2026 IEEE International Conference on Smart Computing Workshops and Other Affiliated events (SmartComp Companion 2026)

Messina, Italy
22-25 June 2026

IEEE Catalog Number: CFP264CL-POD
ISBN: 979-8-3195-4417-9

IEEE Advancing Technology for Humanity

Copyright © 2026, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP264CL-POD
ISBN (Print-On-Demand):	979-8-3195-4417-9
ISBN (Online):	979-8-3195-4416-2

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

CURRAN ASSOCIATES INC. proceedings .com

TABLE OF CONTENTS

A Machine Learning Approach for Sleep Apnea Detection Using Unobtrusive In-Bed Sensors 1
Ricky Marinsalda, Eleonora Melissa, Carlotta Marinai, Lucia Arcarisi, Francesco Bossi, Pasquale Bufano Francesco Di Rienzo, Gianluca Rho, Michele Zanoletti, Alberto Greco, Carlo Vallati, Nicola Carbonaro Marco Laurino, Alessandro Tognetti

Robust Wearable Stress Detection using Physiological Feature Engineering and Subject-Independent Evaluation 7
Paul Ben O'Brien, Malik Muhammad Qirtas, Andrea Visentin

CLICK-SAM: A CLinical Interactive Click-based Kit for Digital Breast Tomosynthesis segmentation 13
Giada Anastasi, Giulio Del Corso, Michela Franchini, Sabrina Molinaro, Stefania Pieroni

Multimodal-to-Semantics Large Language Model Framework for Loneliness Assessment 19
Chenxin Chen, Iman Azimi, Amir M. Rahmani, Pasi Liljeberg

RamanLLM: Reprogramming Frozen Large Language Models for Raman Spectral Analysis 25
Álvaro García, Simone Innocente, Nicola Caroline Rossberg, Malik Muhammad Qirtas, Andrea Visentin

Automated Distributed Ledger Infrastructure for Continuous Cybersecurity Certification in Multi-Stakeholder Environments 31
Álvaro Navarro Martínez, Sara Nieves Matheu García, Antonio Fernando Skarmeta Gómez

Deployment-Aware Parameter Optimization for IoT Attack Detection 37
Mohammed Nasereddin, Erol Gelenbe

Cross-Domain Convolutional Autoencoder-Based Anomaly Detection for Whole-Lifecycle Security of Cyber-Physical Systems 43
Diego Argüello Ron, Armando Aguayo-Mendoza, Oscar Garcia Perales

Context Matters: Vulnerability Categorization with Dual-Input Code Representations 49
Anna Maria Voulkopoulou, Ilias Kalouptsoglou, Dionysios Kehagias, Dimitrios Tzovaras

On feasibility of network based firmware change detection 55
Joerg Abendroth, Egil Wille, Martin Gilje Jaatun, Manuel Leone

An Heuristic and Explainable Unsupervised Concept Drift Detector 61
Gabriele Nicolò Costa, Alessandra De Paola, Salvatore Drago, Pierluca Ferraro, Giuseppe Lo Re

Cyber defense framework for 5G/6G using a Network Digital Twin 67
Ioannis Vasalos, Efstathios Zaragkas, Athina Vekraki, Maria Christopoulou, Michail Alexandros Kourtis George Xilouris, Nikos Dimitriou

Automatic Association of Cloud Security Controls and Quantifiable Metrics for Certification 73
John Bianchi, Shuya Dong, Luca Petrillo, Marinella Petrocchi

Solving Currency Arbitrage Problems using D-Wave Advantage2 Quantum Annealer 79
Lorenzo Mazzei, Giada Beccari, Mirko Laruina, Marco Cococcioni

Explainable Quantum Machine Learning for IoMT Security: Evaluating Quantum Advantage 85
Vincenzo Spadari, Alfredo Nascita, Idio Guarino, Domenico Ciuonzo, Antonio Pescapè

Assessing the Feasibility of Quantum Autoencoders for Real-World Visual Anomaly Detection 91
Farida Farsian, Attilio Azzarelli, Fabrizio De Vita, Giovanni Merlino, Francesco Schilliró

Federated Variational Quantum Neural Networks for Privacy-Preserving Anomaly Detection in IoT 97
Radhakrishnan Delhibabu, Manuel Mazzara, Salvatore Distefano

A Recipe for Data-driven Medicine: Data Encoding, Machine Learning, and Quantum Computing 103
Salvatore Distefano, Mansur Ziiatdinov

Towards Quantum Networks: Characterizing Raman Noise over Metropolitan-scale Fiber Network 109
Marcello Caleffi, Laura d'Avossa, Italo Ignacio Machuca Flores, Marco Grillo, Elena Montella Angela Sara Cacciapuoti

Traveling Salesman Problem with a preprocessing method for classical and quantum optimization 114
Alessia Ciacco, Luigi Di Puglia Pugliese, Francesca Guerriero

QAIRAS: A Resource-Bounded Hybrid Quantum-Inspired Architecture for Secure Smart Systems 120
Patrick Hamilton, M. Arif Khan, Md. Rafiqul Islam, Fendy Santoso

Integrating Classical and Quantum PUF with QKD for Secure IoT Networks 126
Franco Cirillo, Maria Caterina D'Aloia, Christian Esposito

Quantum k-means based on Quantum Local Sensitive Hashing with Application to Irrigation Machine Sensors Data Clustering 132
Kamil Khadiev, Aliya Khadieva

Q2NS Demo: A Quantum Network Simulator Based on ns-3 138
Francesco Mazza, Adam Pearson, Marcello Caleffi, Angela Sara Cacciapuoti

Policy-Driven Federated Learning: Operationalising Governance, Trust, and Compliance in Cross-Organisational AI 141
Tharindu Ranathunga, Sourabh Bharti, Alan McGibney

Sparse-BP: Efficient On-Device Backpropagation for Resource-Constrained Systems 147
Rawan M. A. Nawaiseh, Enrico Catalfamo, Fabrizio De Vita

A Balanced-Scorecard-Aligned Mapping for Data Valuation Metrics 153
Eduardo Vyhmeister, Udo Bub, Rob Schneider, Andres Visentin

Improving Authenticity of x402 Payment Protocol through verification of Agent's Intention with Zero-knowledge Proof 159
Subhasis Thakur, Martin Serrano

Semantically Enriching Investor Micro-blogs for Opinion-Aware Emotion Analysis: A Practical Approach 165
Gaurav Negi, Omnia Zayed, Martin Serrano, Paul Buitelaar

FedLLM-Align: Feature Extraction From Heterogeneous Clients 171
Abdelrhman Gaber, Muhammad El-Mahdy, Youssif Abuzied, Hassan Abd Eltawab, Tamer ElBatt

Benchmarking Object Detection Models for Tuta Absoluta Egg Identification in Field Images 177
Georgios Katranas, Isaak Kavasidis, Zisis Tsiropoulos, Ioannis Gravalos

An AI-driven Digital Twin Methodology To Optimize Irrigation in Greenhouses 183
Ilenia Ficili, Maurizio Giacobbe, Giuseppe Tricomi, Antonio Puliafito

PesTwin: a biology-informed Digital Twin for enabling precision farming 189
Andrea De Antoni, Matteo Rucco, Alberto Maria Cattaneo, Ege Gezer, Giuseppe Sulis, Paola Draicchio Giovanni Iacca, Andrea Pugliese, Maria Vittoria Mancini

Evaluating Weak Supervision for Grapevine Segmentation in UAV-based RGB Imagery 195
Danilo Leite, Pedro Marques, Luis Pádua, Joaquim J. Sousa, Raul Morais, António Cunha

Smart Agrivoltaics for Precision Agriculture: a Sustainable Simulation-Driven Architecture 201
Gabriele Cecchetti, Anna Lina Ruscelli, Piero Castoldi

Photovoltaic Vs National Grid Energy in Controlled Environment Agriculture (CEA) for Enhanced WEFE Nexus: A Jordanian Case Study 207
Tetiana Buzykina, Omar Bawab, Asiya Khan, Husameddin Alhaj Ali, Nagham Saeed, Mohammad Mashatieh

A Data Governance Framework for Socio-Ecological Value in Smart Agriculture 213
Saeed Niksaz, Fisnik Dalipi, Avni Rustemi

WISDOM: Water and energy efficient Irrigation using Smart Drone-Orchestrated Microservices 219
Abhishek Pandey, Sourav Kanti Addya

Enabling the Cloud-to-Autonomous-Vehicles continuum for future Industrial IoT Applications: the CAVIA approach 225
Gianluca Filippone, Francesca Righetti, Francesco Di Rienzo, Marco Autili, Alberto Ceselli Christian Quadri, Carlo Vallati

Toward a Distributed Hypervisor for I/O Virtualization in the Cloud-to-Things Compute Continuum 231
Giovanni Lombardo, Antonio Puliafito, Giovanni Merlino, Francesco Longo

Toward Deviceless Paradigm: An IoT-centered and Orchestrated FaaS Architecture 237
Fabio Orazio Mirto, Luca D'Agati, Giuseppe Tricomi, Francesco Longo, Carlo Puliafito, Antonio Virdis Giovanni Merlino

Automated Litter Characterization for Smart Cities 243
Emily Diaz-Silva, Grace Gao, Nidhi Begur, Sandina Charles, Rishith Arra, Suvosree Chatterjee Mahdi Zarif, Jason O. Hallstrom

Information-Extraction-Guided LLM Generation of WoT Thing Descriptions for Services 249
Lara Sormani, Giuseppe Vizzari, Flavio De Paoli

PLAIground: SLO-Driven Runtime Model Selection for Compound AI Systems in the Edge-Cloud-Space Continuum 255
Milos Gravara, Cynthia Marcelino, Andrija Stanisic, Stefan Nastic

Secure and Dependable UAV through Rejuvenation 261
Maurizio Giacobbe, Marco Scarpa, Salvatore Distefano

Towards neurosymbolic network intrusion detection 267
Vito Scaraggi, Andrea Passarella, Marco Conti

Edge-Based PPE Detection for Urban Construction Under Realistic Visual Conditions 273
Giustino Claudio Miglionico, Francesco Di Rienzo, Pietro Ducange, Francesco Marcelloni, Carlo Vallati

Optimizing LoRaWAN Coverage for IoTaaS in Dense Urban Scenario through Validation-Based Radio Planning 279
Maurizio Giacobbe, Sarah Zanafi, Antonio Puliafito

Dynamic Cluster-Head Rotation for Energy-Aware Predictive Wireless Sensor Networks 284
Imourane Abdoulaye, Dorian Diana, Laurent Rodriguez, Cécile Belleudy, Benoît Miramond

Neuro-Symbolic AI for Industrial Systems: Bridging Deep Learning and Domain Expertise 290
Ghena Barakat, Harshit Gupta, Francesco Longo, Giovanni Merlino, Antonio Puliafito

PROAIR: A Digital Twin Framework for Urban Air Quality Forecasting via Temporal Fusion Transformers and Scenario-based What-if Analysis 297
Mario Molinara, Marco Cantone, Ciro Russo, Alessandro Bria, Claudio Marrocco, Simone De Vita Michelangelo Esposito, Giovanni D'Acunto, Claudio Pagano, Gaetano Rocco

Towards a Zero-Touch Provisioning Approach for Heterogeneous Edge Platforms using UEFI and iPXE Boot 303
Théo Manea, Zakaria Benomar, Laurent Corbin, Anatole Pham Nguyen Duy, Jerôme Venant Alexandre Berne

Energy-Aware Multi-Objective Resource Allocation of Real-Time Mobile Applications in the Cloud-to-Things Continuum 309
Marco Pettorali, Lorenzo Moni, Francesca Righetti, Giuseppe Anastasi

Context-Aware Recommendation for Smart Tourism: A Framework for Enhancing Archaeological Park Experiences 315
Francesco Colace, Marco Lombardi, Angelo Lorusso, Domenico Santaniello, Pietro Strollo Carmine Valentino

Detecting Cyber-Attacks in Connected Vehicles through Context-Aware Multilevel Graph Modeling 321
Mario Casillo, Francesco Colace, Angelo Lorusso, Domenico Santaniello, Giusy Strollo, Carmine Valentino

When Seconds Matter – Designing Sensor-driven Emergency Services for Smart Cities 328
Spyridon Georg Koustas, Timon Sengewald, Angela Roth

An IoT-Driven Machine Learning Framework for Real-Time Monitoring in Smart Buildings 334
Mostafa Zaman, Sujay Saha, Gayatri Bhavana Addala, Nasibeh Zohrabi, Sherif Abdelwahed

S-CI: An Agent-Based AI Framework for Strategic Competitive Intelligence in the Geoeconomic Age 340
Andrea Puliafito

Exploring Geospatial Features for Short-Term Energy Forecasting in EBus with Machine Learning 346
Manuel Andruccioli, Bryce Chao, Hugo Badia, Giovanni Delnevo, Miquel Estrada, Silvia Mirri

Zero-Trust Secure Network Slicing for Autonomous Vehicle Platooning 352
Quazi Mamun, Marco Picone

Optimized Collective Perception Service for Vehicular Networks 358
Thenuka Karunathilake, Anna Förster

Short-Term Fuel Forecasting in Urban Bus Fleets: A Data-Driven Approach for Transport Operations 364
Manuel Andruccioli, Miquel Estrada, Giovanni Delnevo, Silvia Mirri

A Semantic Digital Twin for Occlusion-Aware Cooperative Collision Prediction 370
Malik Luti, Daniel Šolc, Matúš Dopiriak, Zixia Xia, Juraj Gazda, Marco Levorato

Quadruped Robots in Smart Mobility Systems: Applications, Challenges, and Integration Gaps 376
Kelvin Olaiya, Eugenio Tampieri, Manuel Andruccioli, Giovanni Delnevo, Chan-Tong Lam, Giovanni Pau Paola Salomoni

DEMO: Multi-Attribute Dimensional Entity Behaviour Analytics for Anomaly Detection in Smart Cloud Systems (MAD-EBA) 382
Venkata Saikumar Thalupuru, Santhoshini Pranathi Singaraju, Vishal Gupta

Capacitive Swipe Gesture-Based User Identification Using Deep Learning and Image Fusion 385
Kaye Feinberg, Md Shafaeat Hossain, Jundong Chen

DEMO: SLImTAG – Lightweight Segmentation with Domain Adaptation 388
Giulio Del Corso, Oscar Papini, Federico Volpini, Giada Anastasi, Sara Colantonio

Privacy-preserving Agentic Reporting for IoT Asset Monitoring: A Preliminary Case Study 391
Christian Riccio, Fabrizio Lapiello, Roberto Falso, Flavia Valentina Di Rauso, Emanuel Di Nardo Angelo Ciaramella, Mauro Iacono

Optimization of Energy Costs and EV Battery Health in V2G Enabled Homes 394
Jainam Dhruva, Dzifa Hodey, Simone Silvestri

DEMO: Waste Collection Trucks as Mobile Urban Sensing Platform: A LoRaWAN-Based Prototype 397
Carmine Colarusso, Ida Falco, Eugenio Zimeo

From Benchmark Images to Georeferenced Street Inspection: Lessons from an Operational Road Distress Detection Pipeline 400
Joaquín Olivares, José María Castillo-Secilla, José Manuel Palomares

Demo: Deriving LUT-based Neural Network Hardware Accelerators for Tiny Smart Sensor Systems 403
Lukas Einhaus, Natalie Maman, Julian Hoever, Andreas Erbslöh, Gregor Schiele

PhD Forum: Towards a Lightweight Foundation Model for Smart-Home Sensor Data 406
Michele Fiori

PhD Forum: Learning Adaptive Adversarial Attacks for Medical AI via Reinforcement Learning 409
Manuel Fabiano

PhD Forum: Talk to Your Agent: LLM-Based Trajectory Grounding and Behavioral Correction in RL 412
Gaetano Pio Pispisa

Phd Forum: Toward FPGA Virtualization on the Compute Continuum 415
Vincenzo Alessio Bucaria

PhD Forum: BioDevOps: Toward a Formal Framework for Continuous Deployment in Safety-Critical Medical Devices 418
Fabio Orazio Mirto

PhD Forum: Deployable Microtransit Routing. Embedding Operational Constraints in the Pickup and Delivery Problem with Time Windows 421
Agrima Khanna

PhD Forum: Zero-Shot Cross-Domain Forecasting of Residential Load and Indoor Temperature 424
Jainam J. Dhruva

PhD Forum: From Incremental Learning to Federated Distillation, Continual and Privacy-Preserving Intelligence at the Edge 427
Ilenia Ficili

PhD Forum: Trust and Trustworthiness-Aware Congestion Reduction of Drivers of Ground Vehicles with Dynamic, Heterogeneous Autonomy 430
Doris E. M. Brown