

Volker Floeder

Software Development Consultant

Project Manager + Team Lead + Architect

Developer + Analyst

System improvement and optimization regarding embedded systems, especially concerning stability, performance and maintainability.

Maintainable architecture for safety- and security-critical products - like autonomous driving - using modern C++.

Software used in autonomous road vehicles must comply with the ISO 26262 (part 6) standard which puts limitations on the usage of C++. However, knowing about implementation details of the language and the standard library as well, it is often possible to keep the advantages by adapting data structures and algorithms in a way that makes them fully compliant to the standards.

For maximum system utilization, it is not sufficient to look for optimal algorithms, but to use such that perform best under the constraints of the underlying (hardware-) system.

Personal Details

Name Volker Floeder

Address Haydnstraße 22
27570 Bremerhaven, Germany

Education Details University of Hamburg, Germany

Mathematics: Combinatorics, Design Theory, Graph Theory, Numerical Methods

Computer Science: Software Design, Operating System Design, Programming Languages, Compiler Design, Optimal Algorithms

Areas of Specialization Autonomous Driving, Digital Maps / Navigation, ADAS, Software Design especially Cross-Platform & -Architecture including Validation & Verification, Object Oriented Design, Multi-Threading, Distributed Systems

Selected Skills

Project Management	Team Building & Mentoring, Project Scheduling, Client Relations & Presentations, Risk-Management, Assessments, Greenfield Projects
Coaching	<p>Introduction of Cross-Plattform Tools (CMake, GNU, LLVM), Libraries (wxWidgets, GigaBASE) and Methodologies for Binary and Sourcecode compatibility (Dynamically Loadable Modules with Standardized Interfaces vs. Conditional Compilation and Generic Programming)</p> <p>Software Architecture regarding Cross-Platform Development, i.e. Layered Design, Functional Programming, Message-based Communication, Client-Server Architecture for Distributed Systems.</p> <p>Hardware in the Loop / Software-Simulation to test and analyze early.</p> <p>Software-Metrics, Code-Reviews. Audits and Assessments.</p>
Architecting	<p><u>Analysis:</u> Rapid elicitation of System Requirements through Use-Case Analysis and Non-Functional Prototypes</p> <p><u>System Design:</u> Data Modelling, System Design Specification, Interface Control Specification, Performance Analysis, Algorithm-Complexity, Pattern-Driven Design, Domain-Driven Design, Intention-Revealing Interfaces</p>
Software Engineering	<p><u>Languages:</u> C++17 (with MISRA C++), C, Assembly Languages, Python, Shell-Script, UML, XML, JSON</p> <p><u>Systems:</u> Linux, Windows, QNX, VxWorks, RTOS-Kernel</p> <p><u>Libraries:</u> C++ Standard Lib (STL), Boost 1.6x (asio), wxWidgets 3.x, TinyXml 2.x, GigaBASE 3.9, MySQL 5.x, QT 4.x, wpa_supplicant 2.x, Procol Buffers 2.x, nanomsg</p> <p><u>Tools:</u> Visual Studio, gcc, clang, MinGW, VTune, Parallel Studio, Purify / Quantify / Coverage, Insure++, Valgrind, Dr. Memory, Clang-Sanitizer, Subversion, Git, CMake, Jenkins, Jira, Confluence, BugZilla, Trac, TestRail, Polarion, Enterprise Architect, CLion, Coati, Wireshark, Understand 3.x, Typora</p>
Protocols	TCP/IP, UDP, HDLC, RLP, CAN, ADASIS, NMEA 0183
Methods	Agile Software Development, Scrum, Extreme Programming / Pair Programming, Test Driven Development, V-Model, Generic Programming
Languages	German: Native English: Full professional proficiency
Hobbies and Interests	I am a Hovercraft enthusiast and licensed pilot for a <i>Small Sized Commercial Hovercraft</i> carrying up to 12 people in near-shore coastal waters.

Professional Experience

Since 1999	Floeder IS GmbH Founder and CEO
Field	Autonomous Driving, Advanced Driver Assistance Systems, Digital Maps, Car Navigation, Embedded Linux, Mobile Communication, Software Technology
Customers	Audi, Blaupunkt, BMW, DKS-Köln, Daimler, Ford, HarmanBecker, Höft&Wessel AG, Ibeo AS, Intermap, MAN, Nokia(Navteq), Opel, Porsche, Siemens, TomTom(Tele Atlas), Valeo, Vorwerk, ZF

Projects

- Since 2018 Software Architect Autonomous Driving
Fully autonomous driving solution for public transportation systems. Combines different sensor technologies to support a digital environment enabling autonomous driving in public traffic.
Role: Lead Software Architect, Software Specification and Review, Mentoring
Enterprise Architect + Polarion + Jira + Confluence + Linux (4.x) + ROS + C++17 + Boost + protobuf + doxygen + Jenkins + Git + CLion + Sourcetrail + Cppcheck + Valgrind + Understand
- 2017 - 2018 Automotive Telematics Control Unit
Incorporating geolocation (GPS, Glonass) and mobile telecommunications (2G/3G/4G) technologies. Providing connected in-vehicle services, regarding safety and security such as eCall, Era-Glonass and Stolen Vehicle Recovery.
Role: Senior Consultant - Embedded Linux Developer and Architect.
Embedded Software, 3G/4G Communication, Software Specification, Implementation and Verification. Consulting and Mentoring.
Embedded-Linux (3.x) + Yocto + Jenkins + C++11/14 + Boost + JSON + Git + ClearQuest + Clang sanitizers + CppUTest + CLion + Sourcetrail + Cppcheck Valgrind + Shell-Scripting
- 2015 - 2017 Kitchen Appliance
Twelve Functions Kitchen Appliance that can mix and cook all at the same time, featuring recipe chips, touchscreen, Wifi connectivity with a unique Guided Cooking function.
Role: Senior Consultant - Embedded Linux Developer and Architect: System improvement especially regarding Wifi-Connectivity and other Low-Level functionality.
Embedded Software, Wireless Communication, Software Specification, Implementation and Verification. Consulting and Mentoring.
Embedded-Linux (2.6.35) + LTIB + Yocto + Freescale-Toolchain + Jenkins + Shell-Scripting + C/C++ + Guiliani + ARM9 (Freescale MX28EVK) + Subversion + Polarion + GoToMeeting + Google Test + Understand + Enterprise Architect + UMLet + wpa_supplicant
- 2014 - 2015 Video Monitoring for Public Transportation Systems
Video streaming and recording system for train systems, featuring in- and outside camera systems, alarming and more, letting the driver oversee what is going on.
Role: Senior Consultant - Embedded Linux Developer and Architect: Improvement of stability of communication between components of the distributed system.
Consulting, Mentoring, Embedded-Software, Wired Communication, Software-Specification and Verification
Embedded-Linux (2.6.32) + Yocto + Angstrom-Toolchain + Shell-Scripting + C/C++ + QT4 + dbus + ARM7 + U-Boot + Subversion + Video-Streaming

- 2013 - 2014 Mobile Communication Device
Mobile communication device for shunting to replace analog radio by GSM-R.
Role: Senior Consultant – Principal Software Architect: System improvement and optimization, especially regarding stability, performance and maintainability. Consulting, Mentoring, Embedded-Software, Mobile Communication, NAND-Technology, Metrics, Software-Specification, Verification and Reviews
20 MM: Embedded-Linux (2.6.38) + Kernel-Driver + Angstrom-Toolchain + Shell-Scripting + C/C++ + Windows Embedded + QT4 + JFFS2 + UBIFS + dbus + ARM9 + U-Boot + Multi-Threading + Subversion + GSM-R + BugZilla + Trac + TestRail
- 2006 - 2012 RAPS, ADAS, digital maps
Low latency / real time electronic-horizon provider to be used in map-based driver assistance systems. One of the first available systems worldwide and still the only one that works with all available maps. Runs on several operating systems and implements unique features like **Context-Based Road-Matching**, **Turn-Prediction** and dynamic length of the predicted path. Used by Daimler, Ford, MAN and ZF.
RAPS obtained a funding of € 700,000 in 2009 by Innovationsstiftung Hamburg.
Role: Principal Software Architect – Project-Manager: Multi-Platform Build-Environment, User-Interface, Positioning, Road-Matching, Route-Prediction, Inter-Process and Network-Communication, GPS and CAN-Bus Interface, Optimized File I/O, Digital Map Format, Multi-Threaded Pipelined Backpatching Compiler-Engine, Lexical Analyzer, Parser, Plugable Code Generators
84 MM: Project Management + Mentoring + Software Metrics + Windows / Linux, 32 / 64 Bit + C++ + STL + wxWidgets + GigaBASE + Multi-Threading + Purify/Quantify/Coverage + Git + CAN + ADASIS V2 + NMEA 0183 + Digital Maps + ADAS + Navigation + Client/Server + Templates + Exception Handling
GDF-Import
Fast map compiler. Two hour compilation time on a single workstation, where others need two weeks on a server farm.
- 2007 - 2008 Wireless rear view camera for trucks (prototype only)
Role: Principal Software Architect
- 2001 - 2006 Car Navigation / Digital Maps
Role: Principal Software Architect
- 1999 - 2001 Windows Tools
Role: Principal Software Architect and Project Manager