



Politecnico
di Torino
Department
of Electronics and
Telecommunications



Università
di Genova



Springer

13th international conference on

APPLications in Electronics Pervading Industry, Environment and Society

APPLEPIES 2025

11-12 September 2025, Turin

www.applepies.eu (Free) registration required

DAY 1 Thursday 11 September

10.00-10.30 Opening and Introduction

10.30-11.30 Session S1 – Security and test

Break 11.30-12.00

12.00-13.00 Session S2 – AI applications I

Lunch break 13.00-14.00

14.00-15.20 Session S3 – IOT/Sensors I

Break 15.20-15.50

15.50-17.10 Session S4 – AI applications II

17.10-18.30 Session S5 – IOT/Sensors II

20.00 - Social dinner at “La via del sale”, located in the downtown, near the central Piazza Castello.

DAY 2 Friday 12 September

9.15-9.30 Introduction of Day2

9.30-10.15 Manuela Monti - Tutorial - Data governance: scenari e soluzioni per un percorso di compliance integrata (in italian)

10.15-11.15 Session S6 – RF applications

Break 11.15-11.45

11.45-12.45 Cybersecurity in Europe: The SERICS foundation

Maurizio Martina – SERICS project presentation

Alessandra Dolmeta - Introduction about Post-Quantum Cryptography



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Valeria Piscopo - A case of application: KRONOS

Mattia Mirigaldi - Side-Channel Attacks Overview: Live demo

Lunch break 12.45-13.45

13.45-15.05 Session S7 – Architectures

15.05-15.30 Conference Closing

Session S1 - 10.30-11.30 Thursday 11 September - Security and test

Chair: Luca Lazzaroni

- AI-based Privacy Management and Awareness for Smart Environments. Antoni Martínez-Ballesté (Universitat Rovira i Virgili)*; Maria Ferre (Universitat Rovira i Virgili); Agusti Solanas (Universitat Rovira i Virgili); Fran Casino (Universitat Rovira i Virgili)
- EmotiBitSec: A Security Layer for Wearable Bio-Sensing Devices. Edgar Batista (Universitat Rovira i Virgili)*; Marina Rull (Universitat Rovira i Virgili); Antoni Martínez-Ballesté (Universitat Rovira i Virgili)
- Edge DEvice Training Testbed. Dorvan Favre (He-Arc)*; Nuria Pazos (He-Arc)

Session S2 - 12.00-13.00 Thursday 11 September - AI applications I

Chair: Riccardo Berta

- Lightweight Deep Learning for SOC Estimation of Various Lithium-Ion Batteries on Xilinx ZCU104 FPGA. Danoush Faryar (University of Genoa); Riccardo Berta (University of Genoa); Matteo Fresta (University of Genoa)*; Ammar Saad (University of Genoa); Luca Lazzaroni (University of Genoa); Hadi Ballout (University of Genoa); Ossama Srour (University of Genoa); Francesco Bellotti (University of Genoa)
- Robust Multi-Class Classification of Alzheimer's Disease Using GAN and Conventional Augmentation on Filter-Enhanced Brain MRI Images. Mohamad Hajj-Hassan (Lebanese International University)*; Ali Cherry (The International University of Beirut); Mohamad Abouali (Lebanese International University); Hawraa Hotiet (University of Genoa); Lara Shahrou (Lebanese International University)
- Evolutionary NAS—Approach to Object Classification for Wearable Device. DANIELLA SHEBLY (University of Genoa)*; Christian Gianoglio (Unige); Maurizio Valle (University of Genova)

Session S3 - 14.00-15.20 Thursday 11 September - IOT/Sensors I

Chair: Paolo Motto Ros

- Self-Organising and Autonomous IoT-based Monitoring Units for Smart Environments. Edgar Batista (Universitat Rovira i Virgili)*; Constantin Shoot (Universitat Rovira i Virgili); Agusti Solanas (Universitat Rovira i Virgili); Antoni Martínez-Ballesté (Universitat Rovira i Virgili)
- Real-Time Vehicle Traffic Detection Using Distributed Fiber Optic Sensors Optimized Hardware Implementation of a Simplified Hough Transform. Stefano Marsi (DIA - UNITS)*; Aldo Minardo (University of Campania Luigi Vanvitelli); Alberto Carini (DIA - Università di

Trieste); Giulia Buttazzoni (DIA - UNITS); massimiliano commissio (DIA - UNITS); luigi Zeni (University of Campania Luigi Vanvitelli)

- Design and Implementation of an Efficient Multithreaded Event Data Recorder on Raspberry Pi 5. Miltos Grammatikakis (Hellenic Mediterranean University)*; Vasilis Kavvalos (Hellenic Mediterranean University); George Kornaros (Hellenic Mediterranean University)
- Practical Demonstration of a Wireless Sensor Network Based on Nano-drones for Integrity Assessment. Matteo Zauli (University of Bologna)*; Federica Zonzini (University of Bologna); Marco Pirazzi (University of Bologna); Luca De Marchi (University of Bologna)

Session S4 - 15.50-17.10 Thursday 11 September - AI applications II

Chair: Francesco Bellotti

- A CARLA Parking Environment for Training Deep-Reinforcement Learning Agents. Ali Zare (Università degli Studi di Genova); Francesco Bellotti (Università degli Studi di Genova); Riccardo Berta (Università degli Studi di Genova); Luca Lazzaroni (Università degli Studi di Genova); Luca Forneris (Università degli Studi di Genova); Alessandro Pighetti (Università degli Studi di Genova)*
- Exploring Neural Architecture Search (NAS) for Binary Neural Networks (BNNs) in the new WakeVision. Alessandro Pighetti (Università degli Studi di Genova)*; Francesco Bellotti (Università degli Studi di Genova); Sepehr Mohammady (Università degli Studi di Genova); Luca Lazzaroni (Università degli Studi di Genova); Hadi Ballout (Università degli Studi di Genova); Riccardo Berta (Università degli Studi di Genova)
- Unsupervised Waveform-level Analysis of Pantograph Voltage in the Italian Railways. Andrea Mariscotti (University of Genoa)*; Rafael Salles (Lulea University of Technology); Sarah Ronnberg (Lulea University of Technology)
- A Multi-Time-Window Machine Learning Approach for Rainfall Detection. MOSTAFA FTOUNI (University of Genoa)*; Christian Gianoglio (University of Genoa); Margherita Spalla (Artys srl); Matteo Colli (Artys srl); Andrea Randazzo (University of Genoa)

Session S5 - 17.10-18.30 Thursday 11 September - IOT/Sensors II

Chair: Guido Masera

- Automatic Aging Prediction of High Voltage Apparatus based on Differential Measurements. Christian Gianoglio (University of Genoa)*
- Real-Time Stereo Vision through Optimized FPGA Disparity Algorithms. Teresa Alfano (unipa); Gianluigi Chiarello (unipa)*; Salvatore Sapienza (unipa); Fulvio Lo Valvo (unipa); giacomo Baimonte (unipa); alberto vella (unipa); Giuseppe Galioto (unipa); Giuseppe Costantino Giaconia (Unipa)
- Wireless Batteryless RF Energy Harvester for Smart Devices. Muhammad Hamza (University of Trento); Matteo Nardello (University of Trento); Davide Brunelli (University of Trento)*
- Advanced Optimization Strategies for Real-Time Tactile Data Processing on Embedded platforms. Sara Awada (Lebanese International University)*; Ali Ibrahim (Lebanese International university); Mohamad Yaacoub (University of Genoa)

Session S6 – 10.15-11.15 Friday 12 September – RF applications

Chair: Marco Pirola

- Leveraging Software-Defined Radio and Deep Learning for Enhanced Physical Layer Spoofing Detection in C-V2X Communications. Danilo Greco (Politecnico di Milano)*; Giovanni Gaggero (Unige)
- Design of SIRW-Based Self-Diplexing Slot Antenna with Low Cross-Polarization Level for Millimeter-Wave Applications. Rusan Kumar Barik (SR University, Warangal, Telangana)*; Rajender Rathod (University of Pisa, Pisa); Daniele Rossi (University of Pisa, Pisa)
- Compact Polarization Insensitive Triple-Band Bandstop Frequency Selective Surface for Terahertz Applications. Rusan Kumar Barik (SR University, Warangal, Telangana)*; Rajender Rathod (University of Pisa, Pisa); Daniele Rossi (University of Pisa, Pisa)

Session S7 – 13.45-15.05 Friday 12 September – Hardware architectures

Chair: Alessandra Dolmeta

- Implementing the RISC-V Debug Specification on an Interleaved Multi-Threading Core. Andrea Marcelli (Sapienza University of Rome)*; Marco Pisani (Sapienza University of Rome); Marco Angioli (Sapienza University of Rome); Rocco Martino (Sapienza University of Rome); Antonio Mastrandrea (Sapienza University of Rome); Mauro Olivieri (Sapienza University of Rome)
- A Test System for an SRAM-based Mixed-Signal Accelerator. Michele Caselli (University of Parma)*
- Re-Architecting RISC-V: A 64-bit Take on Interleaved Multi-Threading. Andrea Marcelli (Sapienza University of Rome)*; Marco Pisani (Sapienza University of Rome); Rocco Martino (Sapienza University of Rome); Abdallah Cheikh (Sapienza University of Rome); Francesco Menichelli (Sapienza University of Rome); Mauro Olivieri (Sapienza University of Rome)
- A Dual Branch Quantized Neural Network for Road Surface Classification Using Smartphone Sensors. Sina Gholami Fashkhami (University of Genoa); Riccardo Berta (University of Genoa); Alessandro Pighetti (University of Genoa); Matteo Fresta (University of Genoa)*; Luca Lazzaroni (University of Genoa); Hadi Ballout (University of Genoa); Hadise Rojhan (University of Genoa); Francesco Bellotti (University of Genoa)

Poster Session

- Turning a Thermostat into an Agent at the Edge. Pietro Firpo (Dipartimento di Ingegneria Navale, Elettrica, Elettronica e delle Telecomunicazioni, Università degli Studi di Genova)*; Riccardo Berta (Dipartimento di Ingegneria Navale, Elettrica, Elettronica e delle Telecomunicazioni, Università degli Studi di Genova); Francesco Bellotti (Dipartimento di Ingegneria Navale, Elettrica, Elettronica e delle Telecomunicazioni, Università degli Studi di Genova); Danilo Pau (STMicroelectronics)
- Speeding up quantized DNN kernels having 4-bit integer weights using the SWAR approach. Lorenzo Grassi (Università di Pisa); Marco Cococcioni (Dept of Information Engineering)*
- Analysis, Design and Simulation of a Compact Rectenna System for Ultra-low Power IoT Systems. Alessandro Porta (Department of information engineering (DII), University of

Pisa)*; Ettore Noccetti (Department of information engineering (DII), University of Pisa); Francesca Bagnoli (Department of information engineering (DII), University of Pisa); Daniele Rossi (Department of information engineering (DII), University of Pisa); Sergio Saponara (Department of information engineering (DII), University of Pisa)

- Improving Lane Change Performance in CARLA through Curvature-Adaptive B-Spline Planning. Om Lbaneen Audi (University of Genoa)*; Francesco Bellotti (University of Genoa); Riccardo Berta (University of Genoa); Ziquan Liu (Queen Mary University of London); Luca Lazzaroni (University of Genoa); Alessandro Pilla (University of Genoa); Hadise Rojhan (University of Genoa); Luca Forneris (University of Genoa)
- Managing Performance Indicator (PI) Forms in a State of the Art Big Data Platform. Hadise Rojhan (University of Genoa)*; Francesco Bellotti (University of Genoa); Luca Lazzaroni (University of Genoa); Matteo Fresta (University of Genoa); Luca Forneris (University of Genoa); Alessandro Pighetti (University of Genoa); Riccardo Berta (University of Genoa)
- Electrochemical Impedance Spectroscopy of Commercial Sodium-Ion Batteries. Cesare Sandri (UNIFI); Roberto Di Rienzo (UNIFI)*; Federico Baronti (UNIFI); Roberto Roncella (UNIFI); Roberto Saletti (UNIFI)
- Solar Panel-based Visible Light Communication for Batteryless Systems. Juan Gutiérrez Gómez (Technische Universität Braunschweig)*; Nhung Nguyen Thi (Technische Universität Braunschweig); Jesus M. Quintero Quintero (Universidad Nacional de Colombia); Andres Gomez (Technische Universität Braunschweig)
- A Multi-Camera Fluorescence Detector for Enhancing Point-of-Care Instruments for Biomolecular Analyses. Walter Carli (Politecnico di Milano)*; Antonella Buquicchio (STMicroelectronics); Alessio Nicola (STMicroelectronics); Marco Carminati (Politecnico di Milano); Marco Bianchessi (STMicroelectronics)
- Secure and Compliant Smart Contract Analysis Using Lightweight CNNs. Hassen Louati (Kingdom University)*; Ali Louati (Prince Sattam Bin Abdulaziz University); Elham Kariri (Prince Sattam Bin Abdulaziz University); Abdulla Almekhlafi (Kingdom University); Maha ElSaka (Kingdom University)
- Modeling Power Electronics in Simulink. A Tutorial for MSc Electronic Engineering Students. Leonardo Motta (University of Genoa); Francesco Bellotti (University of Genoa); Riccardo Berta (University of Genoa); Luca Lazzaroni (University of Genoa); Matteo Fresta (University of Genoa)*; Nicolò Busi (University of Genoa)
- A Collaborative GitHub Framework for Project-Driven Learning in Microcontroller-based Embedded Systems. Emanuele Castagno (University of Genoa); Francesco Bellotti (University of Genoa); Riccardo Berta (University of Genoa); Luca Lazzaroni (University of Genoa)*; Matteo Fresta (University of Genoa); Simone Incerti (University of Genoa)
- A Comparative Evaluation of UWB and BLE AoA for Short-Range Indoor Localization. Matteo Nardello (University of Trento)*; Matteo Marconi (University of Trento); Davide Brunelli (University of Trento)
- Linear Optimal Transport for Domain Adaptation in Neuromorphic Tactile Texture Classification. Leila Hamadi (university of genoa)*; Mohamad Yaacoub (University of Genoa); Haydar Alhaj Ali (Univeristy of Genoa); Maurizio Valle (University of Genoa); Yahya Abbass (University of genoa)

- Exploring Neuromorphic Cameras for In-Orbit Space Object Classification: A Feasibility Study. Alessandra Colucci (Politecnico di Bari); Giulio Campiti (Politecnico di Bari); Giuseppe Brunetti (Politecnico di Bari); Caterina Ciminelli (Politecnico di Bari)*
- Embedded Deployment of an LLM-based Voice Assistant. Luca Lazzaroni (University of Genova)*; Francesco Bellotti (University of Genova); Alessandro Pighetti (University of Genova); Ammar Saad (University of Genova); Ossama Srour (University of Genova); Riccardo Berta (University of Genova)
- Trusting IoT Devices at Scale in the Computing Continuum Through SPIFFE/SPIRE Certificates. George Kornaros (Hellenic Mediterranean University)*; Dimitris Bakoyiannis (Hellenic Mediterranean University); Othon Tomoutzoglou (Hellenic Mediterranean University); Mitlos Grammatikakis (Hellenic Mediterranean University); Marcello Coppola (STM)
- Comparing Complete and Incomplete Formal Verification in Deep Learning-based Object Detection. Vafali Soltanmuradov (University of Genova)*; Francesco Bellotti (University of Genova); Riccardo Berta (University of Genova); David Martín Gómez (Universidad Carlos III de Madrid); Luca Lazzaroni (University of Genova)
- TruthSentry: A Scalable Framework for Fake News Detection via Advanced NLP and Ensemble Learning. Afifa Hussain (University of Aveiro); Nooruddin Noonari (University of Aveiro)*; Kaleem Arishid (Department of Electrical Engineering, Universidad Carlos III de Madrid); Nizamuddin maitlo (Sukkur IBA); Vafali Soltanmuradov (Department of Electrical Engineering, Universidad Carlos III de Madrid)
- Optimizing Binary AutoEncoders on STM32 Microcontrollers. Hadi Ballout (University of Genova)*; Riccardo Berta (University of Genova); Luca Lazzaroni (University of Genova); Fouad Sakr (Aptiv); Alessandro Pighetti (University of Genova); Matteo Fresta (University of Genova); Francesco Bellotti (University of Genova)
- Design and Implementation of Low Power Maximum Power Point Tracking Circuit for Portable Applications. Hasan Birjawi (Lebanese International University)*; Ali Ibrahim (Lebanese International University); Adnan Harb (Lebanese International University); Zeinab Hijazi (Lebanese International University)
- Dynamic Model for Preliminary Hazard Analysis in Autonomous Railway Application. Daniela De Venuto (Politecnico di Bari)*; Mario Barbareschi (Università Federico II Napoli); Diana Serra (RFI); Vincenzo Scarola (Politecnico di Bari)
- Resource-Adaptive FPGA-Based Kernels for Accelerating Self-Attention in Transformers. Ammar Saad (University of Genova)*; Francesco Bellotti (University of Genova); Hadi Ballout (University of Genova); Matteo Fresta (University of Genova); Luca Lazzaroni (University of Genova); Ossama Srour (University of Genova); Riccardo Berta (University of Genova)
- UVM-Based Verification of a Configurable Data Flow-Control IP Core for FPGA CNN Accelerators. Angelo Paone (University of Pisa)*; Tommaso Pacini (University of Pisa); Luca Zulberti (University of Pisa); Pietro Nannipieri (University of Pisa); Luca Fanucci (University of Pisa)



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- Smart Wildlife Monitoring: Power and Bandwidth Efficient Real-Time Object Tracking with Local Binary Similarity Matching on Resource Constrained Edge Network. Md Auhidur Rahman (University of Pisa)*
- Anomaly Detection in Railway Tracks Using Contact Force Spectra and Machine Learning. Giovanni Bellacci (University of Florence)*; Niccolò Baldanzini (University of Florence); Luca Pugi (University of Florence)
- AI-based WideBand Direction of Arrival Estimation on FPGA. Lorenzo D'Antonio (Tor Vergata University of Rome); Sergio Spanò (Tor Vergata University of Rome)*; Riccardo La Cesa (Tor Vergata University of Rome); Cristian Valenti (Tor Vergata University of Rome); Udhaya Damodarin (Tor Vergata University of Rome); Luca Di Nunzio (Tor Vergata University of Rome)
- Hardware Aware Neural Architecture Search for Optimized Embedded Texture classification in Multisensory Glove. Hiba Al Youssef (University of Genova)*; Ali Ibrahim (lebanese international university); Mohamad Yaacoub (University of Genova)



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