Marc Schmitt

Master of Engineering (M.Eng.)

- 22.07.1985 in Erlenbach am Main
- German
- Unmarried

Contact

Schlesierstr. 19
D-81669 München

+49 160 99 169 505

schmitt.marc@gmail.com

marcschmitt85

Skills

Software design & development 12+ yrs

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

Distributed systems 6+ yrs

Computer vision / Image processing 10+ yrs

Artificial intelligence / Machine learning 10+ yrs

Manned-Unmanned-Teaming 8+ yrs

Safety critical software 3+ yrs

Profile + Status

PhD candidate, M.Eng. Electrical Engineering and Information Technology, Software Engineer and Architect

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

Work experience

Lead Software Architect **2019 – now**
HAT.tec GmbH

Lead development towards commercialisation and product development of AI-based human autonomy teaming technologies.

- System and software architecture design for human autonomy teaming and mission planning projects with national and international partners.
  - Design of th overall system and software architecture for the companies SW stack with the function specialists.
  - Designed an AI-integrated SW architecture for environmental perception with future scaling capabilities (Cloud, K8s).
  - Design of REST-APIs for platform-independent integration with partner software.
  - Supervision and review of the software development of the individual modules in the SW stack.
- Designed and developed a inter-process communication (IPC) shim, abstracting multiple IPC / middleware solutions (e.g. ROS2).
- Designed and developed several interface modules to interconnect with avionics and other third-party hardware modules.
- Adapted and launched (agile) software development and software lifecycle models to the company specifics and developed them towards ED-12C/DO-178C certifiable processes.
- Supervision of the AI-development team towards object detection, classification, and tracking.
- Ramping up the development team, technical suport in interviews etc.
- Part of the product strategy development team, outlining SW stack and architecture.

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).

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, ROS 7+ yrs

Hardware

Mission sensors (EO, IR, LIDAR) 10+ yrs

UAVs / Drones MK, PX4, DJI 8+ yrs

Low-level interfaces A429, A739, 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

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, performend 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.
- YouTube IFS Manned unmanned Teaming for Future Helicopter Missions

PROACTIVE

Reseracher in the 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.

Operating Systems

Linux 12+ yrs

Windows 12+ yrs

BSD 8+ yrs

Tools

VCS (GIT, HG, SVN) 12+ yrs

IT automation (Ansible, Vagrant,...) 7+ yrs

VS Code 3+ yrs

QtCreator 8+ yrs

LaTeX 12+ yrs

Microsoft Office 12+ yrs

Languages

German L1

English C1

Spanish A1

Interests

- Alpine sports
- Digitalization
- Traveling
- Guitarist (beginner)
- Festivals + Concerts

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.

Apprantice Electrician (Energieelektroniker) **2002 – 2005**
Integtronik GmbH

Building customized industrial computers with my own hands :-)

Education

PhD in Aerospace Engineering **2012 - 2019**
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 **2010 - 2012**
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 **2006 - 2010**
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, May 2, 2021

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