

 3-DAY COURSE

Connecting Artificial Intelligence (AI) to Internet of Things (IoT)

TARGET AUDIENCE

Top and middle managers wanting to learn the fundamentals and understand the latest trends of IoT technologies - including edge AI computing - and their industrial applications.

The course will be given in English.

ORGANIZATION

Embedded Systems Laboratory (ESL),
Institute of Electrical Engineering,
Ecole Polytechnique Fédérale de
Lausanne (EPFL)

TEACHING APPROACH

- Optimum balance between theory and practice
- Afternoon demonstrations and sessions in the laboratory with experts on edge AI and Cloud computing using different IoT setups for industrial applications

OVERVIEW

Nowadays, every organization needs to understand the opportunities and challenges offered by smart machine learning devices and IoT connected technologies. High-tech advances in miniaturized, ultra-low power embedded systems, in communication protocols and in AI techniques are leading to disruptive innovations. Established industries are deeply modified. Smart cities, eHealth or Industry 4.0 are part of the new revolution created by Internet of Things (IoT), which now includes smart intelligent sensors.

This 3-day course will cover three main themes: Smart machine learning devices that enable edge AI in cloud-based IoT, Communication for IoT and complete examples of Industry 4.0, smart homes resources sustainability and wearable IoT devices.

OBJECTIVES

- Get a comprehensive overview of latest IoT terminology, machine learning aspects and Cloud computing platforms
- Learn about the most up-to-date developments in edge AI systems including latest commercial solutions, embedded AI and energy management
- Understand main challenges related to communication in different IoT setups for different industrial applications
- Discover examples and case studies of application-oriented IoT designs (in medical, wellness, smart homes, transportation and logistics, smart robotics and Industry 4.0 supply chain applications)



Mon. September 2, 2024
Tue. September 3, 2024
Wed. September 4, 2024



Certificate of attendance



CHF 1'900.-
10% special discount for contributing members of EPFL Alumni



From 9 am to 6 pm



EPFL, Lausanne, Switzerland



On-line registration
Registration deadline : May 31, 2024
Number of participants is limited

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PROGRAM

DAY 1: IoT AND EDGE AI COMPUTING - INTRODUCTION

- **IoT and edge AI computing terminology and concepts:** IoT trends, edge AI, basics of machine learning, etc. / *Case studies: Wearables (Shimmer, Apple Watch) and Industry 4.0 (AWS Zero Touch Kit, TI Sensor Tag, etc.)*
- **Edge AI systems optimization:** Techniques to optimize IoT systems with edge AI / *Case studies: TI Sensor Tag; Shimmer WBSN; Apple Watch; ST Jennic*
- **IoT Cloud platforms and digital twins:** Cloud computing and Big Data AI solutions, overview of commercial platforms for deep learning / *Case studies: AWS IoT, Microsoft Azure and Google Cloud IoT*

DAY 2: COMMUNICATION FOR IoT & EDGE AI COMPUTING

- **Basics:** Latest trends in IoT communication protocols and standards / *Case studies: IEEE 802.15.4 (ULP IoT), 802.15.6 (Body Area Netw.), LoRa, SigFox and 5G*
- **Wireless communication stack:** Overview of different types of communication / *Case studies: IEEE Zigbee and BT Low-Energy; ST NFC for IoT; Emerging M2M: NB-LTE, EC-GSM, NB-Clot, LoRa, Sigfox, 5G*
- **IoT networks design:** *Case studies: Energy, performance and power comparisons between WiFi, WiFi LP, Bluetooth/LE, Zigbee, Z-Wave & En-Ocean, 5G*

DAY 3: APPLICATION-ORIENTED IoT DESIGNS

- **Industrial IoT use cases and business data flows:** Exploration of edge AI devices and IoT to match market needs / *Case studies: Smart Home Appliances, Connected Water Metering IoT-powered Logistics and Supply Chains, and Smart Robotics*
- **Blockchain and secure IoT setups:** IoT networks for safe industrial systems with Blockchain and Cloud AI services / *Case studies: Encrypted IoT devices in smart homes, wearables, Industry 4.0 and environmental sustainability*
- **Interaction of edge AI devices and IoT Cloud Services for Digital Twins:** Data flows for digital twins using Google Cloud Platform, Microsoft Azure and AWS / *Case studies: AWS, Azure and Google Cloud secure data transmission and analysis*

PROGRAM DIRECTOR

- **Prof. David Atienza Alonso,** *Full Professor of Electrical & Computer Engineering and Head of Embedded Systems Laboratory (ESL), EPFL*

INSTRUCTORS (in alphabetical order)

- **Prof. David Atienza Alonso,** *Head of Embedded Systems Laboratory, EPFL*
- **Mr. Ramzi Bouzerda,** *Founder and CEO at Droople*
- **Prof. Andreas Burg,** *Associate Professor of Electrical Engineering and Head of Telecommunications Circuits Laboratory (TCL), EPFL*
- **Ms. Adina Dorte,** *Head of Innovation and R&D Digital Business at GF Machining Solutions*
- **Mr. Matteo Feo,** *Electronics & Digital Experience, Nespresso, Nestlé System Technology Center*
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- **Mr. Steffen Ochsenreither,** *IoT Lead of Data&Insights Unit at Swiss Post*
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