Tutorial title: "A modular neuromorphic framework for the sensor edge"

Tutorial description: In this tutorial, we formulate requirements for modular neuromorphic spiking neural network (SNN) framework that enables optimal hardware-software co-design in next-generation, smart sensing microcontrollers (MCU). In particular,

- *i)* we assess modular SNN design methodology from application, system, sensor and bio-chemical perspective, and evaluate similarities between biological, and silicon-proven macro- and micro-circuits in terms of optimal information transfer,
- *ii)* we define modular hierarchical time-continuous SNN accelerator as dedicated engine for cognitive sensing, and examine strategies to maximize energy-efficiency, latency, flexibility and scalability,
- *iii)* we examine framework software tools requirements for seamless interaction with SNN accelerators, and validate their programmability capabilities and easy-of-use, and
- *iv)* in addition, we highlight the performance of the world's first industrial ultra-low power neuromorphic MCU for sensor data processing, *Innatera's Spiking Neural Processor (SNP) Tiny T1*.