

Samuele Arabia

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PROFESSIONAL SUMMARY

Computer Engineering student focused on embedded software, real-time systems and software architecture, with hands-on experience developing C++ firmware for avionics applications within the Sapienza Rocket Team. Experienced with Raspberry Pi RP2350, FreeRTOS, CMake, hardware/software integration, serial debugging and firmware testing. Complementary experience designing full-stack, microservices and AI-driven systems with FastAPI, React, TypeScript, LangGraph, Docker, databases and LLM-based applications, with a long-term interest in embedded systems, robotics and intelligent software.

EDUCATION

Sapienza University of Rome
B.Sc. in Computer and Control Engineering

Rome, Italy
Sep. 2022 – Expected Dec. 2026

EXPERIENCE

Sapienza Rocket Team
Avionics Software Developer

Rome, Italy
Oct. 2025 – Present

- Developed and maintained embedded C++ firmware for avionics systems, investigating firmware issues, debugging unexpected behavior and continuously verifying software correctness and reliability during development and integration.
- Integrated firmware support for multiple avionics components, including the ADC, speaker, GNSS subsystem and part of the Kalman filter implementation, ensuring correct interaction with the existing firmware architecture.
- Collaborated with the Controls team by integrating algorithms and components developed and simulated by them in Simulink/MATLAB; performed firmware-side testing on the shared GitHub repository and implemented validated components in the main firmware.
- Performed hardware/software integration, testing and debugging through serial communication, runtime logging and systematic analysis of firmware behavior under real-world hardware and resource constraints.
- Collaborated within a cross-functional engineering team, coordinating software integration and troubleshooting while adapting firmware implementations to interfaces and requirements defined by other subsystems.

PROJECTS

AEHub – AI Agent Orchestration Platform | *Next.js, FastAPI, LangGraph, PostgreSQL, Docker*

Jun. 2026 – Present

- Developing a full-stack AI agent platform built around a LangGraph runtime for iterative reasoning, tool calling, persistent memory, retrieval and multi-agent task delegation.
- Designed a modular skill-based architecture integrating web search, sandboxed Python/shell execution, specialized subagents, browser automation and MCP-based external tools.
- Implemented persistent agent state and memory with PostgreSQL/pgvector, asynchronous background execution with Celery/Redis, and real-time event streaming and observability.

CodeForge – AI-Assisted Portfolio Platform | *Astro, TypeScript, Fastify, MongoDB, Mongoose, Docker*

May. 2026 – Present

- Developed a full-stack portfolio platform with an Astro/React frontend, Fastify backend and MongoDB persistence, using database-driven project and experience management.
- Applied a Controller–Service–Repository architecture with schema validation, JWT-based authentication, secure cookies, rate limiting and structured error handling.
- Built an AI-assisted documentation pipeline that uses public GitHub repository context to generate and persist evidence-based technical project documentation, supported by automated testing and CI.

NT-To-SQL – Natural Language to SQL | *Python, FastAPI, Ollama, MariaDB, Docker*

Jun. 2025 – Aug. 2025

- Developed a full-stack application that converts natural-language questions into executable SQL using a locally hosted Ollama LLM.
- Designed a Dockerized microservices architecture separating the frontend, FastAPI backend, Ollama inference, MariaDB database and automated testing services.
- Implemented REST workflows for natural-language search, direct SQL execution, schema inspection and database data entry.

TECHNICAL SKILLS

Programming:	C, C++, Python, Java, JavaScript, TypeScript, SQL.
Embedded & Systems:	Embedded C++, Firmware Development, FreeRTOS, Real-Time Systems, Sensor Integration, ADC, GNSS, Kalman Filtering, Hardware/Software Integration, Object-Oriented Programming.
Hardware:	Raspberry Pi RP2350, ADC, Sensors, Speaker, GNSS, Serial Communication.
Software Engineering:	Data Structures, Algorithms, System-Level Architecture, Microservices, REST APIs, CMake, Testing, Debugging.
Web & Backend:	React, Next.js, Astro, Node.js, Fastify, FastAPI, MongoDB, Mongoose, MariaDB, PostgreSQL.
AI & Automation:	LLM-based Applications, LangGraph, Ollama, RAG, Agent Tool Calling, Browser Automation, Playwright.
Tools:	Git, GitHub, Docker, Linux, CLion, Arduino IDE, Picotool.

LANGUAGES

Italian: Native	English: C1+	French: C1+
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INTERESTS

Technology:	Embedded Systems, Robotics, Artificial Intelligence, Software Architecture	
Sports:	Football, Running	Music: Music Production, Soundtrack Production, Songwriting, Rap, Singing
Cinema:	Science Fiction, Fantasy	Personal Growth: Mindset, Continuous Learning, Self-Improvement, Neuro-Psychology