



Dorra Mabrouki

Final-year engineering student

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📅 05/07/2001

🚩 Tunisian

PROFESSIONAL EXPERIENCE

Neuromorphic Computing Intern,

Technische Universität Chemnitz, Chair of Measurements and Sensors Technology

Since 02/2025
Chemnitz, Germany

- Designing a Spiking Neural Network (SNN) model and hybrid SNN-CNN model using Electrical Impedance Tomography (EIT) dataset for Hand Gesture Recognition.
- Training SNN model using supervised learning with surrogate gradient.
- Comparing multiple spike encoding schemes and spiking neuron models to optimize SNN performance for hand gesture recognition.
- Applying compression techniques (knowledge distillation, pruning, quantization).
- Developing and implementing an FPGA-based architecture to efficiently deploy the SNN model.

Keywords: Git, snnTorch, SpikingJelly, PyTorch, Lattice iCE40UP5K, Verilog, Yosys, NextPNR, GTKwave

IoT and Embedded Systems Intern, Technozor

06/2024 – 08/2024
Tunis, Tunisia

- Developed a LoRaWAN Gateway using Raspberry Pi 4 and RAK2287 Pi HAT for agricultural monitoring.
- Configured gateway on The Things Network (TTN) with OTAA for secure sensor communication.
- Built LoRa node with Arduino and RAK811 module, integrating DHT11 sensor for temperature and humidity data.
- Implemented JavaScript payload decoder on TTN to process uplink sensor data in real time.
- Tested gateway coverage up to 10 km, achieving 95% packet delivery rate in rural environments.

Keywords: Python, JavaScript, Raspberry Pi, LoRaWAN, RAK2287 Pi HAT, RAK811, Arduino

Robotics Instructor, Aeros Innovation Center

06/2024 – 08/2024
Tunis, Tunisia

- Taught Arduino programming, Scratch, and basic electronics.
- Introduced fundamental algorithms and hands on problem solving activities.

Keywords: Arduino, Scratch, Robotics, Problem Solving

EDUCATION

Industrial IT and Automation Engineering,

National Institute of Applied Science and Technology (INSAT) ✉

Since 09/2020
Tunis, Tunisia

A multidisciplinary engineering field that combines computer science, electronics, and control systems. The program focuses on embedded systems, industrial automation, robotics, real-time systems, and intelligent control.

PERSONAL PROJECTS

Smart Home Automation System

2023

- Deployed Home Assistant OS on Raspberry Pi with a custom dashboard for local device monitoring and control via web UI and mobile app.
- Integrated MQTT broker and Node-RED for automation and light switch control.
- Set up home surveillance by connecting and managing IP camera within Home Assistant.

Keywords: Docker, Home Assistant OS, MQTT, Node-Red, JavaScript, Python, Raspberry Pi, Camera, RTSP

Drone Stabilization System

2022

- Implemented a PID control algorithm to stabilize drone flight by regulating motor speed and position.
- Integrated IMU sensor data for real-time feedback to maintain balance during pitch, roll, and yaw motions.

Keywords: Arduino, C/C++, IMU, PID, Kalman filter

SKILLS

Programming and Scripting Languages

Python, Java, C/C++, JavaScript

Robotics / Embedded Systems

ROS 1, ROS 2, Arduino, STM32, ESP32, Raspberry Pi

Communication Frameworks

UART, SPI, I2C, CAN, Ethernet, MQTT, Node-RED

Neuromorphic Computing / Machine Learning

snnTorch, PyTorch, SpikingJelly

LANGUAGES

English: C1 | **French:** C1 | **German:** A2 (in progress) | **Arabic:** native

ORGANISATIONS

Robolympix 2.0, Technical manager

2023 – 2024
Tunis, Tunisia

- Led a team of 10 members to prepare the specifications document and design the playground for the challenge.
- Contributed to organizing and setting up the technical aspects of the event.

AEROBOTIX INSAT Club, Sponsorship Manager

2023
Tunis, Tunisia

- Established partnerships with companies to secure funding and support for club activities.