Mark Geiger

I am a software engineer specializing in embedded systems, functional safety and software engineering. My main areas of work are in the fields of telecommunications, robotics and renewable energies.

Education

2015 - 2018 **M.Sc., Information Technology** - University of Stuttgart

Embedded Systems, Thesis Title: Preliminary Hazard Analysis and Fault Handling Methods in Solar Thermal Power Plant Control Systems

2012 - 2015 **B.Eng., Information technology** - Baden-Württemberg Cooperative State University

Engineering IT, Thesis Title: Tessellation of Trimmed NURBS Surfaces using Multipass Shader Algorithms on the GPU

Professional Experience

Current Work:

since 01.2022: Freelance, Embedded Software Engineer at Ingenieurbüro Geiger

- Design and development of transmitter and sensor software
  - Low level driver development in C++ (SPI, OctoSpi, Uart, HART, etc …)
  - Software Architecture
  - Real-time processing
  - Embedded NOR-Flash file system
  - CI
  - CMake
- Development of mobile robots
  - Low level driver development in C/C++
  - Robot application development in C++

since 04.2020 Lecturer at the DHBW Mannheim, Mannheim

- Communication Technology
- Advanced Software Engineering
- Computer graphics
- Robotics Applications with ROS

Other Work Experience:

03.2021 - 01.2022 Freelance, Field Application Engineer at Quectel Wireless Solutions

06.2019 - 02.2021 Embedded Software Developer at Endress+Hauser Liquid Analysis, Gerlingen

09.2018 - 05.2019 Embedded Software Developer at VITES GmbH, Ottobrunn

10.2015 - 08.2018 Software Engineer at the German Aerospace Center (DLR), Stuttgart

10.2012 - 09.2015 Software Developer (Student) at the German Aerospace Center (DLR), Cologne

Technical Experience

Programming Languages

C/C++: Most used language in my daily professional work, used for firmware development in different projects, e.g. for sensors, transmitters, robotics and IoT-Applications.

Java: Most used language for my private projects, e.g. used for development of an artificial intelligence for soccer robots.

Python: Used daily, e.g. for automating tasks, build systems, plotting, data analysis, etc.

And many more …

Other Experiences and Skills:

Project management	Project manager since 2013 at TIGERs Mannheim. Since 2022, CEO & Founder of PlainCore Robotics & Embedded Systems
Operating systems	Ubuntu, OSE (RTOS), ChibiOS (RTOS), FreeRT, Zephyr, Petalinux, Windows
Software	Git, SVN, Visual Studio, Jenkins, Gitlab, Sonarqube, IntelliJ, CLion, VisualVM, Common Office Tools, Polarion, Jira
Platforms	Zynq7000-Soc, STM32, MSP430, ATMega168

Other Qualifications:

- Certified Scrum Master (scrum.org)
- ISTQB® Certified Tester - Foundation Level
- Member of the Organizing Committee Robocup 2017
- Professional ZYNQ-7000 SoC (PLC2)
- Advanced C++ with Focus on Software Engineering (High Performance Computing Center Stuttgart)

RoboCup - Project

Description The student team “TIGERs Mannheim” from DHBW Mannheim has been participating in international RoboCup tournaments since 2011. The robots are completely self-developed and have to compete in a robot soccer match without any outside intervention. https://tigers-mannheim.de

Status **Member since 2012, Team Leader since 2013**

Activities

- Development in the field of artificial intelligence
- Organization of international events

- Task distribution and team management
- Support in the development and maintenance of the robots
- Marketing and sponsoring

Participation in Tournaments

- RoboCup 2023 France, 1st place, Best Paper Award, 1st place Technical Challenge, Excellence Award
- RoboCup 2022 Thailand, 1st place, Open Source Award, Best Paper Award, 1st place Technical Challenge
- RoboCup 2021 World, 1st place, Open Source Award, Best Paper Award, Excellence Award, 1st place Hardware Challenge, 1st place Technical Challenge
- RoboCup 2019 Australia, 4th place, Open Source / Hardware Trophy, Best Paper Award, Excellence Award
- RoboCup 2018 Canada, 3rd place, Open Source / Hardware Trophy, Best Paper Award, Excellence Award
- RoboCup 2017 Japan, Top 8, Open Source / Hardware Trophy, Best Paper Award
- RoboCup 2016 Germany, Top 8, Open Source / Hardware, Best Paper Award, first place Technical Challenge, Most improved Team
- IranOpen 2016, 4th place
- RoboCup 2015 China, Top 8, Open Source / Hardware Trophy
- IranOpen 2015, 4th place
- RoboCup 2014 Brazil, Top 8, Open Source / Hardware Trophy
- RoboCup 2013 Netherlands

Publications

- Geiger, M., Ommer, N., Ryll, A. (2023). RoboCup 2022 SSL Champion TIGERs Mannheim - Ball-Centric Dynamic Pass-and-Score Patterns. In: Eguchi, A., Lau, N., Paetzel-Prüsmann, M., Wanichanon, T. (eds) RoboCup 2022:. RoboCup 2022. Lecture Notes in Computer Science(), vol 13561. Springer, Cham. https://doi.org/10.1007/978-3-031-28469-4_23
- Andre Ryll, Nicolai Ommer, Mark Geiger (2021) RoboCup 2021 SSL Champion TIGERs Mannheim - A Decade of Open-Source Robot Evolution (submitted, yet to be published)
- Geiger, Mark (2019) On Target Heliostat Calibration using Locally Weighted Projection Regression for Trajectory Detection and Matching. Poster presentation, SolarPACES 2019.
- Geiger, Mark (2018) Preliminary Hazard Analysis and Fault Handling Methods in Solar Thermal Power Plant Control Systems. Master Thesis, University of Stuttgart.
- Geiger, Mark and Gross, Fabian and Buck, Reiner (2018) HeliOS Control System Virtually Operates a 100 MW Molten Salt Tower. In: AIP Conference Proceedings, 2033 (210006). SolarPACES 2017, 26.-29. Sept. 2017, Santiago de Chile. DOI: 10.1063/1.5067208
- Gross, Fabian and Geiger, Mark and Buck, Reiner (2017) A Universal Heliostat Control System. In: AIP Conference Proceedings. SolarPACES 2016, 11.-14. Okt. 2016, Abu Dhabi, AE. Java, Industrial Automation, Control Theory, Optimization, Control Systems Geiger, Mark (2017) Scientific and Simulation Data Management Systems (Review), University of Stuttgart.
- Team Description Papers for the RoboCup: https://tigers-mannheim.de/index.php?id=65
- Geiger, Mark (2017) Online Color Calibration for Vision based Pattern Recognition by using Locally Weighted Projection Regression, University of Stuttgart.

- Pfahl, Andreas and Coventry, Joe and Röger, Marc and Wolfertstetter, Fabian and Vasquez Arango, Juan Felipe and Gross, Fabian and Arjomandi, Maziar and Schwarzbözl, Peter and Geiger, Mark and Liedke, Phillip (2017) Progress in Heliostat Development. Solar Energy. Elsevier. DOI: 10.1016/j.solener.2017.03.029 ISSN 0038-092X (In Press) Geiger, Mark (2016) A review on additive manufacturing and cloud manufacturing methods, University of Stuttgart.
- Geiger, Mark (2015) Tesselation of Trimmed NURBS Surfaces using Multipass Shader Algorithms on the GPU. Bachelor's, Duale Hochschule Baden-Württemberg.
- Geiger, Mark (2014) Modellierung von Klappen und Kontrollflächen in der Geometriebibliothek TiGL. Other, Duale Hochschule Baden-Württemberg.

Languages

- German (native)
- English (fluent)
- Vietnamese (basic)

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