

Volker Floeder

Software Development Consultant

Software- + Solution-Architect
Developer + Analyst

Nowadays software is the driving force in most product developments. The old fashioned development strategies are no longer sufficient to manage and safeguard current and future requirements - especially regarding security, safety and maintainability. However, a scientific-technical approach does help to tackle the problem.

Development for critical products often has to match standards that put limitations on the usage of devices and programming languages. However, knowing about implementation details of the language and the associated libraries, it is in many cases possible to keep the advantages by adapting data structures and algorithms in a way that makes them fully compliant to 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

Location 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

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

Selected Skills

Project Management Team Building & Mentoring, Project Scheduling, Client Relations & Presentations, Risk-Management, Assessments, Greenfield Projects

Coaching Introduction of Cross-Platform Tools (CMake, GNU, LLVM), Libraries (Boost, QT, wxWidgets, GigaBASE) and Methodologies for Binary and Sourcecode compatibility (Dynamically Loadable Modules with Standardized Interfaces vs. Conditional Compilation and Generic Programming)

Software Architecture regarding Cross-Platform Development, i.e. Layered Design, Functional Programming, Message-based Communication, Client-Server Architecture for Distributed Systems.

Software-Metrics, Code-Reviews. Audits and Assessments.

Architecting **Analysis:** Rapid elicitation of System Requirements through Use-Case Analysis and Non-Functional Prototypes

System Design: Data Modelling, System Design Specification, Interface Control Specification, Performance Analysis, Algorithm-Complexity, Pattern-Driven Design, Domain-Driven Design, Intention-Revealing Interfaces

Software Engineering **Languages:** C++17 (with MISRA C++), C, Assembly Languages, Shell-Script, UML, XML, JSON, YAML

Systems: Linux, ROS, Windows, QNX, VxWorks, RTOS-Kernel

Libraries: C++ Standard Lib (STL), Boost 1.6x (asio, archive, pool), wxWidgets 3.x, TinyXml 2.x, GigaBASE 3.9, MySQL 5.x, QT 4.x, wpa_supplicant 2.x, Procol Buffers 2.x, nanomsg, OMQ, cryptopp

Tools: Enterprise Architect, CLion, Sourcetrail, Wireshark, Understand 3.x, Visual Studio, gcc, clang, MinGW, VTune, Parallel Studio, Valgrind, Dr. Memory, Clang-Sanitizer, Subversion, Git, CMake, Jenkins, BugZilla, Trac, TestRail, Typora, Polarion, Jira, Confluence

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 **Small Sized Commercial Hovercraft** carrying up to 12 people in near-shore coastal waters.

Professional Experience

Field	Process Optimization, Autonomous Driving, Advanced Driver Assistance Systems, Digital Maps, Car Navigation, Embedded Systems, 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, Volkswagen, Vorwerk, ZF

Projects

- Since 2022 Designing the leading tech stack for the automotive industry
Transition from an Engineering- to a Software-Centric Business.
Role: PMT Architect - Solution Architect regarding Processes, Methods and Tools: Efficiency and Effektivness in Systems- and Software-Engineering Environments.
Consulting, Mentoring, Metrics, Best-Practices, Standards, Verification and Reviews.
Enterprise Architect + ArchiMate + Confluence +, Jira + MISRA + Autosar + ISO26262 + Yocto + C + C++ + CMake + Conan + Github + Static Code Analysis
- 2020 - 2022 Realtime Audio Analyzation Device
System for detection and analyzation of sound sources.
Role: Senior Consultant – Software Architect and Developer: Board-Support-Package iMX8M Yocto 2 and 3 featuring high throughput, low-latency, stability and maintainability. Industrial IO and ALSA device drivers, architecture of the user-space audio analyzation app including implementation of critical software parts.
Consulting, Mentoring, Embedded-Software, Metrics, Software-Specification, Best-Practices, Verification and Reviews
QNX 7.0 + QNX Neutrino for i.MX 8M + Embedded-Linux (4.x, 5.x) + Yocto (sumo, Zeus) + SAI + ALSA + IIO + C++17 + Boost + Git + GitLab + Jenkins + GoogleTest + Audio
- 2018 - 2019 Software Architect Autonomous Driving
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.
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: 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.
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, Multi-Threaded Pipelined Backpatching Compiler-Engine
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.
- 2007 - 2008 Wireless rear view camera for trucks (prototype only)
Role: Principal Software Architect
- 2001 - 2006 Car Navigation / Digital Maps
Role: Principal Software Architect