

#248

Senior Systems Architect. Year of birth 1975
Speciality: Architectural design and development of embedded software for complex systems

Work experience

- 2012 - Prevas A/S
Senior Systems Architect
- 2007 - 2012 Data Respons A/S
Systems architect. As a consultant, responsible for design and development of embedded systems.
- 2000 – 2006 Prevas A/S (formerly IO Technologies A/S)
Software designer

Competences

System development

- Software development for complex systems
- Wireless and cabled network and protocol design
- Linux: board support, drivers and application development
- Small scale and high-end embedded systems
- Interface protocols: Ethernet, USB, CAN
- Strong theoretical background in computer science and mathematics.
- High level of experience from numerous real-life embedded projects of all sizes.

Analysis and design

- System architecture covering hardware and software
- Requirement and test specifications
- HW/SW interface design for throughput and real-time performance
- Design and documentation for medical software

Tools and Technologies

- Linux: OE-lite, Yocto and others
- Qt
- The GNU compiler toolchain
- Build systems: GNU Make, ant
- Software configuration management: SVN, Git, bazaar, ClearCase, CVS
- MCU specific tools from Atmel, IAR, Green-hill and Lauterbach

Programming languages

- C, C++ for embedded systems
- Ruby, Python
- Unix scripting
- Java, JavaScript, Web technologies

Education

1994 - 2000 Danmarks Tekniske Universitet
Ms. Sc. Computer Science

Project references

XO-Care

December 2014 – January 2015

Linux-platform/graphical user interface for medical device.

- Technology: Embedded Linux, device drivers, JavaFX
- Responsibility: Platform design and development.

Undisclosed customer

July 2012 – January 2015

Medical device covered by NDA. A Linux-based device able to perform low-frequency sound recordings of a heart and complex mathematical analysis of the data. The device has a touch-screen user interface implemented in Qt, and an embedded analysis algorithm implemented in Matlab which is automatically translated into C code.

- Technology: Embedded Linux, device drivers, OMAP3, graphical user interface, Qt, Matlab, RFID, USB, Software for medical devices.
- Responsibility: Linux driver development and bring-up of BSP on custom hardware. GUI implementation.

AdvaLight

April 2012 – July 2012

Development of laser unit for the treatment of skin problems. Responsible for design and development of the graphical user interface using Qt and Linux.

- Technology: Qt, GUI design, Protocol design, Linux
- Responsibility: Implementation of GUI in Qt. Rework of interface protocol between boards.

CareCord

May 2011 – October 2011

System for monitoring of non-intensive care patients in hospitals. I was responsible for design and implementation of radio communication between gateways and monitoring devices.

- Technology: 802.15.4 radios running 6LoWPAN, AVR, battery powered device.
- Responsibility: Software architecture, wireless protocol design, back-end protocol design, designing and building prototypes.

Novo Nordisk

April 2010 – May 2011

Medical device covered by NDA. I was part of the development team implementing the system platform and graphical user interface. The technology in use was an ARM-based board with a medium sized display running uCOS.

– Technology: ARM-based device, GUI, wireless communication, USB, Software for medical device, unit-testing

– Responsibility: Development of application and drivers as well as documentation and unit-tests.

Novo Nordisk

May 2009 – June 2010

Tiny medical device for helping patients remember their medication. I was responsible for the software development, which included a USB device stack, low-power mode handling on a tiny microcontroller and an html/javascript based application for presentation of use data.

– Technology: AVR, low power device, USB, IR-communication.

– Responsibility: Primary developer of USB-device stack, main application program, IR-communication system and data presentation using html/javascript.

Focon / Ericsson

May 2008 – May 2009

Linux-based hotspot for the Danish IC3 trains. Based on custom-built Compact PCI rack with a PC running Linux. Responsible for developing the automatic configuration and firmware update system and the monitoring system.

– Technology: Linux on industrial PC. Wireless LAN, fail-safe upgrade and configuration of inaccessible systems. Health monitoring. HSDPA / GPRS communication.

– Responsibility: Design and implementation of upgrade system, configuration system and monitoring system. Involved in hardware bring-up and debugging.

Power Secure

February 2008 – May 2008

System for securing electronic equipment against theft.

– Technology: In-house developed RTOS, TCP/IP, embedded webserver, power line communication, html/javascript

– Responsibility: Design and implementation of embedded TCP/IP stack and webserver with support for interacting with platform, as well as design and implementation of the core application and the web-based user interface.

Frogne

December 2007

USB device stack for Intel XScale CPU running under VxWorks.

- Technology: USB device stack implementing CDC-ACM for interfacing towards development tools and service tools.
- Responsibility: Design and implementation.

KiSS / Cisco / Linksys

March 2007 – December 2007

High-end DVD player with media center capabilities

- Technology: Multi-processor Linux system running on MIPS and Marvell MV78100.
- Responsibility: Tool-chain setup (GCC), bring-up, U-Boot and Linux support for the MV78100.

Vestas

February 2007

Analysis of the real-time characteristics of Ethernet. A report on the possibilities of using off-the-shelf Ethernet hardware in a real-time environment.

CompAir

2005-2006

Control unit platform for a range of air compressors.

- Technology: ARM-based hardware, graphical display, hard real-time requirements, using LUA for state machine implementation.
- Responsibility: Software architecture, tool-chain setup (GCC), board bring-up, platform and driver development, embedding LUA in platform.

Brüel & Kjær Vibro

2006-2007

System for remote monitoring of wind turbine generators. Part of a team implementing the data acquisition system including data transfer over GPRS.

- Technology: Linux, ARM, GPRS, DSP/FPGA, TCP/IP networks
- Responsibility: Linux platform and drivers, implementation

OSIS

2007

System for detecting oil spills at sea. Responsible for implementing a new feature set in an existing mechanical platform.

- Technology: Linux, closed-loop control mathematics.
- Responsibility: Development of control software for the mechanical system

IO Technologies

2005-2006

Development of IO Technologies' second ARM-based CPU module running Linux. The module has an integrated FPGA used for custom designed I/O and as video controller for TFT-displays.

- Technology: Embedded Linux, hardware design, TFT-displays, toolchain setup, build system, configuration management.

- Responsibility: Hardware architecture and implementation of Linux platform and build system. Handling of prototype production.

DEIF A/S

2001-2004

Graphical user interface for setup and monitoring of a generator set controller.

- Technology: Embedded Linux, touch-interface, GUI design, MODBUS, TCP/IP.

- Responsibility: Design and implementation of drivers and application.

LINCO Food systems

2003

System for control of a weighing and sorting system used in the food industry. Part of a team porting the original system to a new platform. The system included distributed IO and control of industrial machinery.

- Technology: PowerPC, CAN, distributed I/O, industrial control

- Responsibility: Porting of original code base to new hardware platform.

IO Technologies

2000-2001

Generic ARM-based CPU module running Linux.

- Technology: Embedded Linux, tool-chain setup, bootloader development

- Responsibility: Porting of Linux for ARM-based s3c4530 processor in a time where ARM support in Linux was limited.

Competences (continued)**Programming languages**

- C, C++
- Ruby, Python
- Java, C#
- Pascal
- Bash, Lua, TCL
- Assembler: AVR, ARM, x86

Theoretical background

- Concurrent and parallel systems
- Complexity analysis
- Protocol design and analysis
- Algorithms and representation of data and knowledge

Tools and Technologies

- jEdit, ctags
- GCC, GNU Make
- Git, SVN, ClearCase, Bazaar, CVS
- Lauterbach, GDB
- Eclipse, Visual studio
- IAR Embedded Workbench
- Green-hill MULTI
- Qt

Operating systems

- Linux
- ThreadX
- FreeRTOS
- uCOS
- vxWorks
- Windows

Architectures

- ARM7, ARM9, Cortex M3, Cortex A8
- AVR
- PIC
- i386
- PowerPC