



Workshop on Artificial Intelligence and Smart Materials Systems

Department of Excellence on Robotics and AI
September 13-14, 2022 - Aula Magna

Scuola Superiore Sant'Anna, P.zza Martiri della Libertà 33, Pisa, 56127

PROGRAMME

Chairs: Alessandro Biondi, Marco Fontana
Co-Chairs: Matteo Cianchetti, Egidio Falotico, Francesco Greco, Paolo Tripicchio

September 13th, 2022

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- 09.00 - 09.15** **Welcome introduction:**
Sabina Nuti (Rector of Scuola Superiore Sant'Anna)
Paolo Dario (Emeritus Prof., First Chair of Dept. of Excellence)
Alessandro Biondi, Marco Fontana (Chairs)
- 09.15 - 10.30** **Keynote Talk I: Prof Fabio Roli, Univ. of Genoa**
"From known knowns to unknown unknowns in AI: Historical and Technical Issues"
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- 10.30 - 11.00** *Coffee Break*
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- 11.00 - 12.40** **Session I - Session chair: Alessandro Biondi**
Daniela De Luca, *"Predicting visual stimuli from cortical response recorded with widefield imaging in a mouse"*
Edwin Paul Herrera Alarcon, *"GNGraph: Self-Organizing Maps for Autonomous Aerial Vehicle Planning"*
Fabio Brau, *"On the Minimal Adversarial Perturbation for Deep Neural Networks with Provable Estimation Error"*
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Gerardo Camacho, *"On Multi-Agent Cognitive Cooperation: Can virtual agents behave like humans?"*

Giulio Rossolini, *"Increasing the Confidence of Deep Neural Networks by Coverage Analysis"*

12.40 - 14.20

Lunch Break

14.20 - 16.00 Session II – Session chair: Egidio Falotico

Mattia Garavagno, *"Human recognition for resource-constrained mobile robot applied to Covid-19 Disinfection"*

Michael Mugnai, *"An Efficient Object-Oriented Exploration Algorithm for Unmanned Aerial Vehicles"*

Federico Nesti, *"Detecting Adversarial Examples by Input Transformations, Defense Perturbations, and Voting"*

Lorenzo De Marinis, *"Photonic Analog Neuromorphic Computing"*

Francesco Restuccia, *"Time-Predictable Acceleration of Deep Neural Networks on FPGA SoC Platforms"*

16.00 - 16.30

Coffee Break

16.30 - 17.30 Session III – Session chair: Paolo Tripicchio

Biruk Seyoum, *"Spatio-Temporal Optimization of Deep Neural Networks for Reconfigurable FPGA SoCs"*

Salvatore D'Avella, *"Modeling multiple vehicle interaction constraints for behavior prediction of vehicles on highways"*

Federica Robertazzi, *"Brain-inspired meta-reinforcement learning cognitive control in conflictual inhibition decision-making task for artificial agents"*

September 14th, 2022

09.00 - 10.15 Keynote Talk II: Prof. Martin Kaltenbrunner, Univ. Linz
"Sustainable Materials and Design Approaches for Soft Electronics and Robotics"

10.15 - 10.40

Coffee Break

10.40 - 12.40 Session IV – Session chair: Marco Fontana

Giacomo Moretti, *"Electrostatic bellow muscle actuators and energy harvesters that stack up"*



Arianna Conte, *"Conductive Silicone Vocal Folds Reproducing Electroglottographic Signal in Pathophysiological Conditions"*

Diego Trucco, *"Graphene Oxide-doped Gellan Gum-PEGDA hydrogel mimicking the mechanical and lubrication properties of articular cartilage"*

Tommaso Bagneschi, *"Design and Characterization of Modular Soft Components for an Exoskeleton Glove with Improved Wearability"*

Luca Arleo, *"Layer Jamming for Variable Stiffness Shoes"*

Linda Paternò, *"A layer jamming actuator for tunable stiffness and shape-changing devices"*

12.50 - 14.20

Lunch Break

14.20 - 16.00

Session V – Session chair: Francesco Greco

Giovanni Faoro, *"Ultrasound Acoustic Phase Analysis Enables Robotic Visual-Servoing of Magnetic Microrobots"*

Mariangela Filosa, *"Intelligent touch sensors based on Fiber Bragg Gratings for collaborative robotics and wearable applications"*

Francesco Piquè, *"Controlling Soft Robotic Arms Using Continual Learning"*

Giancarlo Santamato, *"A Lightweight Robotic Device Based on a Micro-Macro Actuation Concept for the Inspection of Railway Pantograph"*

Marco Bolignari, *"Smith-Predictor-Based Torque Control of a Rolling Diaphragm Hydrostatic Transmission"*

16.00 - 16.15

Final remarks and future perspectives