Marc Schmitt
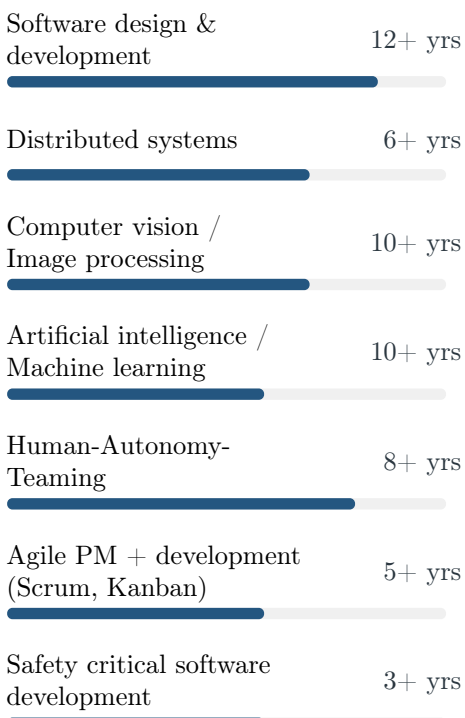Master of Engineering (M.Eng.)

▸ 22.07.1985 in Erlenbach am Main

▸ German

▸ Unmarried

Contact

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in marcschmitt85

Skills

Software design & development	12+ yrs

Distributed systems	6+ yrs

Computer vision / Image processing	10+ yrs

Artificial intelligence / Machine learning	10+ yrs

Human-Autonomy-Teaming	8+ yrs

Agile PM + development (Scrum, Kanban)	5+ yrs

Safety critical software development	3+ yrs

Profile + Status

Software Development Lead + Software Architect, M.Eng. Electrical Engineering and Information Technology

- Software engineer with a strong background in distributed systems and backend development with a passion for open source software.
- Focused on SW quality, efficiency, and maintainability, with a strong belief in KISS-principles.
- Strong advocate of agile mindsets and work environments.
- Customer-oriented and structured method of working.

Work experience

Head of Development   2021 – current
HAT.tec GmbH

Lead development towards commercialization and product development of AI-based mission management and human-autonomy teaming technologies.
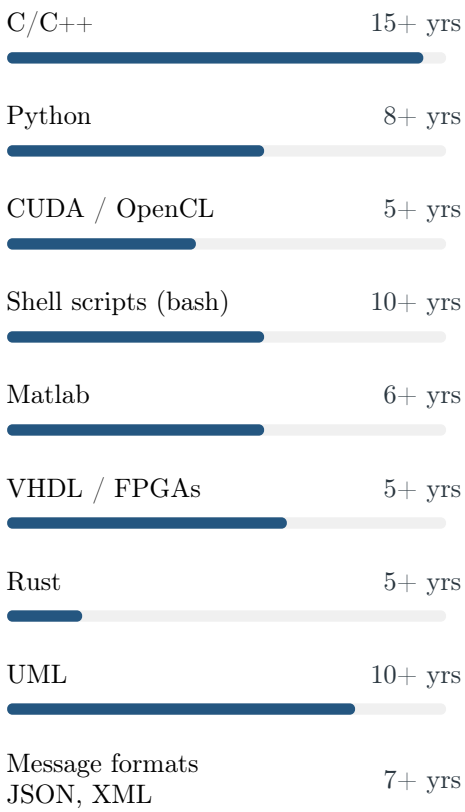
- Supervised and directed the further development of the overall system and software architecture for the companies human autonomy teaming (HAT) and mission management software stack.
- Coordination and supervision of the software development teams and their performance in their respective development projects.
- Coordination and synchronization of the development projects and overseeing synergies.
- Adapted and launched a software lifecycle and development process landscape incorporating agile principles while incorporating requirements on safe avionics software as given by ED-12C/DO-178C.
- Developing and ramping up the development team, interviewing candidates (mostly on technical expertise).
- Develop and define the companies' technology roadmap, synchronization of tech roadmap with product strategy, in close coordination with the program management and CEOs.
- Representing the company and the products on various national and international events, conferences etc., including flight test campaigns and fully-integrated customer demonstrations during (military) exercises.
- Acquisition of new product and R&D projects in close cooperation with program and offer management, including cost and effort estimation.

Lead Software Architect   2019 – 2021
HAT.tec GmbH
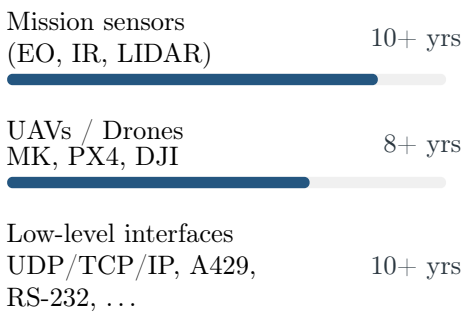
Software and system architecture design of an AI-based human autonomy teaming and mission management/planning software stack.
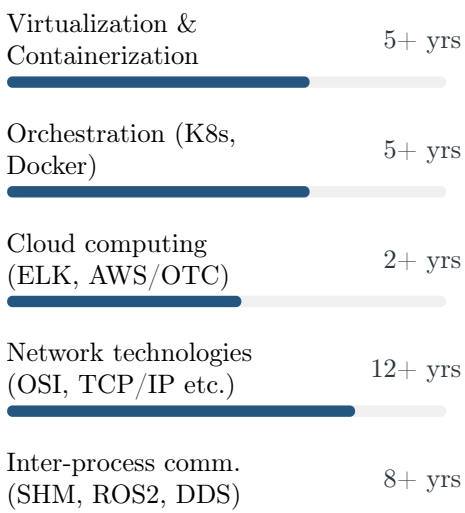
Programming

C/C++	15+ yrs
Python	8+ yrs
CUDA / OpenCL	5+ yrs
Shell scripts (bash)	10+ yrs
Matlab	6+ yrs
VHDL / FPGAs	5+ yrs
Rust	5+ yrs
UML	10+ yrs
Message formats JSON, XML	7+ yrs

Hardware

Mission sensors (EO, IR, LIDAR)	10+ yrs
UAVs / Drones MK, PX4, DJI	8+ yrs
Low-level interfaces UDP/TCP/IP, A429, RS-232, ...	10+ yrs

Technologies

Virtualization & Containerization	5+ yrs
Orchestration (K8s, Docker)	5+ yrs
Cloud computing (ELK, AWS/OTC)	2+ yrs
Network technologies (OSI, TCP/IP etc.)	12+ yrs
Inter-process comm. (SHM, ROS2, DDS)	8+ yrs

- System and software architecture design for human autonomy teaming and mission planning projects with national and international partners / OEMs, mostly in aerospace industry:
    - Design of the overall system and software architecture for the companies' software stack in close collaboration with the function specialists and domain experts.
    - Designed an AI-integrated SW architecture for environmental perception with integrated scaling capabilities (cloud, k8s).
    - Design of OpenAPI compatible REST-APIs to allow platform-independent integration from partner software / systems.
    - Supervision and review of the software development of the individual modules in the software stack.
- Designed and developed an internal inter-process communication (IPC) library for application-transparent TCP/IP- and shared memory (SHM) communication was well as an abstraction shim to integration third-party IPCs (e.g. ROS2, DDS).
- Designed and developed several interface modules to interconnect with state of the art avionic systems and other third-party hardware modules.
- Supervision of the AI-development team towards object detection, classification, and tracking.

Research Associate & Systems Engineer 2012 – 2019
Institute of Flight Systems
Bundeswehr University Munich

Research on cooperative system concepts for on-board environmental perception of teams of unmanned aerial vehicles (UAVs).

Research interests: Multi-UAV Cooperation, Multi-Sensor-Fusion, Aerial Computer Vision, Manned-Unmanned Teaming (MUM-T)

Teaching: mission sensor classes + labs; theses supervision (BA/MA)

CASIMUS

Researcher in the national research project CASIMUS which investigated the deployment of multiple UAVs to support a manned two-seated transport helicopter with up-to-date recce data during the course of mission.

- Designed and -developed a hard- and software framework for the environmental perception on-board (multiple) UAVs.
- Integrated the system in a full-mission simulator to automatically reconnoiter potentially unsafe helicopter landing points.
- Planned, performed and evaluated a multi-week operator-in-the-loop experimental campaign.
- Flight-tested the perception system on-board multiple UAV-demonstrators in a down-sized setup to showcase and demonstrate the systems real-life cooperation and coordination mechanisms as a proof-of-concept.
- ▶ IFS Manned unmanned Teaming for Future Helicopter Missions

Operating Systems

API-Design (OpenAPI, REST, low-level TCP/IP)	10+ yrs
Linux	12+ yrs
Windows	12+ yrs
MacOS	2+ yrs

Tools

VCS (GIT, HG, SVN)	12+ yrs
IT automation (Ansible, Vagrant, . . .)	7+ yrs
IDEs (Visual Studio (Code), QTCreator)	12+ yrs
LaTeX	12+ yrs
Microsoft Office	12+ yrs

Languages

German	L1
English	C1
Spanish	A1

Interests

- ‣ Alpine sports
- ‣ Digitalization
- ‣ Traveling
- ‣ Sailing
- ‣ Festivals + Concerts

PROACTIVE

Researcher in the EU-funded research project PROACTIVE which investigated the usage of multi-sensor networks as well as information fusion and reasoning mechanisms to detect and predict imminent terrorist attacks.

- Showcased the usage of Micro- and Mini-UAVs as deployable sensor platforms to be dynamically integrated in the multi-sensor network.
- Provided IPC and middleware mechanisms and supported international project partners during their sensor and system integration using that middleware.

Research Engineer (Part-time)   2010 – 2012
TH Aschaffenburg

Development of a FPGA-based pedestrian detection system for smart intersections.

Worked on low-latency real-time pedestrian segmentation and intention detection on Full-HD-images with computer vision and machine learning methods on FPGAs for intersection assistance to detect vulnerable traffic participants as part of national automotive research project Ko-PER.

- Development of a combined GPU/FPGA/PC framework for real-time computer vision.
- Adaption and implementation of computer vision and machine learning algorithms on FPGAs.

Working Student / PLC-Programmer (Part-Time)   2009 – 2012
LÖMI GmbH

- PLC-programming and automation of solvent recycling and PIM debinding plants.
- In-house and customer-side start-up with domestic and international assignments.

Working Student / Intern   2008
Reis GmbH & Co. KG Maschinenfabrik

Working student and internship as part of the Bachelor studies.

- Control hardware and power electronics development for industrial robots.
- EMC measurements of industrial robot systems and design of appropriate mitigation strategies.
- Programming and start-up of industrial robot systems for PV production plants.
- Test and evaluation of new CAE/CAD software solutions.

Working Student / PLC-Programmer (Part-Time)   2005 – 2008
LÖMI GmbH

PLC-programming and assembly of solvent recycling and PIM debinding plants with in-house startup.

Apprentice Electrician (Energieelektroniker)   2002 – 2005
Integtronik GmbH

Building customized industrial computers with my own hands :-)

Education

PhD in Aerospace Engineering
Institute of Flight Systems (Prof. Stütz)
Bundeswehr University Munich

Working Title: „A Cooperative Multi-UAV Perception Management System for the Highly-Automated Reconnaissance of Helicopter Lading Zones"

Master of Engineering (M.Eng.), Grade 1.1
TH Aschaffenburg

Master's thesis: „Memory Management Concepts for Feature Extraction and Classification of Vulnerable Traffic Participants"

Focussed on real-time Computer Vision and Machine Learning

Bachelor of Engineering (B.Eng.), Grade 1.6
TH Aschaffenburg

Bachelor's thesis: „Implementation of a DDR-RAM Controller for Computer Vision Tasks on an FPGA"

Electrical engineering and information technology with a focus on automation technologies and programmable hardware.

Munich, September 10, 2023

Marc Schmitt