



Curriculum Vitae

Hannu Lyytinen

Email: hlyytine@kapsi.fi

Phone: +358-(0)40-6692069

Executive summary

I am an embedded expert working on both hardware and software domains. One can find me working on hardware design, writing low-level code to wake up the prototype, finding out the design mistakes in prototypes, adapting boot loader and Linux kernel to new hardware or developing FreeRTOS-based firmware for Cortex-M. The other side of me is often involved in DevOps things – designing containerized build system or source management system that can serve multiple projects and customers, for example. I have extensive knowledge of Linux run-time also, so my domain is typically “everything below applications and services”.

The role of hands-on architect describes my role best: I am involved in laying out the foundations for HW/SW projects and I often write the initial implementation of ideas. Quite often I handle the technical communication with customer and act as a tech lead. I am particularly interested in having satisfied customer relationships and opportunities for continued co-operation, so good code is not enough. Hence, my ideas always have a bit of sales-oriented thinking. Nevertheless, there is nothing more satisfying than being able to do Proof-of-Concept pre-sales demos: some quality time with an oscilloscope, a soldering station and a JTAG debugger, all the while being backed up by higher-level software from your team.

Skills

I have throughout understanding of embedded systems, starting from schematics to the application level. This includes all processors, from latest SoCs such as NXP i.MX8 via ARM Cortex-M to small 8-bit AVR microcontroller. The operating system could be Linux, RTOS or even just bare metal. Linux is very familiar to me, all the way up from kernel, syscall interface, C library, UNIX daemons and frameworks like D-Bus, Wayland or Qt. For microcontroller applications, I have extended GCC toolchains and fixed its bugs.

On the other end of scale, I have worked on the internals of the Qt toolkit and written UI code in QML or ported open source software from Linux to different BSD systems. Electronics has always been an important hobby for me and both analog and digital electronics are familiar to me. On my spare time, I also practice skills on welding and machining with my other hobbies.

At this point of career, listing all my skills would lead to incomprehensible list of acronyms and I can only ask the reader to view the section below for some of my work assignments.

Work experience

Univ. of Kuopio, Dept. of Computer Science, UNIX sysadmin, 1/2000 – 4/2010

Tasks: maintain Sun server hardware and software (Solaris), maintain network of 100+ Linux workstations, IBM AS/400 system operator, Linux authentication via Microsoft Active Directory

Techs: Sun hardware, Solaris, sendmail, Apache, NFS, NIS, Active Directory, Kerberos, centralized maintenance of Red Hat / Fedora workstations, kickstart installations, MATLAB support

Nomovok / Link Motion, Senior software developer, 5/2010 – 11/2018

Healthcare sector - patient monitoring system

Tasks: implement battery-operated remote monitoring wireless system for lifesupport devices

Techs: C, AVR assembly, hardware prototyping, ZigBee, low power, hardware debugging

Nokia - MeeGo tablet

Tasks: Connectivity software, HW adaptation, continuous integration, encrypted development platform

Techs: C, C++, u-boot, Linux kernel, Qt, QML, ofono, BlueZ, connman, D-Bus, OBS, LUKS, LVM, STE Novathor, x86

Internal project - Skype demo on MWC 2011

Tasks: Skype audio/video interface in Qt/QML UI via gstreamer

Techs: C, C++, Qt, QML, gstreamer, STE Novathor

Internal project - QML-based mobile OS

Tasks: Compositing window manager, hardware adaptation, continuous integration

Techs: C, C++, u-boot, Linux kernel, Qt, QML, D-Bus, wayland, OpenGL ES, NVIDIA Tegra

Japanese car manufacturer - multidisplay support with HTML5 app support

Tasks: 3D accelerated UIs over Ethernet, HTML5 browser engine integration

Techs: C, wayland, OpenGL ES, GTK+, WebKit, TCP/IP, Intel Atom

Japanese SoC manufacturer – big.LITTLE kernel support for Linux (“cluster migration”)

Tasks: move processes between power-efficient Cortex-A7 and faster Cortex-A15 based on system load

Techs: C, Linux kernel, Android build system

Italian partner - Lamborghini Huracán instrument cluster

Tasks: FW update over CAN, 60 fps graphics, boot time optimization, AUTOSAR integration, fail-safe indicators under 200 ms, picture-in-picture at 60 fps, FPGA-generated splash screen

Techs: C, C++, u-boot, Linux kernel, TI SYS/BIOS, Qt, QML, OpenGL ES, PowerVR, TI Jacinto5, FPGA, VHDL, hardware debugging

Internal project - L4Linux OpenGL support

Tasks: make OpenGL possible (modify Vivante GPU driver, extend L4Re environment) on virtualized Linux

Techs: C, L4/Fiasco microkernel, L4Linux, Linux kernel, OpenGL ES, Freescale i.MX6

Italian partner - Android boot time optimization for agricultural machines

Tasks: Android boot time optimization except the Java parts

Techs: C, ARM assembly, u-boot, Linux kernel, Android init, TI Jacinto6

Italian partner - general purpose computer for cars and agricultural machines

Tasks: fail-safe FW update, boot time optimization

Techs: C, u-boot, Linux kernel, TI Jacinto6, CPLD, VHDL, hardware debugging

Link Motion "Halti" carputer

Tasks: extend MCU GCC toolchain, boot time optimization, low power sleep / CAN wakeup in hardware, fail-safe FW update, SMPS design (solving thermal and low load efficiency issues)

Techs: C, u-boot, Linux kernel, bare metal programming, OBS, NXP i.MX6, NXP HCS12, schematics design, hardware debugging

Link Motion "Monza" carputer

Tasks: boot time optimization, secure HW partitioning, fail-safe FW update, hardware design (manufacturing support, 5 x 1 Mbps CAN subsystem, low power sleep, standards compliance)

Techs: C, u-boot, Linux kernel, FreeRTOS, bare metal programming, Yocto, NXP i.MX8, schematics design, hardware debugging

Symbio, Software architect, 11/2018 – current

Various customers

Tasks: containerized build system, source configuration management, fail-safe FW update, boot time optimization, early rear view camera, everything at and below the BSP layer

Techs: C, u-boot, Linux kernel, FreeRTOS, Yocto, NXP i.MX8, HW wakeup and prototyping

Education

M.Sc. in Computer Science (minors in physics and applied mathematics), University of Kuopio, 1998 - 2008

Publications

Designing and implementing an embedded Linux for limited resource devices, Lyytinen H., Haataja K., Toivanen P., The Eight International Conference on Networks, IEEE Computer Society, 2009