Ali Mobini

Computer Science Student | Embedded & Software Engineer

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Profile

Final-year **Applied Computer Science student (Saxion University)** with over **4 years of experience** in embedded systems, software development, and applied research. Skilled in **FPGA/VHDL design**, **Linux kernel drivers**, **signal processing**, and **probabilistic algorithms**, with strong experience in backend (**.NET, SQL**) and data/ML systems (**Python, Docker, Airflow**). Blending backgrounds in **Computer Science, Computer Engineering, and Mechanical Engineering**, I have delivered high-precision mechatronic systems (**25µm placement robot**) and presented research in **probabilistic GNSS geofencing** (**ICT.OPEN 2025**). Curious, structured, and hands-on, I thrive in **multidisciplinary engineering teams**, where I bridge software, hardware, and data-driven design to build reliable, scalable systems.

Core Skills

- **Hardware & Embedded Systems:** FPGA/VHDL design (Intel MAX10, Cyclone V), NIOS II soft-core integration, UART/VGA protocols, timing analysis, RTOS, Linux kernel driver development, real-time GNSS and sensor interfacing.
- **Software Development:** .NET Core, C/C++, C#, Python, SQL Server, Flask/Django, RESTful APIs, multithreading, microservices, and automation scripting.
- **Data & ML Systems:** Kalman filters, Gaussian/Bayesian reasoning, signal and time-series analysis, feature engineering, data pipelines, evaluation frameworks, ML model deployment (Docker, MLflow, Airflow).
- **DevOps & Deployment:** Linux systems (**systemd**, udev, bash scripting), Docker containerization, CI/CD, distributed logging, reproducible environments, and service monitoring.
- **Research & Analysis:** Probabilistic modeling, error propagation, spatial uncertainty estimation, algorithm optimization, experiment design, and performance evaluation.
- **Collaboration:** Agile/Scrum, technical writing, stakeholder communication, and cross-disciplinary teamwork.

Education

Saxion University of Applied Sciences, Enschede, Netherlands *09/2022 – 08/2026*
Bachelor of Applied Computer Science
Summa Cum Laude, GPA: 9/10 (Propaedeutic Achievement)

Azad University (IAU) *09/2019 – 07/2022*
Computer Engineering
completed 6 out of 8 semesters toward B.Sc.

Azad University (IAU) *09/2015 – 08/2019*
Mechanical Engineering
completed 7 out of 8 semesters toward B.Sc.

Certifications: C# Programming, Android Development Pack, CCNP Switch, SQL Server Database Development

Experience

Junior Researcher | *AMI Research Group Saxion University*, Enschede, Netherlands *08/2023 – 08/2025*

- Developed an embedded **GNSS-based geofence safety system** with Witteveen+Bos, achieving **20 cm RTK accuracy**.
- Designed **modular Linux service architecture** using systemd, udev, and WebSocket data streaming for robust startup and remote monitoring.
- Built a **probabilistic decision-making framework** using Kalman filters, Bayesian models, and Gaussian PDFs to reduce false alarms by **30%**.
- Presented results at the **ICT.OPEN 2025 conference**.

Software Developer | *MTN Irancell Service Center* *06/2019 – 07/2021*

- Built a full-stack **C# .NET accounting system** with SQL Server, JWT/OAuth authentication—improving accuracy by 25%.
- Automated financial workflows via **Python/Selenium**, achieving 100% report accuracy and cutting manual work.
- Developed an Android client and initiated a cross-platform Flutter prototype.

Supervisor & Technical Support Agent | *MTN Irancell Service Center* *04/2017 – 06/2019*

- Managed and trained a customer service team, reducing average response time by 30%.
- Provided high-level technical and network support; achieved 91% customer satisfaction rate.

Key Projects

FPGA-based ALU & Display System (Minor Embedded Systems, Saxion University)

- Designed and synthesized an Arithmetic Logic Unit in **VHDL** with basic instructions.
- Implemented a **VGA** signal generator (1080p, 60Hz) and **UART** protocol for real-time text display.
- Hands-on with **FPGA timing analysis**, **Quartus** toolchain, and debugging.

NIOS II Embedded Processing Unit (Minor Embedded Systems, Saxion University)

- Integrated **NIOS II** soft-core processor with custom FPGA peripherals.
- Wrote **embedded C** programs for hardware validation and I/O testing.

Linux Kernel Driver for Embedded Sensors (Minor Embedded Systems, Saxion University)

- Built a custom **Linux driver** for hardware-software communication.
- Resolved concurrency and memory errors via **GDB** debugging and systematic testing.

Geofence Safety Alarm System *(AMI Research group with Witteveen+Bos)*

- Built a **probabilistic decision-making** system using **Gaussian PDFs**, **Kalman filters** and **Python**.
- With RTK, improved GNSS localization to **20 cm**; reduced false alarms by **30%**.
- Research published and accepted at **ICT.OPEN 2025**.

MLOps Pipeline for Predictive e-nose Data (AMI Research group Internship)

- Built end-to-end pipeline (**Python**, **Docker**, **Airflow**, **MLflow**, **Grafana/InfluxDB**): ingest -> preprocess -> model (**XGBoost**/**Chronos**) -> evaluate -> deploy.
- Achieved **RMSE 0.15** and reduced deployment time by **40%**; exposed predictions via a lightweight **n8n** chatbot API.

High-Precision Magnet Placement Robot *(8-person team Saxion University)*

- Developed a **Python** + **PyQt** UI with **ROS2** for real-time robot control and simulation.
- Debugged **C++** motor control code in Linux, resolving segmentation faults.
- Achieved **25µm** accuracy (better than project goal); system ranked 1st in showcase.

Autonomous RC Car *(6-person team Saxion University)*

- Implemented **PID control** & **sensor fusion** (**LIDAR**, **ToF**) for adaptive hill climbing and obstacle avoidance.
- Designed innovative slope detection method with ToF sensors, boosting performance.

Smart Health Monitoring Wearable *(7-person team Saxion University)*

- Developed an **IoT** wearable with **OTA** firmware updates, biometric collection, and **90%** accurate fall detection.
- Designed embedded software architecture and implemented fall detection algorithm.

Automated Accounting & Staff Monitoring *(MTN Irancell Service Center)*

- Created a secure C# .NET system with JWT/OAuth authentication and SQL backend.
- Automated workflows with Python/Selenium, boosting efficiency by 25%.
- Demonstrated early interest in financial data systems and automation.

Technical Skills

Hardware & FPGA Development:
FPGA design & verification (Quartus, Intel MAX 10, Cyclone V), **VHDL/Verilog/SystemVerilog**, hardware–software co-design, **VGA/HDMI** signal generation, **UART/SPI/I2C** communication protocols, timing analysis, testbench development, and embedded **NIOS II** systems

Programming Languages:
Python (•••), **C#** (•••), **C++** (••), **C** (••), **VHDL** (••), Java (••), Verilog/SystemVerilog (•), Shell Script (•), Haskell (•)

Embedded Systems & Operating Systems:
Embedded Linux (kernel driver development, device tree configuration, core dump analysis), **RTOS** (task scheduling, synchronization), **PlatformIO**, Arduino/ESP microcontrollers, hardware debugging with **GDB** and logic analyzers

Software Engineering & Data Systems:
.NET Core (•••), Flask/Django (••), SQL Server / PostgreSQL (•••), **Azure IoT Hub**, RESTful API development, automation with Python/Selenium, containerization with **Docker & Kubernetes**, and CI/CD pipelines

Mathematical & Analytical Methods:
Probability & Statistics, **Signal Processing**, **Kalman Filtering**, Bayesian inference, numerical optimization, and algorithm design (graph theory, dynamic programming)

Collaboration & Development Practices:
Agile/Scrum, version control (Git), pair programming, peer reviews, documentation, and cross-disciplinary teamwork with clear

stakeholder communication

Soft Skills

Strong Problem Solving | Analytical Mindset | Self-Learning | Team Player Collaboration | Stakeholder Management | Adaptability | Attention to Detail Strong Communication | Innovative | Time Management | Eager to Learn

Languages

Persian (Native) | **English** (Fluent, Business Proficient) | **French** (A2) | **Dutch** (A1)

Hobbies

Reading | Robotics | Mathematics | Traveling | Swimming | Languages