruz Miah (Bradley University, USA)  
Isaiah Chism (Bradley University, USA)  
Daniel Plante (Bradley University, USA)  
Mohammad Abouheaf (Bowling Green State University, USA)

10:30 – 10:50

### Coffee Break

10:50 – 12:00

### Keynote: Bridging the Medicine-Engineering Gap: Bionic Humanoids and the Future of Surgical Robotics

Kanako Harada, The University of Tokyo, School of Medicine  
*Session Chair: Wail Gueaieb (University of Ottawa, Canada) and  
Genci Capi (Hosei University, Japan)*

12:00 – 13:30

### Lunch Break

13:30 - 14:30

### Special Session: Assistive Robotics

*Session Chair: Genci Capi (Hosei University, Japan)*

13:00

#### [A global stability analysis of legged balance controllers under ZMP constraints.....36](#)

Kazuhisa Mitobe (Yamagata University, Japan)  
Genci Capi (Hosei University, Japan)

13:30

**Image Reconstruction from Visual Perception and Visual Imagery for BMI systems.....42**

Yuma Sugimoto (Hosei University, Japan)

Goragod Pongthanisorn (Hosei University, Japan)

Genci Capi (Hosei University, Japan)

14:00

**Image-based Outdoor Navigation in Static Environments via Conditional Neural Movement Primitive.....47**

Naoki Nakahara (Hosei University, Japan)

Goragod Pongthanisorn (Hosei University, Japan)

Genci Capi (Hosei University, Japan)

14:30 – 14:50

**Coffee Break**

14:50 - 17:50

**Tutorial I: Deep Learning and Signal Processing for Robot Control using Brain Signals: A Python Implementation**

*Goragod Pongthanisorn (Hosei University)*

*Sivapong Nilwong (Thai-Nichi Institute of Technology)*

*Genci Capi (Hosei University, Japan)*

*Session Chair: Genci Capi (Hosei University, Japan)*

17:50 – 18:00

**Visit to the Assistive Robotics Lab – End of Day 1**

18:30 – 20:30

**Gala Dinner**

## Technical Program: Tuesday, November 7, 2023

8:00 - 8:30

### Registration

8:30 - 9:10

### Opening Remarks

Wail Gueaieb, (University of Ottawa, Canada) and  
Genci Capi (Hosei University, Japan)

8:30 - 10:30

### Session: Sensing, Learning and Control

Session Chair: Nathaniel Mailhot (University of Ottawa, Canada)

8:30

#### **Behavior Replication of Cascaded Dynamic Systems Using Machine Learning.....52**

Mohammad Abouheaf (Bowling Green State University, USA)  
Wail Gueaieb (University of Ottawa, Canada)  
Mohamed Bin Zayed University of Artificial Intelligence, United Arab Emirates)  
Mohammad Mayyas (Professor of Robotics, USA)

8:50

#### **CNN-based Boreal Peatland Fertility Classification from Sentinel-1 and Sentinel-2 Imagery.....59**

Fahimeh Farahnakian (University of Turku, Finland)  
Luca Zelioli (University of Turku, Finland)  
Maarit Middleton (Geological Survey of Finland, Finland)  
Iiro Seppä (University of Turku, Finland)  
Timo Pitkänen (Natural Resources Institute Finland, Finland)  
Jukka Heikkonen (University of Turku, Finland)

9:10

#### **Remote Vibration Haptization System Using High-Speed Active Vision.....66**

Kotaro Fujita and Feiyue Wang (Hiroshima University, Japan)  
Kohei Shimasaki (Designated Assistant, Japan)  
Idaku Ishii (Hiroshima University, Japan)

9:30

#### **Automated Biomass Estimation through Depth Measurement with an OAK-D Camera.....72**

Zhenyu Ma, Yue Cao and Rakiba Rayhana (The University of British Columbia, Canada)  
Zheng Liu (University of British Columbia Okanagan, Canada)  
Gaozhi (George) Xiao (National Research Council Canada, Canada)  
Yuefeng Ruan (Agriculture and Agri-Food Canada, Canada)  
Jatinder S Sangha (Agriculture and Agri-Food Canada, Canada)

9:50

#### **Improving Fitting CAD to 3D Point Cloud Acquired with Line-of-Sight Sensor.....78**

Marek Franaszek (National Institute of Standards and Technology, USA)  
Prem Rachakonda (National Institute of Standards and Technology, USA)  
Kamel S. Saidi (National Institute of Standards and Technology, USA)

10:10

#### **A soft and vibration-free positioning controller for series elastic tendon-driven robots by using gyro sensor and electromagnetic brakes.....85**

Kazuhisa Mitobe (Yamagata University, Japan)  
Kohei Suzuki (Yamagata University, Japan)  
Atsushi Sekiya (Yamagata University, Japan)  
Syu-ji Koyama (Yamagata University, Japan)  
Genci Capi (Hosei University, Japan)

10:30 – 10:50

### Coffee Break

10:50 – 12:00

### Keynote: Can Robots Find Their Own Functions?

Kenji Doya, Okinawa Institute of Science and Technology (OIST)  
Session Chair: Wail Gueaieb (University of Ottawa, Canada) and  
Genci Capi (Hosei University)

12:00 – 13:30

### Lunch Break

13:30 - 15:30

**Tutorial II: Deep Learning for Sensor Fusion**

*Fahimeh Farahnakian (University of Turku)*

*Luca Zelioli (University of Turku)*

*Farshad Farahnakian (University of Turku)*

*Pouya Jafarzadeh (University of Turku)*

*Session Chair: Fahimeh Farahnakian (University of Turku)*

15:30 – 15:50

**Coffee Break**

15:50 - 17:50

**Session: Robotics and Applications II**

*Session Chair: Omar Hammami (ENSTA Paris, France)*

15:50

**Generalizing Construction Inspection Analysis With Low Cost UAV Line of Products.....N/A**

Omar Hammami (ENSTA Paris, France)

16:10

**Design of an SMA-based flat actuator with a pattern inspired by amphibian lungs.....91**

Sangmin Jeon (Hanbat National University, Korea (South))

Vishwanath Bijalwan (Hanbat National University, Korea (South))

Youngshik Kim (Hanbat National University, Korea (South))

16:30

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Genta Rexha (Polytechnic University of Tirana, Albania)

Arbnor Pajaziti and Xhevahir Bajrami (University of Prishtina, Kosovo)

Jozef Kola (Albanian University, Albania)

Genci Capi (Hosei University, Japan)

Goragod Pongthanisorn (Hosei University, Japan)

16:50

**Empirical UAV Power Consumption Evaluation for Optimized Power Constrained Low Cost UAV Line of Products Path Planning.....N/A**

Omar Hammami (ENSTA Paris, France)

17:10

**Tensegrity-inspired Multi-axis Positioning SMA Actuator.....102**

Hangyeol Baek (Hanbat National University, Korea (South))

Abdul Manan Khan (Department of Aerospace Engineering University of Bristol, Bristol BS8 1TR, U.K)

Vishwanat Bijalwan (Hanbat National University, Korea (South))

Sangmin Jeon (Hanbat National University, Korea (South))

Myeongho Jeong (Hanbat National University, Korea (South))

Youngshik Kim (Hanbat National University, Korea (South))

17:30

**Integration of Model Predictive Control and Proportional-Integral-Derivative Strategies for the Autonomous Path Tracking of Agricultural Wide-Span Implement Carriers.....107**

Xiaopeng Li (University of Ottawa, Canada)

Claude Laguë (University of Ottawa, Canada)

Thomas K Uchida (University of Ottawa, Canada)

17:50 - 18:00

**Best Paper Award**

*Wail Gueaieb, (University of Ottawa, Canada) and*

*Genci Capi (Hosei University, Japan)*

18:00 - 18:10

**Closing Remarks**

*Wail Gueaieb, (University of Ottawa, Canada) and*

*Genci Capi (Hosei University, Japan)*

## Additional Paper:

**An Online Model-Free Reinforcement Learning Approach for 6-DOF Robot Manipulators.....114**

Zeyad Hosny (University of Ottawa, Canada)

Abdullah Nassar (University of Ottawa, Canada)

Ahmed AboElyazeed (University of Ottawa, Canada)

Mahmoud Mohamed (University of Ottawa, Canada)

Mohammed Abouheaf (University of Ottawa, Canada)

Wail Gueaieb (University of Ottawa, Canada)