

Central European Time (CET)	August 1	August 2	August 3		
9:00 AM - 9:15 AM					
9:15 AM - 9:30 AM	Registration	Session 7	Session 11		
9:30 AM - 9:45 AM				Session 8	Session 12 (Virtual)
9:45 AM - 10:00 AM	Opening (Room 1)				
10:00 AM - 10:15 AM	Keynote 1 (In-Person Room 1)				
10:15 AM - 10:30 AM	Coffee Break		Coffee Break		
10:30 AM - 10:45 AM	Coffee Break		Coffee Break		
10:45 AM - 11:00 AM	Session 1	Panel: Diversity & Inclusion (In-Person)	Session 14		
11:00 AM - 11:15 AM				Tutorial 1 (Virtual)	Session 15
11:15 AM - 11:30 AM		Session 2 (Virtual)	Session 16 (Virtual)		
11:30 AM - 11:45 AM				Session 3 (Virtual)	Awards & Closing (Room 1)
11:45 AM - 12:00 PM		Break & Lunch			
12:00 PM - 12:15 PM		Break & Lunch			
12:15 PM - 12:30 PM	Break & Lunch				
12:30 PM - 12:45 PM	Break & Lunch				
12:45 PM - 1:00 PM	Break & Lunch				
1:00 PM - 1:15 PM	Break & Lunch				
1:15 PM - 1:30 PM	Break & Lunch				
1:30 PM - 1:45 PM	Break & Lunch				
1:45 PM - 2:00 PM	Break & Lunch				
2:00 PM - 2:15 PM	Break & Lunch				
2:15 PM - 2:30 PM	Break & Lunch				
2:30 PM - 2:45 PM	Keynote 2 (Virtual Room 1)	Keynote 3 (Virtual Room 1)			
2:45 PM - 3:00 PM	Coffee Break				
3:00 PM - 3:15 PM	Coffee Break				
3:15 PM - 3:30 PM	Session 4	Tutorial 2	Session 10 (Virtual)		
3:30 PM - 3:45 PM				Tutorial 3 (Virtual)	
3:45 PM - 4:00 PM					Session 5 (Virtual)
4:00 PM - 4:15 PM		Session 6 (Virtual)			
4:15 PM - 4:30 PM					
4:30 PM - 4:45 PM					
4:45 PM - 5:00 PM					
5:00 PM - 5:15 PM					
5:15 PM - 5:30 PM					
5:30 PM - 5:45 PM					
5:45 PM - 6:00 PM					
6:00 PM - 6:15 PM					

Room 1
Room 2
Room 3



Session #	Authors	Title	Type	Style
1	Fabian Kovac, Oliver Eigner, Alexander Adrowitzer, Hubert Schönlast and Alexander Buchelt	Classification of rain events using directional radio data of commercial microwave links	In-Person	(Long)
	Jan Krummenauer, Nesrine Kammoun, Benedikt Stein and Jürgen Götzke	Encoding categorical variables in physics-informed graphs for Bayesian Optimization	In-Person	(Long)
	Koki Fujita, Shugo Fujimura, Yuwei Sun, Hiroshi Esaki and Hideya Ochiai	Federated Reinforcement Learning for the Building Facilities	In-Person	(Long)
	Habib Irani, Fatemeh Elahi, Mahmood Fazlali, Mahyar Shahsavari and Bahar Farahani	Auto-tuning HyperParameters of SGD Matrix Factorization-Based Recommender Systems Using Genetic Algorithm	In-Person	(Long)
4	Andres Gomez	The case for a batteryless Internet of Things	In-Person	Mini-Keynote
	Monerah Al-Mekhlai, Abdulrahman Alyahya, Abdullah Aldhamin and Azmath Khan	Network Automation Python-based Application: The performance of a Multi-Layer Cloud Based Solution	In-Person	(Long)
	Thomas Becnel, Kerry Kelly and Pierre-Emmanuel Gaillardon	Tiny Time-Series Transformers: Realtime Multi-Target Sensor Inference At The Edge	In-Person	(Long)
	Georgios Tertytchny and Maria K.Michael	Two-dimensional Dataset Reduction in Data-Driven Fault Detection for IoT-based Cyber Physical Systems	In-Person	(Long)
7	Zouheir Trabelsi, Tariq Qayyum, Kadhim Hayawi and Muhammad Ali	Global Aggregation Node Selection Scheme in Federated Learning for Vehicular Ad Hoc Networks (VANETs)	In-Person	(Long)
	George Roufis, Marios Paraskevopoulos, Ioannis Vetsikas, Ioanna Roussaki, Dimitris Stavrakoudis and Dimitrios Katsantonis	Data-Driven and Interoperable Smart Agriculture: An IoT-based Use-Case for Arable Crops	In-Person	(Long)
	Szymon Mueller, Marcin Plociennik, Maciej Zacharczuk, Adam Fojud, Michal Blaszcak, Alicja Laskowska, Raul Palma, Magdalena Jakubowska and Andrzej Wojtowicz	Leveraging IoT Solutions as a base for development of the agriculture advisory services	In-Person	(Long)
	Stevan Cakic, Tomo Popovic, Srdjan Krco, Daliborka Nedjc and Dejan Babic	Developing Object Detection Models for Camera Applications in Smart Poultry Farms	In-Person	(Short)
8	Sune Chung Jepsen, Torben Worm and Eunsuk Kang	Reconfigurability For Industry 4.0 Middleware Software Architectures	In-Person	(Long)
	Markus Sauer, Andreas Dachsberger, Leonard Gighuber and Lukasz Zalewski	Decentralized Deadlock Prevention for Self-Organizing Industrial Mobile Robot Fleets	In-Person	(Short)
	Gokul Chinnappan and Bharadwaj Veeravalli	Time and Energy trade-off analysis for Multi-Installment Scheduling with result retrieval strategy for Large Scale data processing	In-Person	(Long)
	Gerezher Adhane, Mohamad Mahdi Dehshibi and David Masip	Incorporating Reinforcement Learning for Quality-aware Sample Selection in Deep Architecture Training	In-Person	(Long)
11	Khaled Sidahmed Sidahmed Alamin, Yukai Chen, Enrico Macii, Massimo Poncino and Sara Vinco	A Machine Learning-based Digital Twin for Electric Vehicle Battery Modeling	In-Person	(Long)
	Jose Maria Moyano Murillo, Jose Maria Luna Ariza and Sebastian Ventura Soto	Improving the Performance of Multi-Label Classifiers via Label Space Reduction	In-Person	(Long)
	Giulia Rafaiani, Paolo Santini, Marco Baldi and Franco Chiaraluce	Implementation of Ethereum Accounts and Transactions on Embedded IoT Devices	In-Person	(Long)
	Alpesh Bhudia, Anna Cartwright, Edward Cartwright, Julio Hernandez-Castro and Darren Hurley-Smith	Extortion of a Staking Pool in a Proof-of-Stake Consensus Mechanism	In-Person	(Long)
14	Asma Channa, Giuseppe Ruggeri, Nadia Mammone, Rares Cristian Ifrim, Antonio Iera and Nirvana Popescu	Parkinson's Disease Severity Estimation using Deep Learning and Cloud Technology	In-Person	(Short)
	Shugo Fujimura, Koki Fujita, Yuwei Sun, Hiroshi Esaki and Hideya Ochiai	A Flexible Distributed Building Simulator for Federated Reinforcement Learning	In-Person	(Short)
	Flavio Ponzina, Miguel Peón-Quiros, Giovanni Ansaloni and David Aitzena	An Accuracy-Driven Compression Methodology to Derive Efficient Codebook-Based CNNs	In-Person	(Long)
	Xuening Dong, Amirali Amirsoleimani, Mostafa Rahimi Azghadi and Roman Genov	In-Memory Memristive Transformation Stage of Gaussian Random Number Generator	In-Person	(Short)
15	Teresa Serrano Gotarredona, Farnaz Faramarzi and Bernabe Linares-Barranco	Electronically Foveated Dynamic Vision Sensor	In-Person	(Short)
	Ahmed Alqattaa, Daniel Loebenberger and Lukas Moeges	Analyzing the Latency of QUIC over an IoT Gateway	In-Person	(Short)
	Eduardo Pérez and Sebastián Ventura	Multi-view Deep Neural Networks for multiclass skin lesion diagnosis	In-Person	(Long)
	Maxime Méré, Frédéric Jouault, Loïc Pallardy and Richard Perdriau	Trustworthy SoC Reconfiguration Aimed at Product-Service Systems: a Literature Review	In-Person	(Long)
2	Artem Barger, Olga Ilina, Alexander Zemtsov and Ksenia Tagirova	Trustful Charity Foundation platform based on Hyperledger Fabric.	In-Person	(Short)
	Rasool Seyghaly, Jordi Garcia, Xavi Masip-Bruin and Mohammad Mahmoodi Varnamkhasli	Interference Recognition for Fog Enabled IoT Architecture using a Novel Tree-based Machine Learning Method	In-Person	(Short)
	Shamma Al Blooshi and Kyusuk Han	A Study on Employing UPTANE for Secure Software Update OTA in Drone Environments	In-Person	(Long)
	Kristián Košťál and Richard Marko	Management of Decentralized Autonomous Organizations	Virtual	(Long)
3	Joan Arnedo-Moreno and Victor Garcia-Font	Research opportunities in the application of blockchain in video games: A scoping review	Virtual	(Short)
	Bartosz Kusmierz and Roman Overko	How centralized is decentralized? Comparison of wealth distribution in coins and tokens	Virtual	(Short)
	Malcolm Smith, Alexander Castro, Mohamed Rahouti, Moussa Ayyash and Lesther Santana	ScreenCoin: A Blockchain-Enabled Decentralized Ad Network	Virtual	(Short)
	Alia Al Sadawi and Malick Ndiaye	A Comprehensive Blockchain Framework for (COVID-19)Vaccine Program Registration, Supply Chain and Side Effects	Virtual	(Short)
5	Kengo Watanabe and Fumio Machida	Availability Analysis of a Drone System with Proactive Offloading for Software Life-extension	Virtual	(Long)
	PI-Chung Wang	Packet Classification with Segregated Cross-Producing	Virtual	(Long)
	Dominik Weikert, Christoph Steup and Sanaz Mostaghim	Multi-Objective Task Allocation for Dynamic IoT Networks	Virtual	(Long)
	Saidur Rahman, Apostolos Kalatzis, Mike Wittie, David Millman and Laura Stanley	Dynamic Checkpoint Initiation in Serverless MEC	Virtual	(Short)
6	Eunsook Eunah Kim, Maurizio Rossi, Betty Cortiñas Lorenzo, Babis Magoutas, Cédric Crettaz, Andrea Fernández Martínez, Efthimios Bothos and Juan Manuel Fernández Montenegro	Water Economy with Smart Water System in the City of Carouge	Virtual	(Short)
	Rohit Gangupantulu, Tyler Cody, Paul Park, Abdul Rahman, Logan Eisenbeiser, Dan Radcke, Ryan Clark and Christopher Redino	Using Cyber Terrain in Reinforcement Learning for Penetration Testing	Virtual	(Long)
	Kumar Saurabh, Ayush Singh, Uphar Singh, O.P. Vyas and Rahamatullah Khondoker	GANIBOT: A Network Flow Based Semi Supervised Generative Adversarial Networks Model for IoT Botnets Detection	Virtual	(Short)
	Jyothish J. Kumar, Amish Bibhu, Shreya Shivangi, Subhankar Mishra and Sulagna Saha	MIMA - Multifunctional IoT integrated Menstrual Aid	Virtual	(Short)
6	Javier Gálvez-Goicuría, Josué Pagán, Lucía Pérez, Julián Catalina-Gómez, José M. Moya and José L. Ayala	Reproducible and accurate subject-wise sleep posture detection by detecting and removing turns	Virtual	(Short)
	Naga Durga Krishna Mohan Eaty and Priyanka Bagade	Electric Vehicle Battery Management using Digital Twin	Virtual	(Short)
	Daive Martintoni, Valerio Senni, Ernesto Gomez Marin and Antonio Javier Cabrera Gutierrez	Sensitive information protection in blockchain-based supply-chain management for aerospace	Virtual	(Long)
	Tyler Cody, Stephen Adams, Peter Beiling and Laura Freeman	On Valuing the Impact of Machine Learning Faults to Cyber-Physical Production Systems	Virtual	(Long)
6	Tej Kiran Boppana and Priyanka Bagade	Security risks in MQTT-based Industrial IoT Applications	Virtual	(Short)
	Purboday Ghosh, Hao Tu, Timothy Krentz, Gabor Karsai and Srdjan Lucic	An Automated Deployment and Testing Framework for Resilient Distributed Smart Grid Applications	Virtual	(Short)

	Elisavet Grigoriou, Manolis Fountoulakis, Emmanouil Kafetzakis, Ioannis Giannoulakis, Eleftherios Fountoukidis, Paris Alexandros Karypidis, Dimitrios Margounakis, Cleo Varianou Mikelidou, Iasonas Sennakis and George Boustras	Towards the RESPOND-A initiative: Next-generation equipment tools and mission-critical strategies for First Responders	Virtual	(Short)
9	Carmine Stefano Clemente, Daniele Davino, Immacolato Iannone and Vincenzo Paolo Loschiavo	A real-time Arduino based AC-DC Boost converter for Vibration Energy Harvesting devices	Virtual	(Long)
	Ludmila Grzelak, Alexis Lasserre, Olivier Brousse, Jérôme Rossignon, Didier Stuerger and Michel Paindavoine	Towards real-time ammonia concentration measurement using a microwave gas sensor associated with machine learning models	Virtual	(Long)
	Daniel Flood, Neethu Robinson and Shanker Shreejith	FPGA-based Deep-Learning Accelerators for Energy Efficient Motor Imagery EEG classification	Virtual	(Long)
	Alejandra Sanchez-Flores, Lluc Alvarez and Bartomeu Alorda	A review of CNN accelerators for embedded systems based on RISC-V	Virtual	(Long)
10	Laurent Yves Emile Ramos Cheret and Thiago Eustaquio Alves de Oliveira	Encoding High-Level Features: An Approach To Robust Transfer Learning	Virtual	(Long)
	Dejan Babic, Ivan Jovovic, Tomo Popovic, Stevan Cakic and Luka Filipovic	Detecting Pneumonia With TensorFlow and Convolutional Neural Networks	Virtual	(Long)
	Johannes Wirth and René Peinl	Automatic Speech Recognition in German: A Detailed Error Analysis	Virtual	(Long)
	Joe Lorentz, Assaad Moawad, Thomas Hartmann and Djamilia Aouada	Profiling the real world potential of neural network compression	Virtual	(Long)
	Marco Antonio Barron, Jose Maria Luna and Sebastián Ventura	Dynamic Airline Discounts using an Evolutionary Subgroup Discovery Methodology	Virtual	(Long)
12	Sonia Bilbao-Arechabala and Belen Martinez-Rodriguez	A practical approach to cross-agri-domain interoperability and integration	Virtual	(Long)
	Dominik Walczuch, Tim Nitzsche, Tim Seidel and Julius Schöning	Overview of Closed-Loop Control Systems and Artificial Intelligence Utilization in Greenhouse Farming	Virtual	(Short)
	Arkadiusz Radziuk, Grzegorz Gryziak, Juliusz Pukacki, Wieslaw Podyma, Kazimierz Wilk, Michał Błaszczak and Jerzy H. Czembor	IoT based solution for seed collection management of genebank	Virtual	(Short)
	Brian Reily, Caden Coniff, John G. Rogers and Christopher Reardon	Disruption of Connectivity Graphs in Uncertain Multi-Agent Systems	Virtual	(Long)
13	Laura Hernández-Lorenzo, Íñigo Sanz Ilundain and Jose Luis Ayala Rodrigo	Timeseries biomarkers clustering for Alzheimer's Disease progression	Virtual	(Long)
	Hiran Lowe, Minul Lamahehwege and Kutlila Gunasekera	Towards a Low-cost WiFi based Real-time Human Activity Recognition System	Virtual	(Long)
	Petros Vavaroutsos, Ioannis Oroutzoglou, Dimosthenis Masouros and Dimitrios Soudris	Towards making the most of NLP-based device mapping optimization for OpenCL kernels	Virtual	(Long)
	Pierrick Pochelu, Serge G. Petiton and Bruno Conche	Distributed Ensembles of Reinforcement Learning Agents for Electricity Control	Virtual	(Long)
	Partha Mukherjee and Youakim Badr	Detection of Defaulters in P2P Lending Platforms using Unsupervised Learning	Virtual	(Short)
16	Marcel Koch, Fabian Schlenke, Fabian Kohlmorgen, Markus Kuller, Jörg Bauer and Hendrik Wöhrlé	Detection and Classification of Human Activities using Distributed Sensing of Environmental Vibrations	Virtual	(Short)
	Leila Ismail and Huned Materwala	From Conception to Deployment: Intelligent Stroke Prediction Framework using Machine Learning	Virtual	(Short)
	Yar Muhammad, Mian Ahmad Jan, Spyridon Mastorakis and Bakht Zada	A Deep Learning-Based Smart Assistive Framework for Visually Impaired People	Virtual	(Long)

Keynote: Co-Designing Privacy-Preserving Medical Wearables in the IoT Era



Prof. David Atienza Alonso

Embedded Systems Lab. (ESL), EPFL,
Switzerland

August 1, 2022

The Internet of Things (IoT) has been hailed as the next frontier of innovation in which our everyday objects are connected in ways that can improve our daily lives and transform healthcare. However, significant challenges remain in achieving this potential due to the inherent resource-constrained and high-precision nature of medical wearables, coupled with privacy restrictions that prevent broad data gathering for Big Data studies in medical applications. This combination can result in inaccurate medical wearables in the IoT era. In this talk, Prof. Atienza will first discuss the challenges of designing edge Artificial Intelligence (AI) wearables in the IoT era. Then, it will be discussed how to co-design the next generation of medical wearables exploiting heterogeneous edge AI architecture to execute different ML algorithms. Moreover, it will be shown how the inclusion of federated learning can overcome the restrictions of medical data sharing with the Cloud, while enabling wearables personalization.

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Biography of Prof. David Atienza

David Atienza is a Full Professor of Electrical and Computer Engineering and leads the Embedded Systems Laboratory (ESL) at EPFL, Switzerland. He received his MSc and PhD degrees in Computer Science and Engineering from UCM (Spain) and IMEC (Belgium). His research interests focus on system-level design methodologies for energy-efficient multi-processor system-on-chip architectures (MPSoC) and next-generation smart embedded systems (particularly wearables) for the Internet of Things (IoT) era. In these fields, he is co-author of more than 350 publications, 12 patents, and received several best paper awards in top conferences. He also was the Technical Program Chair of DATE 2015 and General Chair of DATE 2017. Dr. Atienza received the DAC Under-40 Innovators Award in 2018, IEEE TCCPS Mid-Career Award in 2018, an ERC Consolidator Grant in 2016, the IEEE CEDA Early Career Award in 2013, the ACM SIGDA Outstanding New Faculty Award in 2012, and a Faculty Award from Sun Labs at Oracle in 2011. He is an IEEE Fellow and an ACM Distinguished Member, as well as Chair of EDAA for the period 2022-2023.

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Keynote: IoT for Smart and Connected Health



Prof. Honggang Wang

Editor-in-Chief of IEEE Internet of Things

Director of Internet of Things and Data Engineering Lab, UMass Dartmouth, USA

August 1, 2022

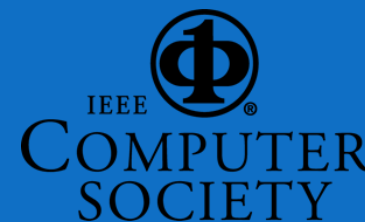
Dr. Honggang Wang is a professor and the “Scholar of The Year” (2016). Before he joined UMass Dartmouth in 2009, he worked for Bell Labs Lucent Technologies China from 2001 to 2004 as a Member of the Technical Staff and received Lucent Global Switching Software Silver Award, in Naperville IL, USA, 2002. He received his Ph.D. in Computer Engineering at the University of Nebraska-Lincoln in 2009. He was early promoted to a full professor at UMassD in 2020. He is an alumnus of NAE Frontiers of Engineering program. He has graduated 30 MS/Ph.D. students and produced high-quality publications in prestigious journals and conferences in his research areas, winning several prestigious best paper awards. His research interests include Internet of Things and their applications in health and transportation (e.g., autonomous vehicles) domains, Machine Learning and Big Data, Multimedia and Cyber Security, Smart and Connected Health, Wireless Networks and Multimedia Communications. His research is reported by media such as USA ABC 6 TV, Standard Times Newspaper. He is an IEEE distinguished lecturer and an IEEE Fellow with the citation “for contribution to low power wireless for IoT and multimedia applications”. He has also been serving as the Editor in Chief (EiC) for IEEE Internet of Things Journal (5 Year Impact Factor: 11.7) since 2020. He was the past Chair (2018-2020) of IEEE Multimedia Communications Technical Committee and is the IEEE eHealth Technical Committee Chair (2020-2021).

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Panel 1: Navigating the Tech. Industry as a Woman: Insights, Experience, and Lessons Learned from Leading Women in Tech.

This panel will provide a platform for our guests in which tech leaders as women or advocates for women in technology will provide insight into their experiences and share their perspectives. The panelists will highlight the stories and experiences about their successes and challenges in the tech industry, providing opportunities for women in tech to relate to one another and creating an open dialogue about the central role of skills (e.g., practical skills, technical skills, and entrepreneurial skills), career, and relationship building. This holistic panel will also address some of the key questions many women have regarding navigating the tech space, career development, and growth in the fields of IoT/AI/Data.

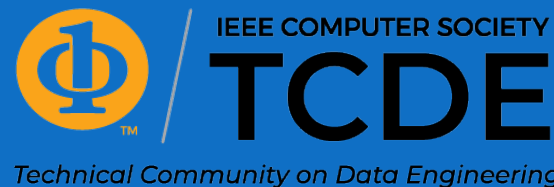
August 2, 2022



Panel 2: Designing for Diversity and Inclusion

Although the convergence of IoT, AI, Data, Edge-Fog-Cloud Computing, and Blockchain provides one of the most significant opportunities for humanity, the corresponding products/services/devices are typically not designed with the diversity of their users base in mind. This panel will discuss and establish strategies to foster genuine and holistic inclusion regarding design for these important technologies capturing the world's complex cultural and environmental diversity factors to tackle the risk of abuse and imbalance.

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Tutorial: Efficient Deep Learning Computing with Sparsity



Prof. Song Han

MIT, USA

August 2, 2022

Modern deep learning requires a massive amount of computational resources, carbon footprint, and engineering efforts, making on-device machine learning challenging; retraining the model on-device is even more difficult. We make machine learning efficient by utilizing sparsity. We'll first present neural architecture search techniques by sparsely sampling different paths (proxlessNAS), searching sparsely activated subnet works from the once-for-all network (OFA), and MCUNet that brings AI to micro-controllers. Then I'll describe TinyTL and on-device transfer learning with sparse layer, sparse tensor update, fitting 256KB memory. Next I'll talk about improving the efficiency by utilizing the temporal sparsity for videos, spatial sparsity for point cloud, and token level sparsity for NLP. I'll conclude by hardware and system support for sparsity (TorchSparse, SpAtten, SpArch, PointAcc). The presentation will highlight full-stack optimizations, including the neural network topology, inference library, and the hardware architecture, which allows a larger design space to unearth the underlying principles for sparsity.

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Biography of Prof. Song Han

Song Han is an associate professor in MIT EECS. His research focuses on efficient deep learning computing. He has proposed “deep compression” as a way to reduce neural network size by an order of magnitude, and the hardware implementation “efficient inference engine” that first exploited model compression and weight sparsity in deep learning accelerators. He has received best paper awards at ICLR’16 and FPGA’17. He is also a recipient of an NSF Career Award and MIT Tech Review's 35 Innovators Under 35 award. Many of his pruning, compression, and acceleration techniques have been integrated into commercial artificial intelligence chips. He earned a PhD in electrical engineering from Stanford University.

Tutorial: How to deploy productively QKeras deeply quantized networks on tiny micro-controllers



Danilo Pau, PhD

Technical Director, IEEE & ST Fellow -
System Research and Applications
STMicroelectronics, Italy

August 2, 2022

Tiny machine learning is a well-established topic since few years and the associated community is growing at fast pace. Deep learning frameworks like Keras and exporting procedure into TensorFlow Lite format are well known and used by many IoT practitioners who are looking to advancements in term of interoperability, automatization and productivity.

Established recently, Deeply Quantized Neural Networks (DQNNs) offer new opportunities and interesting advantages to save memory footprint and to enable cheap hardwired implementations. However, their efficient software implementation on off the shelf micro controller is still a challenge and an obvious benchmark is the TensorFlow Lite counter implementation of neural networks.

X-CUBE-AI is an STM32CubeMX Expansion Package capable of automatic conversion of pre-trained Neural Network and classical Machine Learning models, and integration of generated optimized Ansi C library into the user's project.

The attendees to this training will learn more about tinyML, QKeras deep learning framework and associated quantization capabilities. Moreover, they will learn how to design exemplary neural topologies to address some case studies encompassing image classification, electric current classification, anomaly detection and classifications. Furthermore, these neural networks will be deployed automatically on STM32 microcontrollers by using latest X-CUBE-AI version.

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Biography of Prof. Song Han

Danilo PAU (h-index 24, i10-index 58) graduated on 1992 from Politecnico di Milano, Italy. One year before, he joined STMicroelectronics, where he worked on HDMAC and then MPEG2 video memory reduction, video coding, embedded graphics, and computer vision. Today, his work focuses on developing solutions for tiny machine learning tools and applications.

Since 2019 Danilo is an IEEE Fellow; he served as Industry Ambassador coordinator for IEEE Region 8 South Europe, was vice-chairman of the “Intelligent Cyber-Physical Systems” Task Force within IEEE CIS, was IEEE R8 Afl member in charge of internship initiative, a Member of the Machine Learning, Deep Learning and AI in the CE (MDA) Technical Stream Committee IEEE Consumer Electronics Society (CESoc) and currently is AE of IEEE TNNLS. He wrote and achieved on behalf of ST, the IEEE Milestone on Multiple Silicon Technologies on a chip, 1985 which was granted in 2021.

With over 81 patents, 132 publications, 113 MPEG authored documents and more than 54 invited talks/seminars at various worldwide Universities and Conferences, Danilo's favorite activity remains mentoring undergraduate students, MSc engineers and PhD students from various universities in Italy, US, France, and India.

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Tutorial: How to deploy productively QKeras deeply quantized networks on tiny micro-controllers



Prof. Mohamed-Slim Alouini

King Abdullah University of Science and
Technology (KAUST)



Dr. Mustafa A. Kishk

Mustafa A. Kishk is with the Electronic
Engineering Department, Maynooth
University, Ireland

August 2

<http://coinsconf.com>

Abstract

We are witnessing an unprecedented boost in the space industry. The significant technological advances in the industry of low earth orbit (LEO) satellites have opened the door to a new realm of LEO-based applications. One key application is providing internet broadband services to people everywhere around the globe, which is considered a significant step towards resolving the digital divide problem. The main driver to achieve such satellite-based global connectivity is deploying large numbers of LEO satellites at a set of altitudes, ranging from 300 km to 1500 km, to ensure that every part of the earth will be covered by at least one satellite at all times. Given that we have multiple competing companies launching various constellations with diverse altitudes and numbers of satellites, we can envision a set of spheres concentric with the earth with large numbers of LEO satellites distributed on the surfaces of each of these spheres. Due to the fundamental difference between these novel communication systems, specially the spatial distribution of the communication nodes, and the typical terrestrial communication networks, we need to think of creative techniques to enable mathematically analysing such communication systems. In this tutorial, we discuss a recently proposed mathematical framework that enables tractable analysis of LEO satellite-enabled communication systems while capturing the influence of satellites' numbers and altitudes as well as the spatial distribution of earth stations. Firstly, we describe how this stochastic geometrybased framework is modelled and discuss its accuracy. Next, we provide a detailed example where this framework can be used for coverage analysis. We then introduce and discuss integrated space-aerial-terrestrial networks. Finally, we discuss how this framework can be used to study routing and end-to-end latency analysis in such networks. Realistic values from existing constellations, such as OneWeb and Starlink, are further used as case studies in this tutorial.

Bio

Mohamed-Slim Alouini [S'94-M'98-SM'03-F'09] was born in Tunis, Tunisia. He received the Ph.D. degree in Electrical Engineering from the California Institute of Technology (Caltech), Pasadena, CA, USA, in 1998. He served as a faculty member in the University of Minnesota, Minneapolis, MN, USA, then in the Texas A&M University at Qatar, Education City, Doha, Qatar before joining KAUST, Thuwal, Makkah Province, Saudi Arabia as a Professor of Electrical Engineering in 2009. His current research interests include the modeling, design, and performance analysis of wireless communication systems.

Mustafa A. Kishk [S'16, M'18] is an Assistant Professor in the Electronic Engineering Department at Maynooth University, Ireland. Before that, he was a postdoctoral research fellow in the communication theory lab at KAUST. He received his B.Sc. and M.Sc. degree from Cairo University in 2013 and 2015, respectively, and his Ph.D. degree from Virginia Tech in 2018. His current research interests include UAV-enabled communication systems and satellite communications