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¹ New Mexico State University, United States; ² Saint Joseph's University, United States	

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¹Kansas State University, United States; ²Indian Institute of Technology Gandhinagar, India;
³Viking Analytics, Sweden; ⁴Indian Institute of Technology Madras, India

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Federal University of Rio Grande do Norte, Brazil

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University of Tsukuba, Japan

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JaeSeung Song, Sejong University

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University of Washington Bothell, United States

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Muhammad Omer Farooq
Carleton University, Canada

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Ebelechukwu Nwafor¹, Michael Robson¹, Habeeb Olufowobi²
¹Villanova University, United States; ²University of Texas Arlington, United States

Convolution Processing Unit Featuring Adaptive Precision using Dynamic Reconfiguration 592
David Cain, Omar Eldash, Kasem Khalil, Magdy Bayoumi
University of Louisiana at Lafayette, United States

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Kevin Shen Hoong Ong¹, Dusit Niyato¹, Chakchai So-In², Thomas Friedrichs³
¹Nanyang Technological University of Singapore, Singapore; ²Khon Kaen University, Thailand;
³Robert Bosch SEA Pte Ltd, Singapore

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Hans-Peter Bernhard, Silicon Austria Labs GmbH
Leander Hörmann, Linz Center of Mechatronics GmbH

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Julian Karoliny¹, Thomas Blazek¹, Fjolla Ademaj¹, Hans-Peter Bernhard^{1,2}, Andreas Springer²
¹Silicon Austria Labs GmbH, Austria; ²Johannes Kepler University Linz, Austria

A Review of Confidentiality Threats against Embedded Neural Network Models 610
Raphaël Joud^{1,2}, Pierre-Alain Moëllic^{1,2}, Rémi Bernhard^{1,2}, Jean-Baptiste Rigaud³
¹CEA Tech, France; ²CEA-Leti, France; ³Mines Saint-Etienne, France

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Mathieu Dumont^{1,2}, Pierre-Alain Moëllic^{1,2}, Raphael Viera³, Jean-Max Dutertre³, Rémi Bernhard^{1,2}
¹CEA Tech, France; ²CEA-Leti, France; ³Mines Saint-Etienne, France

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Jure Vreča^{1,2}, Iva Ivanov², Gregor Papa^{1,2}, Anton Biasizzo^{1,2}

¹Jožef Stefan Institute, Slovenia; ²Jožef Stefan International Postgraduate School, Slovenia

10:30 - 11:30

C2L-2: SPECIAL SESSION: AI-IIoT - The Future of Intelligent Industry 1

SESSION CHAIRS

Ahmed Hussein, Manhattan College

Sameh Sorour, Queen's University, Canada

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Zaghloul Saad Zaghloul, Nelly Elsayed, Chengcheng Li, Magdy Bayoumi

¹University of Cincinnati, United States; ²University of Louisiana at Lafayette, United States

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Hela Chamkhia¹, Abdullah Al-Ali¹, Amr Mohamed¹, Mohsen Guizani¹, Aiman Erbad², Ahmed Refaey⁰

¹Qatar University, Qatar; ²Hamad Bin Khalifa University, Qatar; ³Western University, Canada;

⁴Manhattan College, United States

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Afsaneh Gharouni¹, Peter M. Rost¹, Andreas Maeder¹, Hans D. Schotten²

¹Nokia Bell Labs, Germany; ²Technical University of Kaiserslautern, Germany

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Hung Cao¹, Monica Wachowicz², James Craig³

¹University of New Brunswick, Canada; ²RMIT University, Australia; ³Rimot.io Inc., Canada

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SESSION CHAIRS

William Hsu, Kansas State University

Bala Natarajan, Kansas State University

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Desilda Toska¹, Alfredo Pulla², Stefano Robustelli², Gianmarco Fiamma²

¹IBM CIC, Italy; ²IBM, Italy

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Abhijit Singh, Biplab Sikdar

National University of Singapore, Singapore

A Custom Unsupervised Approach for Pipe-Freeze Online Anomaly Detection 663

Ahmed Soliman¹, Sanguthevar Rajasekaran¹, Patrick Toman¹, Nalini Ravishanker¹, Nathan Lally², Hunter D'Addeo²

¹University of Connecticut, United States; ²Hartford Steam Boiler, United States

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Lassi Puurunen¹, Jatin Chaudhary², Rajeev Kanth³, Jukka Heikkonen²

¹University of Eastern Finland, Finland; ²University of Turku, Finland; ³Savonia University of Applied Sciences, Finland

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Yoga Suhas Kuruba Manjunath, Sihao Zhao, Xiao-Ping Zhang

Ryerson University, Canada

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JaeSeung Song, Sejong University

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Karlsruhe Institute of Technology, Germany

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Saibal Ghosh, Dharma P. Agrawal

University of Cincinnati, United States

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Saibal Ghosh, Dharma P. Agrawal

University of Cincinnati, United States

Energy Disaggregation with Federated and Transfer Learning 698

Qi Li¹, Jin Ye¹, Wenzhan Song¹, Zion Tse²

¹*University of Georgia, United States*; ²*University of York, United Kingdom*

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Mohammad Nazmus Sakib, Rahul Sreekumar, Vaibhav Verma, Tommy Tracy II, Mircea R. Stan

University of Virginia, United States

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SESSION CHAIRS

William Hsu, Kansas State University

Bala Natarajan, Kansas State University

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Gervionne Azizah S. Ferreras, Marc Caesar R. Talampas

University of the Philippines - Diliman, Philippines

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Sifatul Mostafi, Taghreed Alghamdi, Khalid Elgazzar

University of Ontario Institute of Technology, Canada

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Luana Gantert¹, Matteo Sammarco², Marcin Detyniecki², Miguel Elias M. Campista¹

¹*Universidade Federal do Rio de Janeiro, Brazil*; ²*AXA, France*

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H.M.C.M.B. Herath, N.M.P.M. Nishshanka, P.V.N.U. Madhumali, Subhodha Gunawardena

University of Ruhuna, Sri Lanka

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Juliane Regina de Oliveira^{1,2}, Eduardo R. de Lima², Larissa M. de Almeida³, Lucas Wanner¹

¹*University of Campinas, Brazil*; ²*Instituto de Pesquisas Eldorado, Brazil*; ³*Taesa S.A., Brazil*

11:30 - 12:00

C4L-2: Results from Experiments, Demonstrations & Trials, & Deployment Experiences 1

SESSION CHAIRS

Raul Muñoz, Centre Tecnològic de Telecomunicacions de Catalunya
Yassr Ismail, Southern University and A&M College

- Aero-Hydroponic Agriculture IoT System** 741
Henry C.K. Tang¹, Tiger Y.S. Cheng¹, Joe C.Y. Wong², Ray C.C. Cheung¹, Alan H.F. Lam¹
¹City University of Hong Kong, Hong Kong; ²Sengital Limited, Hong Kong
- Use Case of Building an Indoor Air Quality Monitoring System** 747
Rameez Raja Kureshi¹, Dhavalkumar Thakker¹, Bhupesh Kumar Mishra¹, Baseer Ahmed²
¹University of Bradford, United Kingdom; ²University of the West of Scotland, United Kingdom
- How Green Networking May Harm Your IoT Network: Impact of Transmit Power Reduction at Night on NB-IoT Performance** 753
Pascal Jörke, Christian Wietfeld
TU Dortmund University, Germany
- Statistical Characterization of Path-Loss for 900 MHz LoRa using a Bike-Share IoT Network** 759
Sebastián Eraso-Misnaza, Juan G. Eraso-Trejo, Darío F. Fajardo-Fajardo, Carlos A. Viteri-Mera
Universidad de Nariño, Colombia
- Ornithology Meets the IoT: Automatic Bird Identification, Census, and Localization** 765
Leonhard Brüggemann, Bertram Schütz, Nils Aschenbruck
Osnabrück University, Germany
- REAM: Revolutionary Environmental and Agricultural Monitoring System** 771
Yu Hong Yong, Yun Bei Choo, Kheng Hui Ng, Yiqi Tew, Wah Pheng Lee
Tunku Abdul Rahman University College, Malaysia

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Leander Hörmann, Linz Center of Mechatronics GmbH

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Ramiro Sámano-Robles
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- In-Tunnel Multi-Ray Analysis for LOS V2V Links with Multiple Antennas** 783
Miguel Gutiérrez Gaitán^{1,2,3}, Ramiro Sámano-Robles¹
¹CISTER Research Centre / ISEP, Portugal; ²CISTER Research Centre / FEUP, Politécnico do Porto;
³Universidade Andres Bello, Portugal
- Heart Watch: Dynamical Systems based Real Time Data Driven ECG Synthesis** 789
Ashutosh Simha, Suryansh Sharma, Sujay Narayana, R. Venkatesha Prasad
Delft University of Technology, Netherlands
- A First Step Towards Holistic Trustworthy Platoons** 795
Ali Shoker¹, Peter Moertl², Ramiro Sámano-Robles³
¹VORTEX CoLab, Portugal; ²V2C2, Austria; ³CISTER Research Centre / ISEP, Portugal

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Ahmed Hussein, Manhattan College, USA
Sameh Sorour, Queen's University

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Sherif Elbishlawi, Mohamed H. Abdelpakey, Mohamed S. Shehata
University of British Columbia, Canada

DETECTren: Vehicle Object Detection using Self-Supervised Learning based on Light-Weight Network for Low-Power Devices 807

Hans Fuhrmann, Anthony Boyko, Mohamed H. Abdelpakey, Mohamed S. Shehata
University of British Columbia, Canada

Device Synchronization for Fault Localization in Electrical Distribution Grids 812

Jacob Hunte, Hanan Lutfiyya, Anwar Haque
University of Western Ontario, Canada

12:00 - 12:30

C6L-1: Artificial Intelligence, Machine Learning, & Analytics 4

SESSION CHAIRS

William Hsu, Kansas State University
Bala Natarajan, Kansas State University

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Tapadhir Das¹, Raj Mani Shukla², Shamik Sengupta¹
¹*University of Nevada, Reno, United States;* ²*University of Bristol, United Kingdom*

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Tingting Hao^{1,2}
¹*Beijing-Dublin International College, China;* ²*Beijing University of Technology, China*

Dyn-ASR: Compact, Multilingual Speech Recognition via Spoken Language and Accent Identification 830

Sangeeta Manepalli¹, Daniel Whitenack², Joshua Nemecek²
¹*Intel Corporation, United States;* ²*SIL International, United States*

A Deep LSTM based Approach for Intrusion Detection IoT Devices Network in Smart Home 836

Sylvia Worlali Azumah, Nelly Elsayed, Victor Adewopo, Zaghoul Saad Zaghoul, Chengcheng Li
University of Cincinnati, United States

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Anatolii Kargin, Tetyana Petrenko
Ukrainian State Railway Academy, Ukraine

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Hazem Younis, John H.L. Hansen
The University of Texas at Dallas, United States

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Yassr Ismail, Southern University and A&M College

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Mee Sim Lai¹, Say Chuan Tan¹, Sangeeta G. Manepalli², Rizwan Hirani¹, Evan Qiu³, Kok Fatt Chan⁴

¹Intel Microelectronics M Sdn Bhd, Malaysia; ²Intel Corporation, United States; ³Intel China Ltd., China;

⁴Intel Deutschland GmbH, Germany

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Mohit Taneja^{1,2}, Nikita Jalodia¹, Paul Malone¹, Eyal Misha³

¹Waterford Institute of Technology, Ireland; ²SFI VistaMilk Research Centre, Ireland; ³ENGS Systems, Israel

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Diego Suárez-Bagnasco^{1,2}

¹Ministry of Industry, Energy and Mining of Uruguay, Uruguay; ²Omnia, Uruguay

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Chao Zhang¹, Chenguang Lu², Xuejun Cai², Gyanesh Patra², Per Ödling¹

¹Lund University, Sweden; ²Ericsson Research, Sweden

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Sai Usha Nagasri Goparaju, SVSLN Surya Suhas Vaddhiparthi, Pradeep C., Anuradha Vattam, Deepak Gangadharan

International Institute of Information Technology Hyderabad, India

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10:30 - 11:15

D1L-1: Demonstrations 1

SESSION CHAIRS

Mahmoud Darwich, Bloomsburg University of Pennsylvania
Ahmed Abdelgawad, Central Michigan University

TinyML Benchmark: Executing Fully Connected Neural Networks on Commodity Microcontrollers 883

Bharath Sudharsan¹, Simone Salerno¹, Duc-Duy Nguyen¹, Muhammad Yahya¹, Abdul Wahid¹, Piyush Yadav¹, John G. Breslin¹, Muhammad Intizar²

¹Data Science Institute, NUI Galway, Ireland; ²Dublin City University, Ireland

10:30 - 12:30

D2L-1: SPECIAL SESSION: IoT for Emergency Response & Disaster Recovery

SESSION CHAIRS

Niranjan Suri, US Army Research Laboratory and Florida Institute for Human and Machine Cognition
Konrad Wrona, NATO Communications and Information Agency, The Netherlands, and
Military University of Technology

LoRaWAN Testing for Military Communications in Urban Environments 885

James Michaelis¹, Alessandro Morelli², Luis Hernandez¹, Deryck James¹, Jade Freeman¹, Niranjan Suri¹

¹U.S. Army Research Laboratory, United States; ²Institute of Human and Machine Cognition, United States

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Tallinn University of Technology, Estonia

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¹ Military University of Technology, Poland; ² NCI Agency / Military University of Technology, Netherlands	
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Ragini Gupta ¹ , Klara Nahrstedt ¹ , Niranjani Suri ² , Jeffrey Smith ²	
¹ University of Illinois at Urbana-Champaign, United States; ² U.S. Army Research Laboratory, United States	

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Mahmoud Darwich, Bloomsburg University of Pennsylvania
Ahmed Abdelgawad, Central Michigan University

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<i>University of Turku, Finland</i>	
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<i>Central Michigan University, United States</i>	

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<i>NEC Laboratories Europe, Germany</i>	
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<i>University of Oulu, Finland</i>	
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<i>Beckage, United States</i>	
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Hen-Geul Yeh ¹ , Donald C.D. Chang ²	
¹ California State University Long Beach, United States; ² Spatial Digital Systems, Inc., United States	
Energy-Efficient Distributed Machine Learning in Cloud Fog Networks	935
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