Flavius Gabriel Marc



Software & AI Engineer

Full-stack software and AI engineering for new products and systems already in production

Utrecht, Netherlands | Romanian (EU citizen)
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Profile

Software engineer with over 7 years of experience at a global automotive supplier, a software consultancy, medical-technology startups and university hospitals: from embedded C/C++ firmware to medical device software and full-stack AI applications with LLMs, LangGraph, FastAPI and Supabase. I like working close to the people who use the software: understanding their problem, building the solution and getting it into production.

Work experience

Xyall Software Engineer — Jun 2025 – present
Eindhoven, Netherlands. Medical technology: the Tissector automates tissue dissection from pathology slides for molecular diagnostics.

- Improved barcode detection for slide identification in the Tissector by about 20% by tuning and validating the detection algorithms.
- Built features and security improvements in the Flask broker service that connects the machine to the clinician-facing front end over REST.
- Streamlined the customer installation workflow, cutting on-site setup time and making rollouts more reliable.
- Develop the core machine software in C# and Python, with a focus on robustness and maintainability.

Tech: C#, Python, Flask, REST APIs, computer vision, Cursor, Claude Code

Bitwise Europe Software Engineer (consultancy) — Dec 2023 – Apr 2025
Eindhoven, Netherlands. Software and test engineering for clients in fintech and assistive technology.

- Built a C# REST API for secure point-of-sale payment transactions over TLS 1.3.
- Extended and optimised a C++ Windows communication server that drives ticketing devices for testing.
- Recreated a client's development environment on Linux virtual machines to run and debug their software package.
- Designed test setups for a prototype sensor in an assistive walking device, collected the data and analysed it in Python to evaluate usability.

Tech: C#, C++, Python, Java, Kotlin, Linux, REST APIs

CART-Tech Software Engineer (part-time) — May 2022 – May 2023
Utrecht, Netherlands. Medical imaging startup, cardiac imaging software.

- Added features to and debugged a Qt desktop application for cardiac medical imaging.
- Turned MATLAB image-processing prototypes into optimised Python, including 3D mesh generation and reconstruction.
- Worked directly with the technical manager so the application met clinical accuracy and usability requirements.

Tech: C++, Qt, Python, SciPy, MATLAB, GitLab

Continental Embedded Software Developer — Jul 2018 – Aug 2021
Timișoara, Romania. Automotive radar and camera systems (ADAS).

- Developed bare-metal firmware for radar and camera systems on multi-core ARM Cortex-A53, and debugged multi-core execution with Lauterbach TRACE32 (bootloader, symbols, inter-core coordination).
- Implemented and unit-tested C/C++ modules from UML detailed designs, with requirements traceability to automotive safety standards.
- Took part in code-quality analysis and design reviews with international, multidisciplinary teams.
- Spent my first month in system testing: black-box functional tests of an instrument cluster with CANoe.

Tech: C, C++, ARM Cortex-A53, Lauterbach TRACE32, CANoe, CAN, UML, Jira, Confluence

Research internships

Erasmus MC Research Intern, AI and Computer Vision — Jun 2023 – Sep 2023
Rotterdam, Netherlands

- Trained a U-Net in PyTorch that segments the internal carotid artery in X-ray angiography (test Dice 0.875), and built a Python application that turns DICOM series into four perfusion maps without manual steps. The work contributed to the perfDSA paper (see Publications below); research report in the Utrecht University repository (PDF).

UMC Utrecht Research Intern, literature review — May 2023 – Jun 2023
Utrecht, Netherlands

- Reviewed 51 sources on monitoring congestive heart failure with seismocardiography (accelerometer-recorded chest vibrations): its link to filling pressures, wearable sensors and machine learning. Published in the Utrecht University repository (PDF).

UMC Utrecht Research Intern — May 2022 – Feb 2023
Utrecht, Netherlands

- Diffusion MRI with an ultra-strong gradient head insert at 7 tesla, in MATLAB; co-author of the resulting paper in Magnetic Resonance in Medicine. Research report in the Utrecht University repository (PDF).

Projects

Case studies, live demos and architecture diagrams: flaviusmarc.com

AlphaForge, AI micro-course platform — 2025 – 2026
Built a personalised course and AI tutor for every learner: LangGraph with LangChain agents, LangSmith tracing, FastAPI on Cloud Run, Supabase (auth, PostgreSQL with row-level security, edge functions), React, TypeScript; started on Lovable and Make.com.

Alex, learning assistant in Slack — 2026
Built a LangGraph state machine with guardrails and fact grounding (Perplexity), voice notes with Gemini text-to-speech, Supabase, Docker on Cloud Run.

Medical note classifier — 2025
Fine-tuned Bio_ClinicalBERT to sort notes into five specialties (72% accuracy, macro F1 0.71), served by FastAPI in Docker; exported to ONNX and quantised to 8 bits (433 to 109 MB) to run in the browser.

Question answering over PDFs with ColPali — 2025
RAG on page images with a vision-language model (ColQwen2, late interaction) and Gemini; FastAPI, PostgreSQL, JWT sign-in, encrypted per-user API keys, Svelte.

Personal agentic hub — 2026 – present
Hermes on a VPS, where one agent runs my automation scripts, such as appointment booking by browser automation, alongside a personalised workout logger.

MSc projects — 2021 – 2023
C++ image-processing library and calculator (now running in the browser via WebAssembly); camera calibration and 3D voxel reconstruction (C++, OpenCV, K-means, Gaussian mixture models); CNNs and transfer learning (TensorFlow, Keras); image registration with Elastix.

Skills

Languages	Python, C/C++, C#, TypeScript, JavaScript, SQL, MATLAB, Java, Kotlin
AI and LLMs	LangGraph, LangChain, LangSmith, RAG, embeddings and vector search, vision-language models, agents and tool calling, OpenAI, Gemini, prompt and context engineering, guardrails, evals
Machine learning	PyTorch, TensorFlow, Keras, NLP (BERT fine-tuning, text classification), Hugging Face Transformers, CNNs, U-Net, transfer learning, ONNX, quantisation, K-means, Gaussian mixture models
Vision and imaging	OpenCV, segmentation, image registration (Elastix), camera calibration, DICOM, MRI, CT, X-ray angiography
Back end and cloud	FastAPI, Flask, REST, PostgreSQL, SQLAlchemy, Supabase, Docker, Google Cloud (Run, Storage), Vercel, JWT
Front end	React, Svelte, Qt, WebAssembly
Embedded	Bare-metal ARM Cortex-A53, Lauterbach TRACE32, CAN and CANoe, DSP, microcontrollers
Tools	Git, GitHub, GitLab, Linux, CI/CD, pytest, Jira, Confluence, Claude Code, Cursor

Education

MSc Medical Imaging, Utrecht University and TU Eindhoven, Netherlands — Sep 2021 – Dec 2023
BSc Applied Electronics, Politehnica University Timișoara, Romania — Oct 2015 – Jul 2019

Publications

- R. Su, P. M. van der Sluijs, F.-G. Marc, et al. perfDSA: Automatic Perfusion Imaging in Cerebral Digital Subtraction Angiography. International Journal of Computer Assisted Radiology and Surgery, 2025. Link
- G. C. Arends, E. Versteeg, A. De Luca, F. Marc, et al. Feasibility of strong diffusion encoding and fast readout using a plug-and-play head gradient insert at 7 T. Magnetic Resonance in Medicine, 2025. Link

More about me

Certificates	DeepLearning.AI: AI Agents in LangGraph, Multi AI Agent Systems with crewAI, AI Agentic Design Patterns with AutoGen (2024).
Languages	Romanian (native), English (professional), Dutch (A2, learning), Portuguese and Spanish (conversational).
Interests	Chess (chess.com: flavius25), gym, swimming, concerts and events; violin at the Popular School of Arts Timișoara (2005 – 2010). Driving licence B.