



# Mohamed Bilel Khadhraoui


## Embedded Software Engineer


 mohamedbilel.khadhraoui@insat.ucar.tn  Mohamed Bilel Khadhraoui  AKhadhraoui47  My Portfolio


### EDUCATION




**Master of Engineering in Embedded Systems,** 09/2020 – 09/2025 | Charguia, Tunisia  
*National Institute of Applied Sciences and Technologies*   
Control Theory • Electronics • Algebra • Calculus • Assembly • UML • OOP • Algorithms • Linux


### WORK EXPERIENCE

**Embedded Software Intern - E-Mobility,** *Watt&Well*  03/2025 – 09/2025 | Massy, France


- Extended EVI functionalities to enable advanced commandability of externally constructed Power Units
- Architected a CANopen-to-CAN gateway in Golang  to ensure compatibility with power units from multiple vendors (Infy, UUGreenPower ...)
- Put a set of unit and integration tests for reliability of complex power system architectures under various operational scenarios
- Enabled integration and control of up to 8 external power units, enhancing power system scalability

**Embedded Linux Intern,** *STMicroelectronics*  07/2024 – 09/2024 | Tunis, Tunisia

- Conducted an in-depth exploration of the OpenSTLinux distribution and boot chain of MP135 microprocessor; U-Boot, TF-A, OP-TEE, Kernel
- Crafted a high-performance kernel module  for the Grove WiFi V1/V2 module using the TTY framework for serial communication (UART).
- Designed and implemented a Command Line Interface (CLI)  in C, delivering efficient abstraction and control of the kernel module.
- Authored Yocto recipes for Device Tree configuration and cross-compilation, ensuring seamless deployment on the MP135  Microprocessor.


**Embedded Software Engineer,** *Shanon Technologies*  09/2023 – 01/2024 | Toulouse, France

- Benchmarked ShanonDSPWizard through complex block diagram implementation, performance evaluation, and live demonstration.
- Developed a cross-platform Software Abstraction Layer for STM32H723 FMAC Peripheral, enhancing portability and IIR/FIR filters implementation.

**Embedded Software Intern,** *Shanon Technologies*  07/2023 – 08/2023 | Toulouse, France

- Studied and analyzed the performance and hardware limitations of STM32H723 CRC and CORDIC hardware accelerators.
- Designed a cross-platform middleware for CORDIC and CRC, providing APIs for configuration, manipulation with a technical documentation.
- Expanded the STM32H723 CORDIC's and FMAC's function range by implementing a recursion-based approach for mathematical decomposition to address the fixed-point system.

### PROJECTS

**Real-Time Motion Tracker**  01/2024 – 02/2024

- Mastered core principles of Embedded Linux, building a strong technical foundation; Makefile, GCC, Yocto.
- Generated a custom Yocto image for Raspberry Pi 4 to interface with the MPU6050 IMU via I2C, enabling data reading and logging.

**International Robotics Competition Eurobot** 11/2022 – 06/2023

- Realized autonomous mechanical systems for advanced automation; 3 DoF Robotic Arm, Rolling base.
- Optimized Dijkstra-based path planner using 2D geometric model of the robot's environment, achieving 4x faster computation-to-travel time.
- Integrated a state machine within the ROS environment using Python 3, enabling seamless mechanical synchronization.

**Trajectory Planner of an autonomous robot** 09/2022 – 10/2022



- Assembled a differential wheel robot with a custom navigation framework, generating a trapezoidal velocity profile reaching 1.8 m/s.
- Formulated a control algorithm implemented on an STM32H745 MCU, employing odometry and PID control for enhanced maneuverability.
- Fine-tuned 12 parameters of the PID control algorithm to achieve an error margin of less than 1 mm from the desired coordinates.

### SKILLS


**Computational Thinking:** Composition/Debugging/Abstraction | **Embedded Peripherals:** GPIO/TIMER/ADC/DAC/CORDIC/FMAC/CRC | **Microcontrollers:** STM32/ATmega/ESP32 | **Softwares:** CubeIDE/CubeProgrammer | **Programming:** Embedded C/Go/Bash/Python/C++ | **Test Equipements:** Logic Analyzer/Oscilloscope | **Microprocessors:** Raspberry Pi/STM32MP | **Version Control System:** Git/Github | **Communication Protocols:** UART/I2C/SPI/CAN/CANopen | **Embedded Linux:** Yocto/OpenSTLinux/Makefile/Cross Compilation/Kernel Dev


### CONTRIBUTIONS


**Open Source Contribution** 08/2024 – 03/2025

- Deployed and maintained a kernel module  for the SeeedStudio Grove WiFi V1/V2.
- Provided and maintained a user-friendly CLI  to interact with the module .

### ORGANIZATIONS

**Son FM, Radio Presenter**  06/2024 – present

- Led the MagTech IT Segment live, delivered tech insights to over 5000 listeners and produced engaging content  with over 9000 interactons.

**TechMag, Digital Creator**  01/2024 – present

- Produced high-quality digital content on advanced deeptech topics, engaging an audience of over 10,000 viewers on social platforms.

**IEEE RAS INSAT Student Branch, Technical Trainer**  09/2022 – present

- Spearheaded more than 5 workshops; Embedded Linux, STM32 in collaboration with 3 different institutes, hosting more 30 participants each.

### LANGUAGES

• French | C1                      • English | C1                      • Arabic | Native Language                      • German | A1