

Sassan Panahinejad

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Experienced in every aspect of embedded Linux, especially device driver, operating system and bootloader porting and development. 1st class degree in Computer Systems Integration (previously CRTS) from the University of the West of England.

Education and qualifications

University of the West of England

2008-2012

Modules studied

First year

Programming in C - General C programming skills in a Linux environment. Using data acquisition boards.

Computer systems architecture - Studying computer systems, networks. Designing and implementing network protocols.

Digital systems development - General electronics skills. Programming in assembler and C for PIC microcontrollers.

Digital design and instrumentation - General electronics skills. Use of electronic instruments (multimeters, oscilloscopes).

Foundation studies for software engineering - General software development skills, including project management, ethics, use of utilities (make, shell scripting, AWK, flex), Eclipse IDE, version control.

Program development in C# - Developing GUI applications in C#.

Second year

Embedded and microprocessor systems - Writing software in C and assembler for embedded StrongARM boards. Porting Linux to these systems.

Operating systems and network programming - Advanced programming under Linux/Unix. Using various low-level features of the operating system, developing network software.

CPU architecture and VHDL - Designing, implementing and testing CPUs. Programming FPGA devices using VHDL.

C++ programming - The C++ language and Visual C++ 2008.

Data structures and algorithms - Data structures such as linked lists, trees, etc.

Software design - Design of object orientated software, UML modelling.

Final year

Designing and writing device drivers

Advanced systems administration

Integrated case studies – Understanding the challenges of real-world embedded systems projects.

Embedded systems development – Working alongside standard software engineers to produce a system with both embedded and non-embedded components. Using the Gstreamer multimedia framework.

Building, porting and configuring embedded operating systems

Embedded co-design (vhdl & c) – Developing PWM and keypad controllers in VHDL, developing Linux device drivers for these controllers and working with roboticists to produce a software controlled robot arm.

Computing project – My final year project was an internet radio player. This project allowed me to explore and demonstrate my embedded Linux skills, working on all aspects of a project, from hardware selection to design and implementation. I also learned a great deal about extremely resource constrained embedded systems as to create a low-cost final product an extremely low end SoC was used.

Uckfield Community Technology College

Uckfield Community Technology College, Uckfield, East Sussex, TN22 3DJ

A-levels (2008) - Electronics (A), Physics (C), Applied ICT (D)

AS Levels (2007) - Maths (C)

GCSEs (2006) - Physics (A*), Maths (A), ICT (A), Chemistry (A), Biology (A), German (A), Statistics (B), Business Studies (B), English Language (C), English Literature (C), Resistant Materials (C) ½ GCSE Religious Studies (A).

Previous employment

Embedded software and security engineer - Mathembedded (2012 – present)

Work primarily on audio/video related devices such as TVs, set top boxes and automotive infotainment.

Work has included:

- Debugging large, in-kernel, audio/video systems. Including extremely complex memory leaks and lockups; Diagnosing and resolving audio glitches; Implementing a video error concealment mechanism; resolving AV sync related problems; Working around bugs/limitations of higher-level software to meet customer needs.
- Back-porting device drivers to SoC vendor supported kernels
- Boot time optimisation

- Operating system porting
- Security audits of embedded systems
- Security consultancy
- Developing and running security training courses

Several of these projects involved extensive on-site work with customers.

Embedded software engineer - MPC Data Ltd (2010 - 2011)

During a 12 month placement at MPC Data I gained extensive experience, primarily in embedded Linux, but also with QNX. My work included two large projects working on device driver development. One of these projects involved two weeks of on-site work with a customer and the other involved managing a small team.

I also worked on boot-speed optimisation, in one case as part of a larger project and in another as a project in itself.

I also worked on low-level application development, multimedia application development, QT UI development and system integration. Finally, in addition to my project work, I implemented systems performing backups of the company's website.

All of the projects were run to ISO:9001 quality standards, within a company that is also ISO:13485 certified, giving me experience working with strict quality standards.

Peer Assisted Learning leader (2009 - 2010) - University of the West of England.

Selected and trained by the university to assist first year students with studies and assignments.

Duties included: Planning and running sessions, debugging students' software, answering questions from students.

While performing this job, I became skilled in passing on my technical knowledge to others and in debugging software written by others.

Various freelance services (2006 - 2010)

Clients include: Ian Tasker (The Classical Music Network, Schoolsict); Uckfield Community Technology College

Web programming (PHP/MySQL). Integration of a diverse range of technologies, including payment systems, multimedia processing and indexing software.

Performance and security optimisation of all aspects of a large website, including database optimisation and cache system deployment. Running a successful training course in microcontroller programming.

Skills

Specialities:

- * Embedded Linux
- * Device drivers
- * Porting software/systems
- * Low-level software
- * Operating system porting and BSP development
- * Bootloader porting and development
- * Systems Integration
- * Security
- * Boot time optimisation

Familiar with the following technologies:

- * USB - professional experience developing host controller drivers; Hobby experience developing device drivers
- * WiFi - professional experience developing device drivers
- * I2C, SPI, SDIO - professional experience developing device drivers
- * DVB frontends - professional experience developing device drivers
- * Coprocessors and AV coders - professional experience debugging drivers
- * ARM, SH4 and X86 processor architectures
- * SoC internals
- * QT embedded

Other skills:

- * Some experience of QNX
- * Some experience of microcontroller-based projects (PIC, MSP430, ARM)
- * Working as part of a team and leading small teams
- * Running training courses
- * Quickly learning new skills, both on the job and through research

Languages:

- * Extremely thorough knowledge of C
- * Good knowledge PHP (and associated technologies such as MySQL, Memcache, Lucene)
- * Extensive knowledge of BASH scripting
- * Professional experience of C++
- * Experience of a number of other languages, including Python, C#, TCL, Basic, VB, Javascript, VHDL

Experienced with the following types of equipment/tools:

- * JTAG debuggers
- * Oscilloscopes and logic analysers
- * Bus analysers (SPI, I2C, USB, HDMI)
- * Signal generators (HDMI)
- * Software toolchains and other general tools for software development
- * Version control, particularly experienced with GIT.
- * Build systems, including OpenEmbedded, Busybox and PTXdist.

Professional experience developing, porting and debugging software on many types of device, including the following:

- * TVs and set top boxes
- * Automotive infotainment
- * A/V receivers/amplifiers
- * Video camera devices
- * Smart fridges, freezers, etc
- * VOIP phones