

Atanas Rusev

Senior Freelancer C/C++ Embedded Software Engineer

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Born: 4. Nov 1983
Marital Status: Single
Citizenship: Bulgarian
Driving License: Yes, cat. A, B

1. Short Experience Summary

SW Development

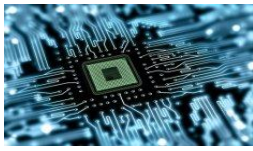
- **Languages and methods:** **C** for Embedded systems (15+ years, Expert), **C++** (7 years, good), **Python** (3 years, good), **Makefiles** (4 years, good); **V-Model** (8+ years, Expert), **Agile** and **Scrum** (5 years, good)
- **IDEs** and main **tools:** **MSVC**, **Clang**, **QtCreator**, **Eclipse**, **CMake**, **GCC**; others: IAR, Greenhills MULTI, WinIdea, KEIL uVision, Code Composer Studio, Open OCD, gdb
- **Version control** and **merging:** **GIT**, **SourceTree**, **GitKraken**, PTC Integrity, **SVN**, Microsoft **Source Safe**, Serena **Dimensions**; Beyond Compare, Araxis, Diff, etc.
- **Linux** and **Open source** fan, worked with: **Linux Fedora**, **Arch**, **Mint**, **Ubuntu** and **Manjaro**
- **Framework:** Long-year experience with RTOS, test and simulation frameworks
- **Algorithms:** Developed multiple algorithms for **data processing** and **manipulation** – from **Low Level Drivers** to **High-level generic algorithms**
- Excellent knowledge of: **Drivers**, **RTOS**, **Bare Metal**, **Low Level** development - design of optimized **minimum resource** drivers; knowledge of **registers**, embedded **MCUs** and **DSPs**
- Excellent knowledge for **Low Level Drivers** (7+ years) – worked with and developed: CMOS, USB, I2C, NVRAM, FEE, FDL, Graphics and Image DSP Embedded Drivers

System Design

- Design of platform independent testing framework for sorting algorithms along with data generation for it
- System Design, **Architecture** design and decisions, **API** Design, V-Model (10 years)
- **Algorithms** and state machines (**FSM**) - design with maximum efficiency and multiple **Zero-Defect Components** delivery, several times with additional development of **testing suite** (10 years)
- Developed SW Architectural **Speed** and **Resource optimizations** in multiple projects
- Developed **Data Security** / **Sustainability** Strategies
- Design of **Data Manager architecture** for Automotive ECU, full implementation, testing and team leading

HW Related

- Excellent understanding of electronics schematics and Hardware/Software Documentation (**Bachelor** and **Master Eng. Of Electronics**)
- **12+ years** of experience in working with **HW** - Oscilloscopes, Measurement equipment, soldering electronic components, etc.



Security:

- Performed analysis and designed process for SW distribution to third parties
- Performed research on SW encryption tools for PC based SW with plugins, chosen and implemented algorithms
- Integrated AES encryption and designed additional obfuscation for exposed proprietary data, developed decoding application and full chain test

Automation:

- Design of Sorting algorithms test data generation for automatic test framework integration
- Design of Automated ARXML API and Source Code Generation System
- Design and Development of CMOS Driver Test Application for PIL and HIL on Target Testing through JTAG

Team Leading:

- Experienced in multiple projects in Planning, Task allocation, Task progress monitoring, Milestones monitoring
- Senior Engineer, promoted to informal Team Leader multiple times, promoted to integrator
- Performed trainings for new-comers in multiple projects
- Defined project and team targets in multiple positions

Testing:

- Experienced with SIL, Embedded HIL and Embedded PIL testing
- Design and developed multiple Functional Unit Tests Suites for applications and major components
- Developed Complete product functionality tests and API Tests

ISO Experiences:

- Worked with SPICE Process ISO 15504 for 5 years
- Developed process according to ISO 27001 (Information Security Management System)
- Got certificate for ISO 26262 (Functional safety, FuSa) in 2015

Documentation:

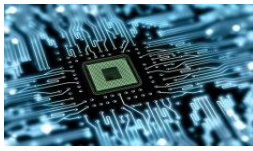
- Long time experience in writing **Requirements**, **Design** and **Architecture** documentation, also **procedure** and **HowTo** documents
- Experienced in **Versioning**, **SW Releases** preparation, Definition of **Integration** changes, Monitoring of **Milestones** completion
- Long time experience in writing, reviewing and working with formal Requirement and Customer Specifications

Soft Skills

- Task estimation and task distribution in team, work planning according to project needs
- Excellent Time and Task management Abilities
- Excellent communication skills based on 14+ years of experience in international teams and projects, visited 15 countries, speaking 3 foreign languages (English, German and Spanish)
- Team player with firm target for constant Self Development

Articles and projects:

- <https://atanasrusev.com/articles/>
- <https://github.com/AtanasRusevPros/>



2. Project Listing

**07/2020 – until now: Senior Software / Algorithms Engineer with C/C++
Huawei Munich Research Center**

Project Description:

Development and testing of new and adapted algorithms based on OpenCV and DFT and few other open source libraries; Complete new implementation for Turbo Encoding / Decoding FEC based on AFF3CT and ITPP Open source libraries

Tasks:

OpenCV / DFT:

- Development of custom geometric-based manipulation of Y-channel and application of custom masks in different combinations in YUV converted video stream
- Performance measurements and evaluation of video-manipulation algorithms
- Investigation of applications methods and multiple implementations of Eulerian Motion / Color Magnification for video streams
- Development of custom adapted implementation of Eulerian Color Magnification
- Development of encoding and decoding of data, performance measurements, optimizations
- FFT, DFT and IDFT on separated YUV channels and analysis of data
- Investigation of basic filters applications (IIR, FIR, blur, Low/High/Band-pass Laplacian Pyramid)

AFF3CT:

- Integration and testing of AFF3CT C++ template-based framework for Turbo Code tests
- Investigation of ITPP library based Turbo Code implementation, developing full replacement based on AFF3CT
- Development of custom Turbo Code algorithm based on AFF3CT - reduction of 10 levels of templates to single-classes implementation
- Development of custom encoding and decoding methods
- Investigation of memory leaks, performance, debugging and testing on multiple algorithms
- Preparation of detailed performance statistics and optimization both for efficiency and resources

Tools:

- MSVC 2019, Git, Sourcetree, Bitbucket, Clang, CMake, C++14/17
-

**04/2020 – until now: Senior Software Engineer with C/C++
Triple Helix LLC**

Project Description:

Development of completely new universal sorting algorithm with full scale Open Source testing framework, performance comparison with over 20 existing high-efficiency algorithms / implementations

Tasks:

- Designed complete test framework together with concept and strategy
- Developed multiple experimental algorithms
- Developed test data generator and automatic integration of it in framework
- Compared with as much as possible algorithms, write documentation and full project documentation
- Pending – publication of both SW and documentation, build on Linux, test on multiple platforms

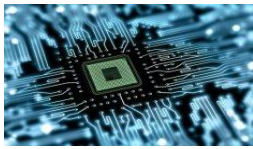
Tools:

- MSVC 2019, GCC, Clang, QtCreator, C, C++11
-

**02/2020 – 03/2020: Senior Software Engineer with C/C++
Triple Helix LLC**

Project Description:

Manjaro Linux on Raspberry Pi 4B with Touchscreen - Installation, setup, writing full setup documentation



Tasks:

- HDD partitioning, boot and installation
- Choice of cooling solution with full documentation
- Package Managers review, BASH basics manual
- Basic setup, Kuman 7 inch Capacitive Touchscreen display drivers setup
- Link: <https://atanasrusev.com/category/manjaro-linux-on-raspberry-pi-4/>

Tools:

- Manjaro Linux, BASH, partitioning, pacman, pamac, Raspberry Pi 4B
-

**04/2019 – 09/2019: Senior Automotive Software Engineer with C++
Veoneer GmbH, München (through Cyres Consulting GmbH, München)**

Project Description:

PC SW Encryption, ISO27001 implementation and SW Architecture basic Redesign

Tasks:

Security:

- Investigation of security workflow
- ISO27001 process documentation development:
 - Security flaws analysis, Development and business supply chains roles allocation, distribution of security related features
- Codemeter WiBu SW Encryption solution integration
- Investigation of Windows SW for proving encryption durability

Data encryption SW development:

- Performed explicit logging library profiling
- Investigation of encryption algorithms and implementation of AES (128 bit PCBC) with additional custom obfuscation
- Investigation of Open Source libraries for encryption / decryption, integration and tests development
- Development of decryption application and complete test suite for encr./decr. chain
- Full integration documentation

Major Windows PC Application redesign:

- Investigation of current DLL based architecture, definition of new targets, tasks and milestones
- Thread Pool design, implementation and integration
- Investigation of flaws, Investigation and design of new data processing pipeline
- New architecture with migration from Qt/DLL plugins to pure C++11 with STL functions in a monolithic application
- Investigation of Open Source Thread Pools limited to C++11
- Developed a Thread pool Open Source library, <https://atanasrusev.com/2019/09/13/thread-pool-design-pattern/>
- Development of documentation and guidelines

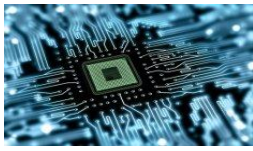
Tools:

- C++11/14, Microsoft Visual Studio 2015, Dependency Walker for Win64
 - Codemeter AxProtector, Codemeter License Editor, PE internals Windows analysis SW
 - Hex Editor for PC application analysis, Beyond Compare, PTC Integrity, GIT, QtCreator
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**02/2019 – 04/2019: Senior Automotive Software Engineer with C / Python
Veoneer GmbH, München (through Cyres Consulting GmbH, München)**

Project Description:

Build System Development for ADAS Project



Tasks:

- Development of CMake, Makefiles and Eclipse CDT based Make system
- Written manual for Eclipse and MinGW usage, setup, importing, debugging, etc.
- Investigation of LDRA Tool suite usage, setup of MISRA checks, interpretation of results, console usage
- Written manual for LDRA
- Found issues in LDRA, was the contact person with LDRA support and IT department
- Developed Python scripts for batch commands, MinGW compilation, LDRA jobs, Jenkins

Tools:

- Eclipse, Makefiles, MinGW, CMake, GCC, LDRA Tool suite
- Python, Windows Batch Scripts, Jenkins, Beyond Compare

**10/2018 – 11/2018: Senior Embedded Software Engineer
YehiOr Bulgaria Ltd**

Project Description:

RnD for HW / SW Development and architecture for consumer electronics device

Tasks:

- Development of Requirement Specification
- Investigation of Linux based HW platforms for SW development. Comparison and investigation of CPU, RAM, HW interfaces, existing libraries, support, ports of Linux based OSes
- Verification of further transfer of the designed device to a custom designed platform
- Development of basic SW architecture – OS tasks, SW Components, Drivers and Applications
- Investigation of potential LCD Displays considering price, characteristics and prototyping
- Chosen Arch Linux for development

**04/2018 – 08/2018: Senior Automotive Software Engineer with C
Behr Hella Thermocontrol (BHTC Lippstadt) via Eeins GmbH Stuttgart**

Project Description:

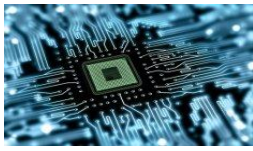
C based Autosar project for advanced Seat Heater functionality on advanced Climate Control ECU

Tasks:

- Requirements analysis and validation
- Design of advanced algorithm (3-level nested algorithm with state machines) for learning user habits and controlling further the seat heating on a fully automated basis considering car, profile and environmental conditions
- Investigation of use case scenarios and contradictory conditions
- Design of data management including reset and optimization
- Investigation and development for NVM and calibration parameters, transfer of mathematical equations to C code, design of results validation
- Investigation of required interfaces, alignment with integrators and team for component integration
- Design of full logging functionality for tracing of algorithm execution with additional log decoding tool
- Development of full internal Requirements Specification and a complete design document
- Matched complete traceability between customer specification, internal SRS and final design documentation according to ASPICE, design of basic test and validation procedures
- Conducted the complete end customer discussions for features, requirements and mathematical clarifications throughout the project

Tools:

- Eclipse, Greenhills Compiler, GIT (with GitKraken), Kanban, Agile Methodology
- Renesas E1 debugger, CANoe, Autosar



**01/2018 – 02/2018: Senior Automotive Software Engineer with C
Valeo GmbH, Stuttgart, via Eeins GmbH Stuttgart**

Project Description:

C based Autosar project for advanced parking assistance system for Renault

Tasks:

- Ticket burn down
- Investigating internal and customer defect reports
- Debugging diagnostics related issues, investigating signals distribution and dependence, checking implementation against requirements
- Simulating parking scenarios
- Made detailed DEM and NVM driver check with investigation of write times, latencies and configuration. Made timing reports, checked redundant blocks writing and triggering. Proved NVM state machines, found issues and proposed fixes that were accepted
- Investigating SW execution paths, tracing signals and Autosar RTE transfer through state machines

Tools:

- WinIdea, Greenhills Compiler, IC5000 iSystems debugger
 - Custom Simulation HW, CANoe, Eclipse, DOORS, Autosar, Agile process
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**09/2017 – 12/2017: Senior Automotive Software Engineer with C
Valeo GmbH, Stuttgart, via Eeins GmbH Stuttgart**

Project Description:

C based Autosar project for advanced parking assistance system for Ford

Tasks:

- Ticket burn down before final release
- Investigating internal and customer defect reports
- Debugging diagnostics related issues – made complete investigation of diagnostic framework and activation
- Simulating parking scenarios
- Investigating SW execution paths, tracing signals and data transfer between state machines
- Checking calibration parameters: map, implementation, setting and getting

Tools:

- WinIdea, Greenhills Compiler, IC5000 iSystems debugger
 - Custom Simulation HW, CANoe, Eclipse, Diagnostic SW, Autosar, Agile
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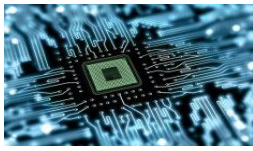
**01/2016 – 04/2017: Senior Automotive Software Engineer with C++
Valeo GmbH, Stuttgart, via Eeins GmbH Stuttgart**

Project Description:

C++ based project for Road Laserscanner Device with development force in 4 locations and with approx. 200 developers

Tasks:

- Investigation of test environment, developing testing procedures and manuals for team of 12 freelancers
 - Development of functional SIL tests in Qt based SW environment for unit and functional testing
 - Testing of complex components for geometrical calculations, objects build and detection
 - Developed two custom data generators for coordinates and road objects simulation
 - Developed several test frameworks for different components with custom data generation and templates specialization handling
 - Requirements writing and review
-



- Writing of design and architecture documents, Code refactoring
- Planning of tasks, managing team assignments, doing work load and timing estimations
- Writing HowTo and procedures documents, performing training for newcomers

Tools:

- QtCreator, Eclipse, DOORS, Serena Dimensions, Enterprise Architect
- Agile Methodology + Scrum , Excel for complex trigonometric functions

**09/2015 – 12/2015: Senior Automotive Software Engineer with C
Marquardt GmbH, Rietheim-Weilheim, via Eeins GmbH Stuttgart**

Project Description:

C based Autosar project for Battery Management Controller ECU (BECM) for Audi/Porsche

Tasks:

- OBD2 diagnostic testing according to VW/Audi specifications
- Development of OBD IUMPR support (In-Use Monitor Performance Ratio)
- Setup of DaVinci Configurator IUMPR settings
- Requirements validation

Tools:

- WinIdea, Windriver Compiler, DaVinci Configurator
- IC5000 iSystems debugger, Custom Simulation HW, CANoe, Eclipse

**04/2015 – 09/2015: Senior Automotive Software Engineer with C++
Valeo GmbH, Stuttgart, via Eeins GmbH Stuttgart**

Project Description:

C++ based project for Road Laserscanner Device

Tasks:

- Team Tasks distribution and estimation of efforts, project planning for freelancers
- Development of Technical Documentation according to SPICE standard
- Development of SW Unit Tests for complete Template based C++ library
- Development of Process Documents for the freelancer team

Tools:

- QtCreator, Eclipse, DOORS, Serena Dimensions, Enterprise Architect, PRQA QAC, Agile

**12/2014 – 04/2015: Senior Automotive Software Engineer with C
Valeo GmbH, Stuttgart, via Eeins GmbH Stuttgart**

Project Description:

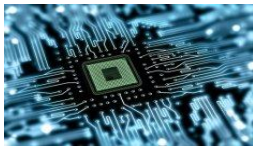
C based Autosar project for Automotive Park Assistance System

Tasks:

- Debugging and development of Park System Logic based on specifications
- Debugging of Use Case scenarios and HIL testing
- Research and debugging of memory overwrite bugs related to compiler specifics and memory overflow issues

Tools:

- WinIdea, Windriver Compiler, IC5000 iSystems debugger
- Custom Simulation HW, CANoe, Eclipse



**06/2012 – 09/2014: Senior Automotive Embedded Software Engineer with C
Leopold KOSTAL GmbH & Co. KG, Sofia, Bulgaria / Dortmund, Deutschland**

Description:

Autosar 4.0.3 / RTOS Door ECU for Volvo with Renesas MCUs, Framework Design and Development for a complete series of devices

Tasks:

- Development and Design of SWCs for Autosar System with V850 MCU
- Design and development of ECU Framework – for data distribution, Variant Management, interfaces distribution for 2 main devices – one based on V850 MCU and the other on RL78 MCU
- Migration of SWCs to non-Autosar RTOS ECU system
- Development process analysis for the design of Automated API Generation for Data Management
- Requirements Specifications analysis
- Research for ARXML generator for import of CS / SR Ports APIs in DaVinci Developer
- Research for ARXML generator for import of NvRAM/EEL/FDL BSW driver configuration in DaVinci Configurator
- Integration of SWCs in Autosar Environment
- Software design for Data Handling by critical Voltage Drop
- Design of Sustainability, Security Strategies and Data Restore by NVRAM HW/driver failure
- Design and development of Variant Management Application for complete System Configuration
- Development of LIN protocol for Configuration Transfer to Rear ECUs
- Development of CAPL nodes for Variant Configuration and Simulation
- Design and Development of NvRAM driver communication Layer
- Integration of FEE / FDL Libraries
- Unit Tests Design and development
- Test and Debug on Target, SIL, PIL and HIL Tests
- Written full DOORS Documentation
- Responsible in Bulgarian office for HW consumables purchases and measurement instruments
- Successful Development of Zero Bugs SWCs (confirmed 1 Month after end of the project)

Tools:

- Eclipse IDE, Greenhills MULTI IDE, IAR IDE, SmartSVN, DOORS, Serena SBM Teamtrack
- PRQA QAC, DaVinci Developer & Configurator, CANoe, CAPL, CAN, LIN, Oscilloscope
- Autosar 4.0.3, MISRA, ASPICE, SIL, HIL und PIL Testing

**05/2010 – 06/2012: Senior Automotive Software Engineer with C/C++
Johnson Controls Inc. (now Visteon), Sofia RND Center, Bulgaria**

Project 1 Description:

C/C++ API Library for Test connection between USBn PC Test SW and TCP connected QNX Target for Infotainment System

Tasks:

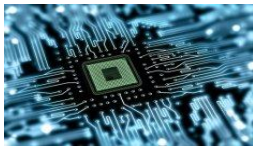
- Development of C API Library
- Development of C++ Windows GUI Plugin
- Development of automated Test for +50 Functions API
- Writing SDD Specification and HowTo Document

Tools:

- Microsoft Visual Studio, C, makefiles, Dimensions, MISRA PRQA QAC

Project 2 Description:

Instrument Panel Cluster with Dual-Processor-Architecture for General Motors with Integrated Infotainment Functions / Features



Tasks:

- Development of C / C++ Applications with Unit Tests
- Requirements Analysis
- Design of Alert Manager Multi Thread Application (for 480 Alerts from 16 Classes)
- Design and Development of GUI Sender Application
- Design of Automated Test for Alerts Applications Suite
- After an year promoted to Software Integrator
- Main responsible for SW Releases and Updates, Creation of Implementation Reports and Versions Bug reports
- Communication with Resident Engineer (India) and Management Team (USA)
- Writing Software Specification Documents

Tools:

- Eclipse IDE, DOORS, GDB, CANoe, Agile Methodology, Scrum, Kanban
- MISRA PRQA QAC, CAPL, CAN, MOST Simulation, MOST Inspector

**11/2009 – 05/2010: Senior Embedded Software Engineer with C/Python
Antelope Audio (Elektrosfera), Sofia, Bulgaria**

Description:

Design of Embedded SW of a USB Audio DAC and a Python based GUI for Windows PC and MAC (Macintosh / Apple)

Tasks:

- USB Driver Debugging and USB Bus Communication Analysis
- Framework debugging
- Development of Python based GUI with PyQt
- Development of two Software Installers – one for Window PC and one for MAC
- Development of MAC C++ Application for USB Driver connection for iOS with Python GUI

Tools:

- Eclipse with PyDev and PyQt, XCode IDE
- Atmel ARM7 Debugging with Wiggler Jtag and Open OCD
- Tortoise SVN, Oscilloscope, USB Bus Analyser

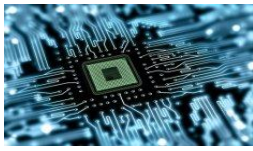
**12/2006 – 09/2009: Senior Embedded SW Engineer and Team Leader - Sensor Drivers with C
MM Solutions, Sofia, Bulgaria**

Description:

Embedded Imaging Application Software for Nokia Mobile Phones with Texas Instruments ARM7 Image DSPs and proprietary RTOS – Development of Framework and drivers

Tasks:

- Development and design of CMOS Drivers
- Framework Development and Design
- Tutoring/Training Junior Developers
- Test Team leader, Definition of Test Team Tasks
- Responsible for Customer contact for several projects. This included tracking and update of specifications, determining development schedule, preparing client updates, conduction of weekly calls with the client for project status update
- Preparation of Implementation Reports and Test Status reports
- Design of automated On Target SIL and HIL Driver Tests
- Design of complete V-Modell circle in SW Development
- 6 Projects successfully finished and sent to market



Tools:

- Code Composer Studio, Eclipse, WinMerge, C, makefiles, Source Safe, Microsoft Office
- RTOS measurements via Debug (CPU Load, RAM / ROM, Stack, etc.).
- Oscilloscope, SPI, I2C, Custom test IDE for scripted tests
- Agile Methodology

**07/2006 – 11/2006: Development Engineer of Automotive ICT Tests
 Epiq Electronic Assembly, Botevgrad, Bulgaria**

Description:

Development and Design of In-Circuit-Testers Programming for Automotive Electronics Production

Tasks:

- Analysis of Customer HW Documentation
- Development and design of Automated ICT (In-circuit Test) Tests, Waste Analysis

Tools:

- Marconi Testers ICT IDE, Oscilloscope

3. Education

<p>Oct 2006 – Sept 2009</p>	<p>Master (Dipl.-Eng.) Engineer of Electronics (Embedded Devices) Technical University of Sofia, Faculty of Electronics Thesis: "Development of USB Embedded System Communications protocol for control of Embedded Device from PC"</p>
<p>Oct 2002 – Sept 2006</p>	<p>Bachelor Engineer of Electronics (Embedded Devices) Technical University of Sofia, Faculty of Electronics Thesis: "Design of FGPA / VHDL based System for Laser Measurement of Physical Dimensions"</p>
<p>Sept 1997 – May 2002</p>	<p>High school - Instituto Bilingue "Miguel de Cervantes" Specialty Fields: Mathematics, Spanish</p>

4. Language Skills

- **German** : Good
- **English** : Fluent
- **Bulgarian** : Native
- **Spanish** : Good

5. Certifications

- **Automotive Functional Safety Professional** according to ISO26262. Certified by SGS TÜV SAAR GmbH on 07.08.2015, Certificate Number 01057, valid until 17.07.2018