

# Muhammad Zareii

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## Profile

Electronics Engineer and Master's student in Wireless Communications Engineering at the University of Oulu, with hands-on experience in validation and characterization of analog, embedded, and power electronic systems. I have taken hardware from schematic to bench, including an offline isolated SMPS, and validated real-world behavior through oscilloscope-based measurements, startup debugging, and iterative failure analysis.

Former Electronics R&D Engineer in industry (2022–2024). Completed the coursework phase of an M.Sc. in Micro/Nano Electronics with top rank, providing a strong foundation in analog circuits, semiconductor devices, and measurement-driven engineering.

## Professional Experience

**Electronics R&D Engineer** — Sepidgaman Parseh, Shiraz, Iran | 2022–2024

- Designed and implemented embedded and sensor-based electronic systems from schematic to prototype.
- Developed motor drivers, optical and color-detection sensors, and precision laser driver circuits.
- Programmed and debugged microcontrollers (AVR, ARM, ESP32) for control, data acquisition, and communication.
- Validated and debugged hardware at bench level, identifying and resolving power, startup, and signal-integrity issues through oscilloscope-based measurements, component-level analysis, and iterative design fixes.
- Analyzed and correlated expected circuit behavior with bench measurements using Python/MATLAB-based analysis.

## Education

**M.Sc., Wireless Communications Engineering (WCE)** — University of Oulu, Finland (2025–present)

**M.Sc. studies, Micro/Nano Electronics** — Tarbiat Modares University, Tehran, Iran (coursework completed with top rank; thesis planned later within remaining study right, not currently active)

Coursework: Semiconductor Devices, Quantum Electronics, Optoelectronics, Biosensors, Advanced Solid-State Physics, Advanced Optics.

**B.Sc., Electrical Engineering (Electronics)** — University of Tabriz, Iran (2018–2023)

**Bachelor's Project – Offline Isolated Flyback SMPS:** Designed and experimentally validated an offline isolated flyback SMPS using a UC3842 current-mode PWM controller and external gate driver. Characterized ~100 kHz switching behavior, startup dynamics, and high-dv/dt waveforms under rectified mains input using oscilloscope-based validation. Implemented and tuned startup bias and snubber/clamp networks to address UVLO cycling, resistor overheating, and switching overshoot (pictures in portfolio).

## Skills

- **Test & Validation:** bench-level hardware validation, startup/debug analysis, oscilloscope-based characterization, measurement repeatability, result correlation
- **Power & Analog Electronics:** offline SMPS fundamentals, current-mode control basics, analog and mixed-signal circuits, semiconductor device fundamentals
- **Instrumentation:** oscilloscope, DMM, DC power supplies, logic analyzer, VNA, spectrum analyzer
- **Embedded Systems:** STM32 (CubeIDE, FreeRTOS), AVR, ESP32, I2C / SPI / UART, real-time data logging
- **Automation & Analysis:** Python, MATLAB (measurement automation, data analysis, visualization), Git/GitHub
- **Design & Simulation Tools:** Altium Designer, Proteus, COMSOL Multiphysics

## Selected Projects

- **STM32 Data Logger Board (2025):** Multi-sensor data logging platform with SD storage and real-time telemetry; validated interface reliability and data integrity on bench.
- **Measurement & Data Analysis Workflows:** Built Python/MATLAB scripts to process measurement datasets, extract engineering metrics, and generate reproducible plots for validation and reporting.