

# TECHNICAL PAPERS PROGRAM

San Francisco	New York	Aveiro	Rome	New Delhi	Beijing
00:30h-02:30h PDST	03:30h-05:30h EDST	08:30h-10:30h WEDST	09:30h-11:30h CEST	13:00h-15:00h IST	15:30h-17:30h CT
03:00h-05:00h PDST	06:00h-08:00h EDST	11:00h-13:00h WEDST	12:00h-14:00h CEST	17:30h-19:30h IST	20:00h-22:00h CT
06:00h-08:00h PDST	09:00h-11:00h EDST	14:00h-16:00h WEDST	15:00h-17:00h CEST	20:30h-22:30h IST	23:00h-01:00h CT (Next Day)
08:30h-10:30h PDST	11:30h-13:30h EDST	16:30h-18:30h WEDST	17:30h-19:30h CEST	23:00h-01:00h IST (Next Day)	01:30h-03:30h CT (Next Day)

## TECHNICAL PROGRAM AND SCHEDULE

### Technical Program Committee Chairs:

- **Augusto Casaca**, INESC-ID/ INOV INESC INOVAÇÃO, Lisbon, Portugal
- **Ahmed Abdelgawad**, Central Michigan University, Mt. Pleasant, Michigan, USA
- **Tony Quek**, Singapore University of Technology and Design, Singapore

## TECHNICAL SESSION SESSION-01 : MONDAY OCTOBER 16<sup>TH</sup>, 2023. SMALL AUDITORIUM

11:00h – 13:00h WEDST (Western European Daylight Savings Time – Aveiro, Portugal)

- **Applications and Use Cases: LoRA-based Services**

Chair and Moderator

Pedro Casau, Universidade de Aveiro, Aveiro, Portugal

Papers

1220	<b>“LoRaWAN Infrastructure for Urban Waste Management: a simulation study”</b> , Lahis Almeida, Marianna Gois Campos, and Juliana Freitag Borin; Instituto de Computação, Universidade Estadual de Campinas, Campinas, Brazil.
1247	<b>“Performance Study of LoRaWAN, LoRaMesh, and Hybrid Networks for a Smart Farming Scenario”</b> , Jocines Dela Flora da Silveira <sup>1</sup> , Artur Felipe da Silva Veloso <sup>1</sup> , Vinicius Uchoa Oliveira <sup>2</sup> , and José Valdemir dos Reis <sup>1</sup> ; (1) Federal University of Piauí, Teresina, Brazil; (2) Universidade de Aveiro, Aveiro, Portugal.

1237	<b><i>“RELIANCE: A Reliable and Power Efficient LoRaWAN Optimization Approach for Green IoT Ecosystems”</i></b> , Ebrahim Darabi <sup>1</sup> , Azin Moradbeikie <sup>2</sup> , Ahmad Keshavarz <sup>1</sup> , Sergio Ivan Lopes <sup>2</sup> ; (1) Persian Gulf University, Bushehr, Iran; (2) CinTin - Centro de Interface Tecnológico Industrial, Inovarcos, Arcos de Valdevez, Portugal.
1184	<b><i>“Intelligent Irrigation Technique for LoRa Enabled Fog Assisted Smart Agriculture”</i></b> , Dasari Rajasekhar <sup>1</sup> , Jinpeng Miao <sup>2</sup> , Shivakant Mishra <sup>2</sup> , Sanjeet Kumar Nayak <sup>1</sup> , Ramanarayan Yadav <sup>3</sup> ; (1) IIITDM Kancheepuram, Chennai, India; (2) University of Colorado, Boulder Colorado, USA; (3) IITRAM Ahmedabad, Ahmedabad, India.

- **Applications and Use Cases: Smart Farming**

<b>Chair and Moderator</b>	<b>Pedro Casau</b> , Universidade de Aveiro, Aveiro, Portugal
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<b>Papers</b>	
1181	<b><i>“IoT-based Sustainable Management of Plant Light Requirements in Vertical Farming”</i></b> , Hadjer Bouzebiba, Oussama Hadj Abdelkader, and A. Pedro Aguiar; Research Center for Systems and Technologies, SYSTEC - ARISE, Porto, Portugal.
1100	<b><i>“IoChain: A Decentralized Multichain-Based Architecture for IoT Smart Agriculture Using IPNS”</i></b> , Hêndrick Bataglin Gonçalves, and Fabiano Passuelo Hessel; Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, Brazil.
1186	<b><i>“Edge Computing in Smart Agriculture Scenario based on TinyML for Irrigation Control”</i></b> , Carlos Hernández Hidalgo, Aurora González-Vidal, and Antonio F. Skarmeta; University of Murcia, Murcia, Spain.
1208	<b><i>“Energy Efficiency IoT System for Aeration in Aquaculture 4.0”</i></b> , Victor Matheus Falcão Fonseca, Obionor de Oliveira Nóbrega, Luis Otavio Brito da Silva, and Danilo Ricardo Barbosa de Araújo; Rural Federal University of Pernambuco, Recife, Brazil.

## TECHNICAL SESSION SESSION-02 : MONDAY OCTOBER 16TH, 2023. SMALL AUDITORIUM

16:30h – 17:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Applications and Use Cases: UAV-based Services**

<b>Chair and Moderator</b>	<b>Daniel Corujo</b> , Universidade de Aveiro, Aveiro, Portugal
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<b>Papers</b>	
1126	<b><i>“Cloud to the Edge Computing Continuum Exploiting the third Spatial Dimension: A practical approach”</i></b> , Jesús Pérez <sup>1</sup> , Luis Francisco Diez <sup>1</sup> , Luis Muñoz <sup>1</sup> , Pedro Velasco <sup>2</sup> , Zbigniew Kopertowski <sup>2</sup> , Andrzej Zielinski <sup>2</sup> , Jaroslaw Legierski <sup>2</sup> , and Antonio Cuadra <sup>4</sup> ; (1) Universidad de Cantabria, Santander, Spain; (2) Amper, Madrid, Spain; (3) Orange Polska, Warsaw, Poland; (4) Indra Solutions, Valladolid, Spain.
1375	<b><i>“A Mobility-aware Flying Edge Computing Service Orchestration with Quality of Service Support”</i></b> , Hugo Leonardo Melo dos Santos <sup>1</sup> , Iago Lins de Medeiros <sup>1</sup> , Carlos Rocha <sup>1</sup> , Denis Lima do Rosário <sup>1</sup> ,

	Eduardo Coelho Cerqueira <sup>1</sup> , and Torsten Ingo Braun <sup>2</sup> ; (1) Federal University of Pará, Belem, Brazil; (2) University of Bern, Bern Switzerland.
1179	<b>“Active Inference for Sum Rate Maximization in UAV-Assisted Cognitive NOMA Networks”</b> , Felix Obite <sup>1</sup> , Ali Krayani <sup>1</sup> , Atm S. Alam <sup>2</sup> , Lucio Marcenaro <sup>1</sup> , Arumugam Nallanathan <sup>2</sup> , and Carlo Regazzoni <sup>1</sup> ; (1) University of Genoa, Genoa, Italy; (2) Queen Mary University of London, London, UK.
1248	<b>“An Optimized Object detection Algorithm for Unmanned Aerial Vehicles (UAVs)”</b> , Temilola Oreoluwa Onifade, Omar Eldash, and Magdy Bayoumi; University of Louisiana at Lafayette, Lafayette, Louisiana USA.

## TECHNICAL SESSION-03 : TUESDAY OCTOBER 17TH, 2023. SMALL AUDITORIUM

08:30h – 10:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- Applications and Use Cases: Smart Environments

Chair and Moderator

Diogo Gomes, Universidade de Aveiro, Aveiro, Portugal

Papers

1152	<b>“Permissioning and Personal Data Management in Alternate-Tenancy Smart Environments”</b> , Catarina Silva <sup>1</sup> , Vitor Jesus <sup>2</sup> , Joao Paul Barraca <sup>3</sup> , Antonio Nehme <sup>4</sup> , Gilad Rosner <sup>5</sup> , Mohammad Waqas <sup>6</sup> , and Rui L Aguiar <sup>1,3</sup> ; (1) Instituto de Telecomunicacoes; (2) Aston University, Birmingham, UK; (3) University of Aveiro, Aveiro, Portugal; (4) Birmingham City University, Birmingham, UK; (5) IoT Privacy Forum Winchester, UK; (6) Privdash Ltd, London, UK.
1073	<b>“A Two-Stage IoT Window Intrusion Detection System”</b> , Lars Mathuseck, Johann Götz, Michel Morold, and Klaus David; University of Kassel, Kassel, Germany.
1166	<b>“RemixDrum: A Smart Musical Instrument for Music and Visual Art Remix”</b> , Rômulo Augusto Vieira <sup>1</sup> , Débora Christina Muchaluat-Saade <sup>1</sup> , Marcelo Rocha Marques <sup>1</sup> , Célio Vinícius Albuquerque <sup>1</sup> , and Pablo César Garcia <sup>2</sup> ; (1) Fluminense Federal University, Niteroi, Rio de Janeiro, Brazil; (2) Centrum Wiskunde & Informatica – CWI, TU Delft, The Netherlands.
1232	<b>“Optimizing IoT-Based Asset and Utilization Tracking: Efficient Activity Classification with MINIROCKET on Resource-Constrained Devices”</b> , Marco Giordano <sup>1</sup> , Silvano Cortesi <sup>1</sup> , Michele Crabolu <sup>2</sup> , Lavinia Pedrollo <sup>2</sup> , Giovanni Bellusci <sup>3</sup> , Tommaso Bendinelli <sup>3</sup> , Engin Tueretken <sup>3</sup> , Andrea Dunbar <sup>3</sup> , and Michele Magno <sup>1</sup> ; (1) ETH Zürich, Zürich, Switzerland; (2) Hilti Corporation, Schaan, Liechtenstein; (3) CSEM SA, Neuchâtel, Switzerland.

- Applications and Use Cases: Water Monitoring Services

Chair and Moderator

Diogo Gomes, Universidade de Aveiro, Aveiro, Portugal

Papers

1119	<b>“Cross-Domain Buoy Placement for Underwater Target Tracking in Marine Wireless Networks”</b> , Yichen Li, Wenbin Yu, Liangyu Jiang, and Buyiyi Wang; Shanghai Jiao Tong University, Shanghai, China.
1130	<b>“The Blue Dataverse: A System for Marine Data Sovereignty”</b> , Vasileios Karagiannis <sup>1</sup> , Mays AL-Naday <sup>2</sup> , and Tom De Block <sup>3</sup> : (1) Austrian Institute of Technology, Vienna, Austria; (2) University of Essex, Colchester, UK; (3) Alliance for IoT and Edge Computing Innovation IVZW (AIOTI), Brussels, Belgium.
1335	<b>“Optical Wireless Communications for Underwater Monitoring and Smart Indoor Farming Applications”</b> , Alexis Dowhuszko <sup>1</sup> , Luis Rodrigues <sup>2</sup> , Luis Nero Alves <sup>2</sup> , Máximo Morales Cespedes <sup>3</sup> , Vicente Matus <sup>2</sup> , Rafael Perez-Jimenez <sup>4</sup> , Julio Rufo <sup>5</sup> , Alessandro Romano <sup>6</sup> , Anna Maria Vegni <sup>6</sup> , and Ikenna Chinazaekpere Ijeh <sup>7</sup> ; (1) Aalto University, Aalto, Finland; (2) Universidade de Aveiro, Aveiro, Portugal; (3) Universidad Carlos III de Madrid, Madrid, Spain; (4) Universidad de Las Palmas de Gran Canaria, Portugal; (5) Universidad de La Laguna, Santa Cruz de Tenerife, Spain; (6) Roma Tre University, Rome, Italy; (7) Alex Ekwueme Federal University, Abakaliki, Nigeria.
1154	<b>“String Tension based Borewell Water Level Monitoring using IoT”</b> , Tanmay Himanshu Bhatt, Thomas David Tency, Ritik Pradip Yelekar, and Sachin Chaudhari; International Institute of Information Technology, Hyderabad, India.

#### TECHNICAL SESSION-04 : TUESDAY OCTOBER 17TH, 2023. SMALL AUDITORIUM

11:00h – 13:00h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Applications and Use Cases: Smart Mobility**

**Chair and Moderator**                      **Tiago Barros**, CESAR School, Recife, Brazil

1175	<b>“Interference Suppression Arbitration Control for In-vehicle UWB Wireless Networks”</b> , Makoto Okuhara <sup>1</sup> , Nobuyuki Kurioka <sup>2</sup> , Patrick Finnerty <sup>1</sup> , and Chikara Ohta <sup>1</sup> ; (1) Kobe University, Kobe, Japan; (2) DENSO TEN Limited, Kobe, Japan.
1309	<b>“Analysis of Interference between Two LiDAR Sensors in Autonomous Driving Scenario”</b> , Parvez Alam, and Rajalakshmi Pachamuthu, Indian Institute of Technology Hyderabad, Hyderabad, India.
1228	<b>“Safe Roads: Traffic Management and Road Safety Platform for Smart Cities”</b> , Ana Almeida <sup>1</sup> , João Fonseca <sup>2</sup> , Pedro Rasinhas <sup>2</sup> , Catarina Costa <sup>2</sup> , Diogo Paiva <sup>2</sup> , Gonçalo Silva <sup>2</sup> , Pedro Rito <sup>1</sup> , and Susana Sargento <sup>1</sup> ; (1) Instituto de Telecomunicações, Aveiro, Portugal; (2) Universidade de Aveiro, Departamento de Electrónica, Telecomunicações e Informática, Aveiro, Portugal.
1136	<b>“Advancing Freight Train Integrity Monitoring for Next-Generation Railway Signaling Using UWB”</b> , Denis Mikhaylov, Fu Zheng, Philipp Mayer, Christian Vogt, Tommaso Polonelli, and Michele Magno; ETH Zürich, Zürich, Switzerland.

- **Applications and Use Cases: Smart Cities**

**Chair and Moderator**                      **Tiago Barros**, CESAR School, Recife, Brazil

**Papers**

1390	<b><i>“A Novel Machine Learning-based Approach to City Crime Sensor Placement Prediction”</i></b> Denis Nedeljkovic, Nadine Y. Fares, and Manar Jammal; York University, Toronto, Canada
1362	<b><i>“A Meta-graph Deep Learning Framework for Forecasting Air Pollutants using Heterogeneous Sensor Data”</i></b> , Zhiguo Zhang and Xiaoliang Ma; KTH Royal Institute of Technology, Stockholm, Sweden.
1216	<b><i>“Scalable and Interoperable Distributed Architecture for IoT in Smart Cities”</i></b> , VJS Pranavasri, Leo Francis, Ushasri Mogadali, Gaurav Pal, SVSLN Surya Suhas Vaddhiparthy, Anuradha Vatterem, Karthik Vaidhyanathan, and Deepak Gangadharan; IIIT, Hyderabad, India.
1165	<b><i>“Developing A Smart Home Surveillance System Using Autonomous Drones”</i></b> , Chongju Mai, and Anwar Haque; University of Western Ontario, London, Ontario, Canada.

## TECHNICAL SESSION-05 : TUESDAY OCTOBER 17TH, 2023. SMALL AUDITORIUM

16:30h – 18:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Applications and Use Cases: eHealth Services**

**Chair and Moderator**

**Ricardo Reis**, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

**Papers**

1204	<b><i>“WSN and IoT-based Real-Time Indoor Air Quality Monitoring System for Hospital Facilities”</i></b> , Britney Guañez Go <sup>1</sup> , Nicolo Diego Flores Genuino <sup>1</sup> , Aneya Alvarez Samson <sup>1</sup> , Richard E Hizon <sup>1</sup> , Jaybie A de Guzman <sup>1</sup> , Marc D. Rosales <sup>1</sup> , Joseph Gerard T. Reyes <sup>1</sup> , and Marian Fe Theresa C. Lomboy <sup>2</sup> ; (1) University of the Philippines – Diliman, Dilman, The Philippines; (2) University of the Philippines - Manila, Manila, The Philippines.
1183	<b><i>“A Smart Patient Initiated Controlled Analgesic Recording Dispenser (PICARD) for Prescription Abuse Prevention”</i></b> , Manuel Eduardo Segura <sup>1</sup> , Tianyi Hu <sup>2</sup> , Barbara Martinez Neda <sup>1</sup> , Linyi Xia <sup>1</sup> , Randy Wei <sup>3</sup> , Padma Gulur <sup>2</sup> , Solomon Liao <sup>1</sup> , G.P. Li <sup>1</sup> , and Sergio Gago-Masague <sup>1</sup> ; (1) University of California, Irvine, California, USA; (2) Duke University, Durham, North Carolina, USA; (3) Memorial Radiation Oncology Medical Group, Laguna Hills, California, USA.
1045	<b><i>“An Improved Lightweight DenseNet-201 Model for Pneumonia Detection on Edge IoT”</i></b> , Md. Bipul Hossain, Na Gong, and Mohamed Shaban; University of South Alabama, Mobile, Alabama, USA
1187	<b><i>“BMEye: Public Health-Oriented Body Mass Index Monitoring using Commodity WiFi”</i></b> , Kiran Davuluri <sup>1</sup> , Khairul Mottakin <sup>1</sup> , Zheng Song <sup>1</sup> , Jin Lu <sup>2</sup> , Mark Allison <sup>3</sup> , Kiran Davuluri <sup>1</sup> , Khairul Mottakin <sup>1</sup> , Zheng Song <sup>1</sup> , and Jin Lu <sup>2</sup> ; (1) University of Michigan-Dearborn, Dearborn, Michigan, USA; (2) University of Georgia, Athens, Georgia, USA; (3) University of Michigan-Flint, Flint, Michigan, USA.

- **Big data: Machine Learning and AI**

**Chair and Moderator**

**Ricardo Reis**, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

**Papers**

1168	<b><i>“Reinforcement Learning-Based Rate Adaptation for Point Cloud Streaming”</i></b> , Dominic Laniewski, and Nils Aschenbruck; Osnabrück University, Osnabrück, Germany.
1169	<b><i>“Towards a library of deep neural networks for experimenting with on-device training on microcontrollers”</i></b> , Soufiane Aatab, and Felix Freitag; Universitat Politècnica de Catalunya, Barcelona, Spain.
1132	<b><i>“A Game Theoretic Adversarial Synthetic Data Generation Method to Address Privacy Concerns in the Use of Deep Learning Models for IoT Applications”</i></b> , Abhijit Singh, and Biplab Sikdar; National University of Singapore, Singapore.
1091	<b><i>“An Artificial Intelligence based Optical Sensor for Microplastic Detection in Seawater”</i></b> , Gonzalo García-Valle, Javier Martínez-García, Aitor Jara, Francisco Javier Campoy, David Cecilia, Elena Torralba Calleja, Jordi Ricart, and Sergio Martínez-Navas; Leitat, Terrassa, Spain.

## TECHNICAL SESSION-06 : WEDNESDAY OCTOBER 18TH, 2023. SMALL AUDITORIUM

08:30h – 10:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Big Data: Machine Learning and AI**

**Chair and Moderator**

**João Gama**, INESC TEC, University of Porto, Porto, Portugal

**Papers**

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| 1087 | <b><i>“Development of IoT System for predicting Air/Water Quality with Spatiotemporal Datasets and Hybrid Models”</i></b> , Yoon Jungeun <sup>1</sup> , Yu Dasong <sup>1</sup> , Lee Youngjae <sup>2</sup> ; (1) Andong National University, Andong City, South Korea; (2) ETRI, Daejeon, South Korea. |
| 1210 | <b><i>“A Machine Learning Based Energy-Efficient Indoor Multiple IoT Device Tracking Algorithm Based on Correlated Group Determination”</i></b> , Alp Erel, Emre Molla, and Volkan Rodoplu; Yaşar University, Izmir, Turkey.   |
| 1298 | <b><i>“Machine Learning Enabled Sleep Time Estimation (MLE-STE) Architecture for Indoor Positioning in Energy-Efficient Mobile Internet of Things”</i></b> , Alper Saylam, Cuneyt Guzelis, and Volkan Rodoplu; Yaşar University, Izmir, Turkey.  |
| 1211 | <b><i>“Machine Learning Based Multipath Processing Architecture for Mobile IoT Indoor Positioning”</i></b> , Berke Kilinc, Berkay Habib, and Volkan Rodoplu; Yaşar University, Izmir, Turkey.  |

- **Big Data: Machine Learning and AI**

**Chair and Moderator**

**João Gama**, INESC TEC, University of Porto, Porto, Portugal

**Papers**

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| 1075 | <b><i>“Goat Feeding Behavior Modeling and Monitoring Utilizing Livestock Wearable Device and Machine Learning Algorithm”</i></b> , Melchizedek Alipio <sup>1</sup> , Gianne Marcus Obusan <sup>2</sup> , Julianne Abbe Ong <sup>2</sup> , |
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	Samuel Perez <sup>2</sup> , Anton Luis Garces <sup>2</sup> , and Miroslav Bures <sup>1</sup> ; (1) Czech Technical University in Prague, Prague, Czechia; (2) De La Salle University, Manila, The Philippines.
1195	<b>“Personalized Wireless Ad Hoc Federated Learning for Label Preference Skew”</b> , Ryusei Higuchi, Hiroshi Esaki, and Hideya Ochiai; The University of Tokyo, Tokyo, Japan.
1173	<b>“Tuning Vision Transformer with Device-to-Device Communication for Targeted Image Recognition”</b> , Hideya Ochiai, Atsuya Muramatsu, Yudai Ueda, Ryuhei Yamaguchi, Kazuhiro Katoh, and Hiroshi Esaki; The University of Tokyo, Tokyo, Japan.
1254	<b>“Improving Mobile Edge Computing Orchestration using Deep Reinforcement Learning through Environment Predictions”</b> , Eliana Neuza Silva, and Fernando Mira da Silva; Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal.

## TECHNICAL SESSION-07 : WEDNESDAY OCTOBER 18TH, 2023. SMALL AUDITORIUM

11:00h – 13:00h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Big Data: Federated Learning**

**Chair and Moderator**

**Konstantin Mikhaylov**, University of Oulu, Finland

**Papers**

1174	<b>“Wireless Ad-Hoc Federated Learning for Cooperative Map Creation and Localization Models”</b> , Yusuke Sugizaki, Hideya Ochiai, Muhammad Asad, Manabu Tsukada, and Hiroshi Esaki; The University of Tokyo, Tokyo, Japan.
1182	<b>“Wireless Decentralized Federated Learning with Energy-Constrained Clients”</b> , Sili Wu <sup>1</sup> , Sheng Shen <sup>1</sup> , Phee Lep Yeoh <sup>2</sup> , and Teng Joon Lim <sup>1</sup> ; (1) The University of Sydney, Sydney, Australia; (2) University of the Sunshine Coast, Sippy Downs, Queensland, Australia.
1354	<b>“Energy-Efficient Federated Learning-based Device Selection in IoT Environments”</b> , Alaa Al Zailaa, Hao Ran Chi, Ayman Radwan, and Rui Aguiar; Instituto de Telecomunicações and University of Aveiro, Aveiro, Portugal.
1112	<b>“Adversarial Predictions of Data Distributions Across Federated Internet-of-Things Devices”</b> , Samir Rajani <sup>1</sup> , Dario Dematties <sup>1</sup> , Nathaniel Hudson <sup>2</sup> , Kyle Chard <sup>2</sup> , Nicola Joy Ferrier <sup>3</sup> , Rajesh Sankaran <sup>3</sup> , and Peter Beckman <sup>3</sup> ; (1) Northwestern-Argonne Institute of Science and Engineering, Evanston, Illinois, USA; (2) University of Chicago, Chicago, Illinois, USA; (3) Argonne National Laboratory, Lemont, Illinois, USA.

- **Computing: Platforms**

**Chair and Moderator**

**Konstantin Mikhaylov**, University of Oulu, Finland

**Papers**

1243	<b><i>“A versatile emulator tool to evaluate the scalability of Edge architectures in IoT scenarios”</i></b> , Matheus L. Silva <sup>1</sup> , Hendrick Gonçalves <sup>1</sup> , Vinícius Meyer <sup>2</sup> , Fabiano P. Hessel <sup>1</sup> , Cesar De Rose <sup>1</sup> ; (1) Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, Brazil; (2) University of Taquari Valley (UNIVATES), Lajeado, Brazil.
1385	<b><i>“WTTTool: A Network Topology Generation and Visualization Platform”</i></b> , Nicholas D Accurso, Diptangshu De, Annoy Dey, Nicholas Stokes, and Filippo Malandra; SUNY University at Buffalo, Buffalo, New York, USA.
1221	<b><i>“Common Requirements for IoT Platforms”</i></b> , Tiago G F Barros, and Erico Souza Teixeira; CESAR School, Recife, Brazil.
1363	<b><i>“DeBaTE-FI: A Debugger-Based Fault Injector Infrastructure for IoT Soft Error Reliability Assessment”</i></b> , Alex Hanneman <sup>1</sup> , Jonas Gava <sup>2</sup> , Vitor Bandeira <sup>2</sup> , Rafael Garibotti <sup>3</sup> , Ricardo Reis <sup>2</sup> , and Luciano Ost <sup>1</sup> ; (1) Loughborough University, Loughborough, UK; (2) Universidad Federal de Río Grande del Sur- UFRGS, Porto Alegre, Brazil; (3) Vector Trading, Porto Alegre, Brazil.

## TECHNICAL SESSION-08 : WEDNESDAY OCTOBER 18TH, 2023. SMALL AUDITORIUM

16:30h – 18:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- Computing: Resource Management

Chair and Moderator

Stefan Wesner, University of Cologne, Köln-Lindenthal, Germany

Papers

1185	<b><i>“Context Driven MEC Resource Allocation for Time-Critical AR Applications”</i></b> , Savvas Ioannis Raptis, Iason Karakostas, Nikolaos Dimitriou, and Dimitrios Tzovaras; Centre for Research and Technology Hellas (CERTH), Marousi, Greece.
1089	<b><i>“A Comparative Analysis of Machine Learning Techniques for Enhanced Resource Management in Multi-access Edge Computing”</i></b> , Lucas Vinhal Pereira <sup>1</sup> , Rodrigo Moreira <sup>2</sup> , and Flávio de Oliveira Silva <sup>1</sup> ; (1) Federal University of Uberlândia (UFU), Uberlândia, Brazil; (2) Federal University of Viçosa (UFV), Viçosa, Brazil.
1163	<b><i>“Joint Scheduling of Communication and Computation Resources for Efficient Computation Offloading in MEC-based V2X Systems”</i></b> , Annu P. Rajalakshmi; IIT Hyderabad, Hyderabad, India.
1235	<b><i>“Software Architecture for Multi-User Multiplexing to Enhance Scalability in IoT-Based Remote Labs”</i></b> , Akshit Gureja, Rishabh Anup Agrawal, Sachin Chaudhari, Karthik Vaidhyanathan, and Venkatesh Choppella; International Institute Of Information Technology – IIT-H, Hyderabad, India.

- Computing: Algorithms

Chair and Moderator

Stefan Wesner, University of Cologne, Köln-Lindenthal, Germany

Papers



1080	<b>“Dynamic IoT Applications and Isomorphic IoT Systems Using WebAssembly”</b> , Kentaro Kuribayashi <sup>1</sup> , Yusuke Miyake <sup>1</sup> , Kenji Rikitake <sup>1</sup> , Kiyofumi Tanaka <sup>2</sup> , and Yoichi Shinoda <sup>2</sup> ; (1) GMO Pepabo, Inc., Tokyo Japan; (2) Japan Advanced Institute of Science and Technology, Ishikawa, Japan.
1093	<b>“Fine-grained traffic differentiation in tactile Internet scenarios using RINA”</b> , David Sarabia-Jácome, Eduard Grasa, and Marisa Catalán; Fundació i2CAT, Barcelona, Spain.
1134	<b>“Handling WSN Communication Faults at the Edge with Confidence Attribution for Data Imputation”</b> , Leonardo Passig Horstmann <sup>1</sup> , José Luis Conradi Hoffmann <sup>1</sup> , Roberto Milton Scheffel <sup>2</sup> , and Antônio Augusto Fröhlich <sup>1</sup> ; (1) Federal University of Santa Catarina, Florianópolis, Brazil; (2) Federal Technology University of Parana, Toledo, Brazil.
1053	<b>“Intelligent Tire Algorithm Enabling Simultaneous Detection of Loading and Wear Status of Truck and Bus Tires”</b> , Kenta Nishiyama, Shogo Takedomi, Yuta Machida, Akihiko Yokoo, Masako Kamiyama, Hiromitsu Ichikawa, and Teppei Mori; Bridgestone Corporation, Tokyo, Japan

## TECHNICAL SESSION-09: THURSDAY OCTOBER 19TH, 2023. SMALL AUDITORIUM

08:30h – 10:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Connectivity: Protocol Evaluation**

**Chair and Moderator**

**Peter Langendorfer**, IHP GmbH – Innovations for High Performance Microelectronics/ Leibniz-Institut für innovative Mikroelektronik, Frankfurt, Germany

**Papers**

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| 1164 | <b>“Distributed topology discovery in resource constrained IoT: a Directed Flooding approach”</b> , Sara Lotano <sup>1</sup> , and Alessandro Chiumento <sup>2</sup> ; (1) Università di Pisa, Pisa, Italy; (2) University of Twente, Enschede, The Netherlands.  |
| 1414 | <b>“Dynamic Sensitivity Control for Mitigating Hidden and Exposed Terminals in WiFi 7 Networks”</b> , Buddhi Gayashan Jayasekara <sup>1</sup> , Indika Anuradha Mendis Balapuwaduge <sup>2</sup> , Frank Yong Li <sup>2</sup> ; (1) University of Ruhuna, Matara, Sri Lanka; (2) University of Agder, Grimstad, Norway.   |
| 1197 | <b>“Improving LoRaWAN Fingerprint-based Localization by Detecting and Eliminating Noisy RSSI Measurements”</b> , Asma Haghighat <sup>1</sup> , Zahra Sirous <sup>1</sup> , Azin Moradbeikie <sup>2</sup> , Ahmad Keshavarz <sup>1</sup> , and Sergio Ivan Lopes <sup>2</sup> ; (1) Persian Gulf University, Bushehr, Iran; (2) CinTin - Centro de Interface Tecnológico Industrial, Inovarcos, Arcos de Valdevez, Portugal. |
| 1176 | <b>“An Efficient Routing Method using Packet Buffer Management in Wi-SUN FAN”</b> , Ryuichi Nagao, Hiroko Masaki, and Hiroshi Harada; Kyoto University, Kyoto, Japan.   |

- **Connectivity: Protocol Evaluation & Cognitive Networks**

**Chair and Moderator**

**Peter Langendorfer**, IHP GmbH – Innovations for High Performance Microelectronics/ Leibniz-Institut für innovative Mikroelektronik, Frankfurt, Germany

<b>Papers</b>	
<b>1203</b>	<i>“VarOLLA: Maximizing Throughput for 5G-RedCap Devices in IIoT Networks”</i> , Sabari Nathan Anbalagan, Alessandro Chiumento, Paul Havinga; University of Twente, Enschede, The Netherlands.
<b>1144</b>	<i>“SCHC over LoRaWAN, a Framework for Interoperable, Energy Efficient and Scalable Networks”</i> , Hussein Al Haj Hassan <sup>1</sup> , Ali Krayem <sup>2</sup> , Ivan Martinez <sup>3</sup> , Laurent Toutain <sup>4</sup> , and Alexander Pelov <sup>1</sup> ; (1) Acklio, Cesson-Sévigné, France; (2) American University of Science and Technology, Beirut, Lebanon; (3) Nokia Bell Labs, Massy, France; (4) IMT Atlantique, Rennes, France.
<b>1347</b>	<i>“Cooperative Awareness in Cognitive Wireless Networks for Jamming Control”</i> , André Chaves Mendes <sup>1</sup> , Diego Brandão <sup>2</sup> , and Miguel Diaz-Cacho Medina <sup>3</sup> ; (1) Polytechnic Institute of Bragança, Bragança, Portugal; (2) CEFET-RJ, Rio de Janeiro, Brazil; (3) Universidade de Vigo, Vigo, Spain.
<b>1238</b>	<i>“Cognitive Wireless Networks: Research, Applications, and Testbed”</i> , Kyle Christopher Watters, Edward J Coyle, Nicholas W Meyer, Rohith Nibhanupudi, Grant Reidy, Gaurav Garre, and Shreya Challa; Georgia Institute of Technology, Atlanta, Georgia, USA.

### TECHNICAL SESSION-10: THURSDAY OCTOBER 19TH, 2023. SMALL AUDITORIUM

11:00h – 13:00h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Connectivity: Low-layer Protocols**

**Chair and Moderator**

**Hung-Yu Wei**, National Taiwan University, Taipei City, Taiwan

<b>Papers</b>	
<b>1212</b>	<i>“Spreading Factor Allocation for Extension of End Device Lifetime in LoRaWAN”</i> , Shusuke Narieda <sup>1</sup> , and Takeo Fujii <sup>2</sup> ; (1) Mie University, Tsu, Mie, Japan; (2) The University of Electro-Communications, Tokyo, Japan.
<b>1369</b>	<i>“Weather-Aware LoRaWAN Channel Selection using Bandit Algorithms”</i> , Sangeeth Kumar; Amrita University, Amrita Vishwa Vidyapeetham, India.
<b>1108</b>	<i>“Super-large Coverage IEEE 802.15.4g-FSK-based Wireless IoT System in VHF-band”</i> , Jaeseok Lim, Keito Nakura, and Hiroshi Harada; Kyoto University, Kyoto, Japan.
<b>1315</b>	<i>“Performance Evaluation of IEEE 802.15.4 SUN OFDM in VHF-band for Super-large Coverage Communication Systems”</i> , Keito Nakura, Hiroko Masaki, and Hiroshi Harada; Kyoto University, Kyoto, Japan.

- **Connectivity: Network Architectures**

**Chair and Moderator**

**Hung-Yu Wei**, National Taiwan University, Taipei City, Taiwan

<b>Papers</b>	
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1106	<b><i>“A Combined MQTT 5.0 and DTN Architecture for Mobile Edge IoT Nodes”</i></b> , Vassilis Demiroglou <sup>1</sup> , Pietro Manzoni <sup>2</sup> , and Vassilis Tsaoussidis <sup>1</sup> ; (1) Democritus University of Thrace, Xanthi, Greece; (2) Universitat Politècnica de València, València, Spain.
1365	<b><i>“BalanceDN: Load-Balancing Allocation of Interest for Fast Discovery in Named Centric Networks”</i></b> , Murali Gunti, and Roberto RojaSession-Cessa; New Jersey Institute of Technology, Newark, New Jersey, USA.
1206	<b><i>“IoT Data Collection Over Dynamic Networks: A Performance Comparison of NDN, DTN and NoD”</i></b> , Vassilis Demiroglou, Michail Martinis, Dimitra Florou, and Vassilis Tsaoussidis; Democritus University of Thrace, Xanthi, Greece.
1270	<b><i>“Topology Optimization of Wireless Sensor Networks based on Full Interactive Distributed Reinforcement Learning”</i></b> , Wei Sun, Wenhao Wang, Qiyue Li, and Weitao Li; Hefei University of Technology, Hefei, China.

## TECHNICAL SESSION-11 : THURSDAY OCTOBER 19TH, 2023. SMALL AUDITORIUM

16:30h – 17:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- Sensors and Remote Detection

Chair and Moderator

Hiroshi Harada, Kyoto University, Japan

Papers

1224	<b><i>“mmID: High-Resolution mmWave Imaging for Human Identification”</i></b> , Sakila S. Jayaweera <sup>1</sup> , Sai Deepika Regani <sup>2</sup> , Yuqian Hu <sup>2</sup> , Beibei Wang <sup>2</sup> , and K.J. Ray Liu <sup>1,2</sup> ; (1) University of Maryland, College Park, Maryland, USA; (2) Origin Research, Rockville, Maryland, USA.
1225	<b><i>“Robust Proximity Detection using On-Device Gait Monitoring”</i></b> , Yuqian Hu, Guozhen Zhu, Beibei Wang, and K. J. Ray Liu; Origin Research, Rockville, Maryland, USA.
1076	<b><i>“Radar Signal Decomposition of Multi-Human Respiration Signs with Reduced Antenna Array”</i></b> , Jeong-Hoon Park, Jihye Ki, and Seong-Cheol Kim; Seoul National University, Seoul, South Korea.
1253	<b><i>“Towards the on-device Handwriting Trajectory Reconstruction of the Sensor Enhanced Pen”</i></b> , Alexey Serdyuk <sup>1</sup> , Fabian Kreß <sup>1</sup> , Micha Hiegler <sup>1</sup> , Tanja Harbaum <sup>1</sup> , Jürgen Becker <sup>1</sup> , Florent Imbert <sup>2</sup> , Eric Anquetil <sup>2</sup> , Yann Soullard <sup>2</sup> , Romain Tavenard <sup>2</sup> , Jens Barth <sup>3</sup> , Peter Kämpf <sup>3</sup> ; (1) Karlsruhe Institute of Technology, Karlsruhe, Germany; (2) Université de Rennes 2, Rennes, France; (3) STABLO International GmbH, Heroldsberg, Germany.

## TECHNICAL SESSION-12: FRIDAY OCTOBER 20TH , 2023. SMALL AUDITORIUM

08:30h – 10:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- Operation Technologies

<b>Chair and Moderator</b>	<b>Henry Leung</b> , University of Calgary, Canada
<b>Papers</b>	
<b>1188</b>	<b><i>“RobWoT: Generating Real-Time Digital Twin Simulations for the Robotic Web of Things”</i></b> , Fady Salama <sup>1</sup> , Zucheng Han <sup>1</sup> , Ege Korkan <sup>2</sup> , Sebastian Käbisch <sup>2</sup> , and Sebastian Steinhorst <sup>1</sup> ; (1) Technical University of Munich, Munich, Germany; (2) Siemens AG, Germany.
<b>1229</b>	<b><i>“Data Integration Framework for Virtual Reality Enabled Digital Twins”</i></b> , Florian Stadtmann, Hary Pirajan Mahalingam, and Adil Rasheed; Norwegian University of Science and Technology, Trondheim, Norway.
<b>1081</b>	<b><i>“Digital Twin for Grey Box modeling of Multistory residential building thermal dynamics”</i></b> , Lina Morkunaite <sup>1</sup> , Justas Kardoka <sup>1</sup> , Darius Pupeikis <sup>1</sup> , Paris Fokaidis <sup>2</sup> , and Vangelis Angelakis <sup>3</sup> ; (1) Kaunas University of Technology, Kaunas, Lithuania; (2) Frederick University, Nicosia, Cyprus; (3) Linköping University, Norrköping, Sweden.
<b>1084</b>	<b><i>“A survey about 5G-based robotics: implementations, possibilities and limitations”</i></b> , Lukas Portenschalger, Ulrich Pache, and Simon Kranzer; Salzburg University of Applied Sciences, Salzburg, Austria.
<ul style="list-style-type: none"> <li><b>Energy Efficiency</b></li> </ul>	
<b>Chair and Moderator</b>	<b>Henry Leung</b> , University of Calgary, Canada
<b>Papers</b>	
<b>1113</b>	<b><i>“InfiniteEn: A Multi-Source Energy Harvesting System with Load Monitoring Module for Batteryless Internet of Things”</i></b> , Priyesh Pappinisseri Puluckul, and Maarten Weyn; University of Antwerp-imec, Antwerp, Belgium.
<b>1098</b>	<b><i>“Stochastic Modeling for Performance and Availability Evaluation of Street Lighting Systems”</i></b> , Cleunio Bezerra de França Filho, Eric Borba, Thiago Valentim, Gustavo Callou, and Eduardo Tavares; Federal University of Pernambuco, Recife, Brazil.
<b>1067</b>	<b><i>“Energy Efficient Deep-Edge Computing through Hardware Machine Learning”</i></b> , George Kornaros, and Harry Koutsourelakis; Hellenic Mediterranean University, Iraklio, Greece.
<b>1312</b>	<b><i>“Eco-Friendly Intrusion Detection: Evaluating Energy Costs of Learning”</i></b> , Julio Camejo Corona, Mário Luís Pinto Antunes, and Rui Luís Andrade Aguiar; Instituto de Telecomunicações, Universidade de Aveiro, Aveiro, Portugal.
<p><b>TECHNICAL SESSION-13: FRIDAY OCTOBER 20TH , 2023. SMALL AUDITORIUM</b></p> <p><b>11:00h – 13:00h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)</b></p> <ul style="list-style-type: none"> <li><b>Security and Privacy: Applications Security</b></li> </ul>	
<b>Chair and Moderator</b>	<b>Ruei-Hau (Richard) Hsu</b> , National Sun Yat-sen University, Kaohsiung, Taiwan

<b>Papers</b>	
<b>1252</b>	<b>“Securing Tiny Transformer-based Computer Vision Models: Evaluating Real-World Patch Attacks”</b> , Andrea Mattei, Moritz Scherer, Cristian Cioflan, Michele Magno, and Luca Benini; ETH Zurich, Zurich, Switzerland.
<b>1105</b>	<b>“An Authorization Service supporting Dynamic Access Control in Manufacturing Systems”</b> , Ivan Radonjic, Enna Basic, Björn Leander, and Tijana Markovic; Mälardalen University, Västerås, Sweden.
<b>1140</b>	<b>“Calculating Business Impact Assessment of Cyber-Threats”</b> , Filipe Apolinário <sup>1</sup> , Diogo Alves <sup>1</sup> , Bernardo Pacheco <sup>1</sup> , Nelson Escravana <sup>1</sup> , and António Grilo <sup>2</sup> ; (1) INOV INESC INOVAÇÃO, Lisbon, Portugal; (2) INESC-ID, Lisbon, Portugal.
<b>1236</b>	<b>“Public Blockchain in Support of Transactive Energy Markets”</b> , Akin Eker, Theo Tryfonas, and George Oikonomou; University of Bristol, Bristol, UK.

- **Security and Privacy: Multi-layer Security**

<b>Chair and Moderator</b>	<b>Nelson Escravana</b> , INOV INESC INOVAÇÃO, Lisbon, Portugal
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<b>Papers</b>	
<b>1135</b>	<b>“Optimization of Lightweight Malware Detection Models For AIoT Devices”</b> , Felicia Lo <sup>1</sup> ; Shin-Ming Cheng <sup>1</sup> , and Rafael Kaliski <sup>2</sup> ; (1) National Taiwan University of Science and Technology, Taipei City, Taiwan ROC; (2) National Sun Yat-Sen University, Kaohsiung, Taiwan, ROC.
<b>1213</b>	<b>“HomeSniff : Enhancing Forensic Capabilities in Internet of Things Gateways”</b> , Antonio Boiano, Alessandro Enrico Cesare Redondi, and Matteo Cesana; Politecnico di Milano, Milan, Italy.
<b>1159</b>	<b>“Exploring Optimal Set of Features in Machine Learning for Improving IoT Multilayer Security”</b> , Badeea Mahmoud Alsukhni <sup>1</sup> , Soumya Kanti Manna <sup>1</sup> , Jugal Dave <sup>2</sup> , and Leishi Zhang <sup>1</sup> ; (1) Canterbury Christ Church University, Canterbury, UK; (2) Rashtriya Raksha University, Gujarat, India.
<b>1121</b>	<b>“Implications of Physical Fault Injections on Single Chip Motes”</b> , Sara Faour <sup>1</sup> , Malisa Vucinic <sup>1</sup> , Filip Maksimovic <sup>1</sup> , David C Burnett <sup>2</sup> , Kristofer Pister <sup>3</sup> , Thomas Watteyne <sup>1</sup> , and Paul Muhlethaler <sup>1</sup> ; (1) INRIA, Paris, France; (2) Portland State University, Portland, Oregon, USA; (3) University of California, Berkeley, California, USA.

## TECHNICAL SESSION-14 : FRIDAY OCTOBER 20TH , 2023. SMALL AUDITORIUM

16:30h – 17:30h WEDST (Western European Daylight Savings Time - Aveiro, Portugal)

- **Security and Privacy: Cryptography and Authentication**

<b>Chair and Moderator</b>	<b>Nelson Escravana</b> , INOV INESC INOVAÇÃO, Lisbon, Portugal
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<b>Papers</b>	
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1231	<b><i>“Improving an Ultra Lightweight AES for IoT Applications”</i></b> , Yuri Silva Vaz, Júlio Carlos Balzano de Mattos, and Rafael Iankowski Soares; Federal University of Pelotas – UFPel, Pelotas, Brazil.
1215	<b><i>“Evaluating cryptographic security requirements in IoT gateways”</i></b> , Eduardo Ferreira Felix <sup>1</sup> , Fernando Antonio Aires Lins <sup>2</sup> , Diego Ribeiro Gomes <sup>1</sup> , Obionor Oliveira Nóbrega <sup>2</sup> , Bruno Almeida de Jesus <sup>1</sup> , and Marco Vieira <sup>1</sup> ; (1) University of Coimbra, Coimbra, Portugal; (2) Federal Rural University of Pernambuco, Recife, Brazil.
1097	<b><i>“Constructing Low-Cost LED-LDR-Based Physical Unclonable Functions”</i></b> , Stavros G. Stavrinides <sup>1</sup> , Lydia Bush-Espinosa <sup>2</sup> , Carol de Benito <sup>2</sup> , Nikolaos Athanasios Anagnostopoulos <sup>3</sup> , Tolga Arul <sup>3</sup> , Stefan Katzenbeisser <sup>3</sup> , Christos Tjortjis <sup>4</sup> , and Rodrigo Picos <sup>2</sup> ; (1) International Hellenic University, Kavala, Greece; (2) Universitat de les Illes Balears, Palma, Spain; (3) University of Passau, Passau, Germany; (4) International Hellenic University, Thessaloniki, Greece.
1086	<b><i>“Re-identifying of LoRa Devices in an Actual Passive Packet Sniffer”</i></b> , Ahmed Abdelghany, Bernard Uguen, Christophe Moy, and Jérôme Le Masson; University of Rennes, Rennes, France.