

Dipl. Ing. Elektronik

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Freelance Embedded Software Engineer

Germany
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OBJECTIVE

Forward looking, energetic team player with get things done attitude is looking for challenging freelance software architect/developer or test/verification positions.

Creative and versatile individual with extensive experience in software development for real-time, embedded platforms developed in the automotive, defense, medical, energy and network/mobile telecom industries.

Expert in real-time-multitasking embedded systems as well as in the architecture, development and verification of large and complex software projects.

KEY SKILLS

Programming Languages	C++, C, ARM assembler, Renesas H8 8-bit CPU assembler, Intel Assembler
Microcontrollers / CPUs	ATMEL ARM Cortex-M4 and M3 Microcontroller, Renesas H8 8-bit CPU, FXTH870x6 Tire Pressure Monitor Sensor
Protocols	BLE, J-PAKE, M-Bus, TCP/IP, UDP, SNMP, Frame Relay, BSC, HDLC, SDLC, RS-232, RS-422
Operating Systems	Linux, VXWorks RTOS, Nucleus RTOS, UNIX System V
ICE's, Debuggers	IAR Workbench, Lauterbach-Trace32, DDD (Data Display Debugger), XRAY Microtec debugger, Intel-I2ICE-emulator, Kontron-emulator, HP real time C debugger
Software Development Methodologies	Software Design Patterns, Fagan software review method, UML, Use Cases
Software Tools	Visual Studio, Requisite Pro, KlocWork Misra, EA Enterprise Architect, TestTrack, Perforce, GIT, Subversion SVN, Rational Rhapsody, Qmore, Rational Rose, ClearCase, Rational Purify, ClearQuest, Tornado Suite, Sniff Suite, Source Navigator, SAX XML parser, STL
Network Technologies	RMON MIB, LAN, GBIC, Ethernet , TCP/IP
Wireless Technologies	Bluetooth Low Energy (BLE), UMTS, W-CDMA, HSDPA, HSUPA, RX-TX Diversity, Dual SIM
Software Development Standards	IEC 62304 medical device software, Software Functional Safety, MISRA, RTCA-DO178 Mil. Standard, DOD 2167 Mil. Standard

ACHIEVEMENTS

- **Patent awarded** "Fast search algorithm for mobile phones dynamic memory allocation" for NXP (ex-Philips Semiconductors) Nuremberg, Germany.

EXPERIENCE

Consultant Embedded Software Architect / Developer	Medical Devices Company, Denmark	06-2019 / Present
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Project: Portable Drug Infusion Pump

- UML architectural and detailed design, implementation according to medical industry standard IEC 62304 of embedded, functional safety class C software.
- Unit and integration tests plans and C++ implementation.

Skills: Architectural Design, UML Enterprise Architect, Design Patterns, C, C++, ATMEL AVR Microcontroller, IEC 62304, software functional safety, Risk Control Measures, software testing, MISRA, SCRUM, JIRA, GIT.

Consultant Embedded Software Architect / Developer / Tester	Automotive Components Company, Germany	03-2018 / 04-2019
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Project: Tire Pressure Monitoring System (TPMS)

- Software architecture extension; code size and energy consumption optimization; PAL, WAL, LOS pressure sensor wireless autolocation methods implementation.
- Hardware In the Loop (HIL) simulation wheel testing.

Skills: SW Architectural Design, C, 8-bit NXP FXTH870x6 Tire Pressure Monitor Sensor, GIT extensions, HIL, PAL, WAL, LOS, SCRUM, Microsoft TFS.

Consultant Embedded Software Architect / Developer	Solar Inverter Energy Company, Germany	10-2017 / 02-2018
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Project: Solar Inverter Safety Processor for Grid Feeding Control

- Software architecture adaptations, implementation of HAL (Hardware Abstraction Layer) for ADC (temperature, phase voltage). PWM (relays control), electrical grid control State Machine.

Skills: Architectural Design, UML, C, ARM assembler, NXP LPC2134 ARM7 CPU, Functional Safety, GIT extensions.

Consultant Embedded Software Architect / Developer	Medical Devices Company, Germany	04-2017 / 10-2017
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Project: Android porting to a point of care handheld medical device

- Software porting architecture, implementation of Android HAL (Hardware Abstraction Layer), for display/touch screen and camera services.

Skills: Architectural Design, Android, UML, C++, C, Linux, NXP i.MX7D dual ARM Soc processor.

Consultant Embedded Software Architect / Developer	Avionics Systems Company, Germany	04-2016 / 12-2016
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Project: Platform Independent Planning System

- Architecture, detailed design, implementation of OSAL (Operating System Abstraction Layer), for airborne navigation planning systems using UML, embedded Linux, C++11.

Skills: Architectural Design, UML EA Enterprise Architect, C++11, Linux, Design Patterns.

Consultant Embedded Software Architect / Designer and Test Verification Engineer	Roche Diabetes Care, Germany	02-2015 / 03-2016
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Project: Insulin delivery pump

- Detailed design, implementation, test/debugging, according to medical industry standard IEC 62304, of embedded C , functional safety class C, software for Bluetooth Low Energy (BLE) application protocol interface.
- Detailed design, implementation of a Flash memory wear levelling device driver on ATMEL ARM Cortex-M4 Microcontroller.

Project: Insulin delivery pump software test and verification

- Designed and developed C# and Python black box test cases for the BLE communication interface, application protocol layer, analyzing system requirements. Performed fault analysis, regression tests.

Skills: Architectural Design , UML Enterprise Architect, Design Patterns , C, C#, Python, Bluetooth Low Energy (BLE), ATMEL ARM Cortex-M4 Microcontroller, flash memory wear levelling device driver, IEC 62304, software functional safety, black box software system testing, MISRA, J-PAKE.

Consultant Embedded Software Design / Test Verification Engineer	Landis+Gyr, Germany	04-2014 / 12-2014
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Project: Electronic Smart Meter

- UML /unit tested/integrated embedded C for ATMEL ARM Cortex-M3 Microcontroller for the serial communication interface application layer subsystem using the M-bus communication protocol. Used real-time multitasking Linux-like kernel. Reverse engineered Renesas H8 8-bit microprocessor assembler.
- Designed/developed (MMI) Man Machine Interface display component.

Skills: UML, Design Patterns, C, M-bus , ATMEL ARM Cortex-M3 Microcontroller, Renesas H8 8-bit microprocessor, assembler, black/white box software testing, RTOS kernel.

Consultant Embedded Software Design Engineer	Achelos, Germany	12-2013 / 03-2014
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Project: Secure Java Card Feature

- Involved in the feature design according to the java card 3 platforms, runtime environment specification.

Skills: Java card 3 platforms, runtime environment specification standard.

Consultant Embedded Software Verification Test Engineer	Intel Mobile Communications, Germany	08-2011 / 09-2013
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Project: HSDPA, HSUPA, Dual Sim, Rx-Tx Diversity features

- Designed and developed C++ black/grey box test cases for new UMTS Layer 1 (L1) mobile phone embedded firmware features analyzing system requirements. Performed requirements reviews, fault analysis, regression tests execution on simulator and HW target.

Skills: C++, black/grey box software testing, UMTS Layer 1, HSDPA, HSUPA.

Consultant Embedded Software Engineer	Advantest, Germany	11-2009 / 07-2011
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Project: Industrial ATE system

- C++ software UML design and implementation of a simulated HW chips for a data measurement subsystem based on the SAX framework XML parser. Used Linux RTOS, STL library, various software "Design Patterns", Eclipse SDK.

Skills: UML, Design Patterns, C++, Linux, black/grey box software system testing, SAX framework XML parser, black box system testing.

Consultant Embedded Software Engineer	Siemens Medical, Germany	09-2008 / 09-2009
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Project: Responsible for UML software design and development of calibration and image conditioning for a x-ray scanner medical device

- Definition and analysis of use cases starting from system requirements. High level and detailed UML object orientated design with C++ code generation using the Rational Rhapsody IDE . Debugging using QNX Momentics IDE.
Used QNX real-time multitask RTOS.

Skills: UML Rational Rhapsody, Design Patterns, C++, QNX RTOS, IEC 62304.

Principal Embedded Software Engineer	NXP (ex Philips Semiconductors), Germany	2004 / 2008
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Project: Responsible for design, development and maintenance of proprietary mobile phone real-time kernel

- Definition and analysis of use cases with internal stakeholders in France.
- High level and detailed object orientated design of POSIX i/f features using software "Design Patterns".
- MISRA compliant embedded C and ARM assembler development, host and target tests using DDD and Lauterbach-Trace32 debugger.

Project: Embedded LINUX kernel porting on a mobile phone system board

- Successfully ported the Linux kernel serial console and memory management subsystem (ARM MMU).

Skills: UML, C, Linux kernel, Design Patterns, ARM MMU, MISRA, RTOS kernel.

Senior Embedded Software Engineer	3Com Europe, UK	1998 / 2004
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Project: VXWorks embedded real-time diagnostic hardware device driver component for a L3 LAN Switch

- Definition and analysis of use cases requirements using Rational Rose.
- High level and detailed object oriented design using UML sequence diagrams, class diagrams realizing the defined use cases.
- Embedded C++, hardware device drivers coding carried out on Wind River Tornado/Sniff suite. Used XRAY Microtec ICE for target testing/debugging.

Project: Gigabit Ethernet LAN switch derivative projects

- Object oriented design, C/C++ coded and tested embedded hardware device driver for GBIC transceivers with real time "hot swap" detection capability. Employed inter-task communication primitives of an in house RTOS. Used XRAY Microtec ICE for target testing/debugging.
- Responsible for the development, test and maintenance of the Broadcast Storm Control, Resilience and 802.1p traffic prioritization features.

Project: Router expansion module hardware device driver interface for Ethernet LAN switches

- Requirement definition, Object oriented design and embedded C/C++ coding of the software interface for detecting and managing the cold-swap router module;

Skills: UML, C, C++, Design Patterns, TCP/IP, UDP, LAN, Ethernet, Wind River WxWorks.

Senior Embedded Software Engineer	Metrodata Ltd., UK	1996 / 1998
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Project: CDX packet tunneler hardware device driver from E1 to frame relay protocols

- Design and C object oriented coding of four RS-422 ports frame relay embedded hardware device drivers using the HDLC protocol to generate Frame Relay packets. Used XRAY Microtec ICE for target testing/debugging.

Skills: C, Nucleus RTOS, RS232, HDLC, Frame Relay.

Project: PC based system for navigation systems laboratory calibration

- Design and C++ coding of the IEEE- 488 and RS-422 hardware device drivers.
- Coordination of a team, schedule definition, implementation of embedded software development quality assurance activities according to the Litton, Italy standards.

Project: EUROSAM - Inertial land navigation system for missile launching platforms

- Firmware requirements definition/analysis (OOA methodology), design (HOOD methodology) and object oriented C coding for I/O hardware device drivers in an embedded INTEL 80386 card (Inertial Reference Unit communication subsystem with two RS-232 SDLC and two BSC protocol interfaces).

Project: Inertial land navigation system for German tanks

- Firmware requirements definition/analysis (OOA methodology), design (HOOD methodology) and object oriented C coding for I/O hardware device drivers in an embedded INTEL 8086 card (Inertial Reference Unit communication subsystem with three BSC protocol interfaces).
- Implementation in C of an embedded device driver for the GPS serial data acquisition subsystem

Skills: C, C++, OOA, OOD, RS232, RS-422 SDLC, BSC, GPS, RTCA-DO178, DOD 2167.

EDUCATION AND QUALIFICATIONS

- **MS Degree in Electronics** - University of Rome, "La Sapienza", Italy, Dept. of Engineering, specialization in Electronics/Software Engineering, five years course study; final grade 110/110 (i.e. 110 points out of a possible 110).
- **Project Management** – Course attended at Philips.
- **Languages** –
 - German, intermediate;
 - English, fluent (lived in UK for eight years, Cambridge First Certificate, Grade A);
 - Italian, mother tongue;