KEMAL BATUHAN ABUT

Graduate Student | Laboratory Instrumentation | Wireless Sensor Networks | AI & Embedded Systems

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PROFILE

Master's student in Hacettepe University's CBRN Threats Management program (GPA 4.00/4.00; expected June 2027). Develops low-cost laboratory instrumentation, environmental sensing and wireless IoT networks, combining embedded firmware, data acquisition, and automated control. Professional systems experience spans utility-scale energy infrastructure, HL7-connected healthcare workflows, and AI-driven software.

EDUCATION

Hacettepe University | Master's Program in CBRN Threats Management
Division of Chemistry · Feb 2026 – Jun 2027 (expected) · GPA 4.00/4.00

Bilkent University | B.A. in Economics
Graduated Aug 2023

SELECTED LABORATORY INSTRUMENTATION & IoT PROJECTS

Low-Flow-Rate Peristaltic Pump | ESP-based laboratory instrumentation

- Designed and built an under-US$100 pump with FDM 3D-printed components for low-flow-rate liquid handling.
- Enabled Bluetooth / Wi-Fi monitoring and remote control through an online dashboard.

Bosch BME690 Gas Resistance Sensor | Contained fungal incubation

- Developed ESP32-C3 sensing and logging hardware using a ~US$2 controller board, Bluetooth communication, and up to 36 hours of raw measurement storage.
- Hands-on experience with Bosch Sensortec Environmental Cluster (BSEC) libraries for environmental sensor processing.

3D-Printable Micropipette | In progress

- Designing an FDM 3D-printable micropipette for low-cost laboratory liquid handling.

City-Scale Wireless Mesh Network | Electricity distribution IoT

- Designed a city-scale mesh-network architecture using ESP-based and LoRa nodes for distributed IoT connectivity at an electricity distribution company.

OPEN-SOURCE AI AGENT & RESEARCH TOOLS

Elsevier MCP | github.com/kemalabuteliyte/elsevier-mcp

- Developed an MCP server connecting AI agents to Elsevier APIs for Scopus search, research article retrieval, and scholarly metadata.

FTP MCP | github.com/kemalabuteliyte/ftp-mcp

- Built an MCP server enabling AI-agent file operations over FTP, FTPS, and SFTP, including remote transfers and synchronization.

PROFESSIONAL EXPERIENCE

Aktif Enerji A.Ş. | Software Project Manager | Jan 2024 – Jan 2025

- Developed a fully automated remote energy meter-reading and relay-control system capable of operating 100,000 devices in under 10 minutes.
- Developed embedded software for STM32- and ESP32-based communication modems, integrating field hardware with remote command and data services.
- Developed handheld terminals for local electricity-meter readings using probe interfaces.

Alfa-Line Telecommunication Services | Software Project Manager | Jan 2022 – Jan 2023

- Developed an intensive care unit (ICU) data-flow management system coordinating nurses, physicians, and patient-monitoring devices.
- Integrated HL7-based data exchange for interoperability between monitoring devices and clinical workflows.

ADDITIONAL SYSTEMS ENGINEERING

AI-Driven Automated Trading Platform | Independent engineering project

- Built an automated real-time trading system using PyTorch transformer inference, FastAPI, and REST / WebSocket services; handled 2,000–5,000 daily transactions at ~65 ms decision latency.
- Optimized numerical processing with NumPy and Numba JIT, reducing a critical execution path from ~90 seconds to ~12 ms.

INDEPENDENT PRODUCT DEVELOPMENT

YerliMail (yerlimail.com) | Founder, Owner & Developer

- Founded and developed an email software platform with application, account, backend, and deployment workflows.
- Designed AI agent workflows automating image generation, marketing content, and management of YerliMail's online presence.

TECHNICAL CAPABILITIES

Embedded & instrumentation ESP32 / ESP32-C3, STM32, BME690, Bosch BSEC, embedded logging, FDM 3D printing, sensors, remote dashboards.
Wireless & networking LoRa, ESP-NOW, Wi-Fi, BLE, mesh networking, cellular links, MQTT, TCP/IP, device-to-cloud systems.
AI & systems Python, PyTorch, transformers, NumPy, Numba, agentic workflows, MCP, FastAPI, REST, WebSockets, HL7.
Platforms JavaScript, PHP, React Native, MongoDB, PostgreSQL, MariaDB, SQLite, authentication and access control.