

MARCUS FOLKESSON

EMBEDDED LINUX ARTIST

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SOCIALS

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SUMMARY

My passion in my profession and what drives me lies in being involved in the development of new hardware, clever troubleshooting, board bringups and finally creating a custom Linux system with all the drivers and facilities the customer needs to develop their product.

I have worked as a consultant for the last 14 years and that is something that fits me perfect. It allows me to be part of this early development that I find so interesting. It also allows me to see many different types of industries that place different demands on the system. I have developed Linux systems for both civil and military applications, systems in the automotive industry and the medical industry, all of which have different requirements.

In addition to the technical sphere, I have many non-technical interests as well. I enjoy doing beekeeping, leatherwork, blacksmithing, gardening and much more.

Linux Hardware design Beekeeping

COMPANIES I HAVE WORKED FOR

MAY 2022 → *Present*
(2 years, 2 months)

Freelancer at MFOConsulting AB, Habo, SE

Due to all inquiries I get about doing freelance assignment, I've started my own company. I do small well-defined freelance assignments. Typical assignments involve writing a Linux driver for a particular piece of hardware, debugging or pure consultation for embedded Linux systems.

APR 2010 → *Present*
(14 years, 3 months)

Embedded Linux Specialist consultant at Combitech AB, Jönköping, SE

I'm working as a technical leader for the Embedded Linux Area. My role is to maintain specialist knowledge in this area so that we can take on difficult assignments with high confidence. This maintenance involve to have courses(Combitech Embedded Linux course), talks (e.g. buildsystem-talk / git-talk) attend conferences (mostly Embedded Linux Conference), predict trends and keep filling this pool of knowledge. Also produce business plans for how to capture the customer's needs and quotation work.

JUN 2008 → AUG 2009
(1 year, 2 months)

Software developer at Kapsch TrafficCom AB, Jönköping, SE

Worked in parallel with the university studies and developed the Linux platform for the Video and Sensor department for the new generation of automotive classification stereo cameras.

JUN 2007 → SEP 2007
(3 months)

IT Technician at PDB DataSystem AB, Jönköping, SE

As an IT technician, I work both with internal technology solutions and various customer assignments. The work includes configuration of software and hardware, installations and network support.

EDUCATION

AUG 2007 → OCT 2010
(3 years, 2 months)

B.Sc.E.E specialisation in Electronics Design at JTH¹, Jönköping, SE

Focus on hardware design, real-time systems and programming. Started an electronics association for students and ran it during and after the studies.

¹School of Engineering, Jönköping University

MISSIONS I HAVE CARRIED OUT

JUN 2024 → *Present*
(1 month)

Linux Specialist at Saab Training Systems, Jönköping, SE

[Linux kernel drivers](#) [BSP](#) [Buildroot](#)

I work with the same Software Defined Radio (SDR) as I did in 2011. This time to rework and modernize the complete system and add support for features such as GNSS, WiFi and Bluetooth.

APR 2023 → *Present*
(1 year, 3 months)

Linux Specialist at ITAB, Jönköping, SE

[Linux kernel drivers](#) [BSP](#) [Docker](#) [Azure](#) [Yocto](#)

I belong to the embedded team where we develop a common hardware platform for future checkout and gate systems. In addition to all BSP and low-level development, the platform make use of iotedge with Azure for everything product-specific. The platform could be kept general when it leaves the production line as the function is determined when it ends up in a physical product and connects to the cloud. Pretty neat.

JAN 2024 → FEB 2024
(1 month)

Linux specialist at Fusion CCTV, INC, US

[OpenWRT](#)

I created a OpenWRT feed package for libcamera&OpenCV to be used with MediaMTX. It required host targets for a couple of packages in the openwrt-packages repository, changes that are submitted to mainline.

OCT 2022 → JUN 2024
(1 year, 8 months)

Linux specialist at Dosell, SE

[Linux platform](#)

Supporting role in the development of the new product generation of a pharmaceutical robot. The work was to setup the Linux system with respect to the customer requirements.

SEP 2022 → JAN 2023
(4 months)

Linux specialist at Contrinex, AU

[Linux kernel drivers](#)

Debug kernel driver for a parallell camera interface. We found the bug and got a stable camera stream.

JAN 2023 → FEB 2023
(1 month)

Linux specialist at Amrai, NL

[Hardware](#) [devicetree](#)

Review hardware design and devicetree nodes for Audio configuration.

MAY 2022 → JAN 2023
(8 months)

Kernel hacker at Minto.ai, India

[Linux kernel drivers](#)

Extended feature support in the MCP3911 kernel driver that I maintain. Also add support for the whole MCP39xx family. The new features added was:

- Support for buffers
- Support for interrupts
- Support for oversampling ratio
- Support for set PGA

The end result is now in the mainline.

AUG 2021 → JAN 2024
(2 years, 5 months)

Linux specialist at Greenworks, Jönköping, SE

[Linux kernel drivers](#) [BSP](#) [Cameras](#) [Yocto](#) [Bootloader](#) [AWS](#)

Created the BSP for for a custom hardware for the new high end series of robot mowers. The Linux platform is based on iMX8MM and iMX8MP SoM:s. The work included driver development for e.g. LoRA communication and USB drivers.

- AUG 2020 → AUG 2021
(11 months) **Linux specialist at SVP Woldwide**, Jönköping, SE
Linux kernel drivers BSP Bootloader
Created the BSP for the new high end sewing machines (Pfaff ICON 2). The platform include cloud connectivity, projector, camera and drivers for several different sensors and actuators.
- JUL 2019 → APR 2020
(9 months) **Embedded developer at Saab Training Systems**, Huskvarna, SE
Bare metal MSP430
Created a new replacement part for a speaker in a tank system to play different gun shots sounds. The old one was from the eighties so it was time for an upgrade. The choosen MCU was a MSP430.
- NOV 2018 → APR 2020
(1 year, 4 months) **Linux specialist at Husqvarna AB**, Huskvarna, SE
Linux kernel drivers BSP Bootloader
Developed the BSP for a service tool which is used to service most of Husqvarna's products. The custom hardware was based on iMX6ULL and has a lot of various communication interfaces to be able to communicate with the entire product flora.
- AUG 2018 → AUG 2020
(1 year, 12 months) **Linux specialist at Kapsch TrafficCom AB**, Jönköping, SE
Linux kernel drivers BSP Bootloader security
Developed the BSP for the Linux system of a new automotive ECU EVK with GNSS and V2X (Vehicle-to-Everything) capabilities. The EVK was a fun project as it was a complex system and all functionality should be exposed to the end user in a secure, limited and isolated way. It was based on a V2X processor from Auto-talks.
- AUG 2017 → AUG 2018
(11 months) **Linux specialist at Kapsch TrafficCom AB**, Jönköping, SE
Linux kernel drivers DSRC BSP Bootloader Power Management
Created the BSP for the new DSRC OnBoard Units (OBUs) used for tolling. A set of new drivers were developed for including display, fuel gauge and tampering. The product was based on iMX6UL. High focus on power management.
- NOV 2016 → AUG 2017
(8 months) **Linux specialist at SAAB Training Systems**, Huskvarna, SE
Linux kernel drivers iMX6 BSP Bootloader
New product generation for a tank system with the same i.MX6 platform as before. The new generation means above all a transition from Windows CE to Linux in which the application was developed Rhapsody. My job is to give the platform the same functionality as the previous generation and to be a support at the porting. This system must also act as master in the same CAN system as before, which has even higher requirements for timing and determinism in the driver, something we managed to achieve.
- FEB 2015 → NOV 2016
(1 year, 9 months) **Linux specialist at SAAB Training Systems**, Huskvarna, SE
Linux kernel drivers iMX6 BSP Bootloader
We developed a track light that sits in vehicles used with military training equipment. I was responsible for choosing the platform and ensuring that it lives up to the requirements the project sets with regard to real time and startup time. The platform is also intended to be the main track for future product generations. The election of platform ended up on the i.MX6 from Freescale. The work covers the entire Linux platform with a customized distribution and Linux kernel. A lot of focus around the driver for the CAN controller because it has hard real-time requirements in order to work with other systems, something we managed excellently.
- OCT 2014 → FEB 2015
(4 months) **Linux specialist at Tylö Helo**, Tylösand, SE
Linux kernel drivers BSP Bootloader
Development of Linux kernel drivers for a new revision of PCB to the control panel of sauna heaters. Such drivers include LCD, touchscreen and WiFi-module.

- OCT 2013 → NOV 2014
(1 year, 1 month) **Linux specialist at SAAB AB**, Husqvarna, SE
Linux kernel drivers Zynq BSP Bootloader FPGA
Research project where we developed a method for distance measurement and spatial navigation using only one mono camera. I was responsible for the custom hardware platform based on the Zynq 7000 SoC. Example on tasks is Linux customizing, driver development for IMU, camera and custom IP:s.
- SEP 2013 → MAR 2014
(5 months) **Software developer at Husqvarna AB**, Husqvarna, SE
Linux
Concept development of visual technics for robot navigation.
- MAY 2013 → SEP 2013
(4 months) **Linux specialist at Electrolux**, Ljungby, SE
Linux Driver development
Develop an USB driver for handle USB-to-serial communication faster than the regular driver. The current implementation of USB Communication Device Class (CDC) was too slow for efficient program loading over serial, so we made a driver that where about 140x faster than the original driver. The driver was verified to work on both Windows and Linux machines.
- JAN 2013 → JUN 2013
(4 months) **Software developer at Husqvarna AB**, Husqvarna, SE
Linux
Concept development of technical solutions for robot positioning.
- JAN 2013 → DEC 2013
(10 months) **Linux specialist at Kapsch TrafficCom AB**, Jönköping, SE
PowerPC Devicetree
After client migration efforts to lift the kernel version to 3.2 of their camera device, it became a problem to regain full functionality. Much has changed in the kernel for PowerPC architecture, where among hard introduction of device trees, changes in the DMA framework and so on. My work is to get everything to work with the new kernel and supporting the team in Linux-related issues.
- JAN 2013 → MAR 2013
(1 month) **Linux specialist at SAAB**, Husqvarna, SE
Boot time
Investigate what can be done to minimize the startup time of an embedded system with Linux. The report makes clear what changes affecting hardware and software. The study used HawkBoard (OMAPL138) and a BeagleBoard-xM (Cortex-A8) for testing and verification.
- DEC 2012 → MAR 2013
(2 months) **Git advocate at Autoliv**, Vårgårda, SE
Git
The assignment consists of acting as a sounding board through their migration work to Git from SVN/MKS. The customer wants to use Git together with Gerrit for audit and review management.
- OCT 2012 → MAR 2013
(4 months) **Linux engineer at Electrolux**, Ljungby, SE
BSP SDK
Helping the customer to set up a proper development environment and associated scripts for automating build processes and configuration of their custom Linux platform.
- OCT 2012 → DEC 2012
(2 months) **Linux engineer at SAAB Training Systems**, Huskvarna, SE
PREEMT_RT Boot-time
Continued to work on the SDR platform, this time with focus on the application layer, boot time and the PREEMT_RT patchset.

SEP 2012 → OCT 2012
(1 month)

Linux specialist at VSM Group, Huskvarna, SE

Linux kernel drivers iMX23 Bootloader

I helped VSM Group during two intensive weeks to get their new Linux-based hardware platform (iMX23). There were several problems but one of the biggest was that Linux nor Barebox did support their NAND flash. I implemented that support. The result is mainlined.

MAR 2011 → OCT 2012
(1 year, 7 months)

Linux engineer at SAAB Training Systems, Huskvarna, SE

Linux kernel drivers ARM9 BSP Bootloader DSP GMSK

I work in a team developing a Software Defined Radio (SDR) from a custom hardware platform based on an OMAPL138 processor from Texas Instruments. The platform uses Linux as the operating system and my primary role is to build on the Linux platform and train staff in embedded Linux. It was a cool project overall. All signal processing was performed by the DSP (C6000) controlled by the ARM. A flexible assignment with a lot of focus on device driver development, hardware programming and power management.

AUG 2010 → MAR 2011
(6 months)

Linux engineer at Minesto, Gothenborg, SE

Linux kernel drivers ARM9 BSP Bootloader Microchip PIC16/PIC32

Working with software and systems integration for the customers tidal water power plant Sea Kite II.

Getting the control system in written in Simulink to execute on custom hardware based on PXA270 with Linux as operating system.

Creating BSP and developing Linux kernel drivers for sensors, actuators and CAN-controller.

TEACHING EXPERIENCE

AUG 2010 → **Present**
(13 years, 11 months)

Course leader at Combitech AB, Jönköping, SE

Course manager for Combitech's Embedded Linux course. I have been responsible for holding and developing the course for the past 13 years. The goal of the course is to give a practical insight into how to develop drivers for Linux and interface the driver from a self-written userspace application. The course is highly appreciated by the participants.

OCT 2010 → DEC 2010
(2 months)

Guest lecturer at Jönköping University, Jönköping, SE

I guest lectured on Open Source and different licensing forms for students in the Electronic Design programs and Embedded Systems. The lecture was part of the System Design course.

OCT 2007 → JUL 2009
(1 year, 9 months)

High school teacher at John Bauergymnasiet, Jönköping, SE

In collaboration with Microsoft's partner program IT Academy, I have taught two classes in Programming A, B and C (course code: DTR1207, PÖVA1408 and PÖVA1409) in the programming language C# and C. I also taught a class in database management (course code: DTR1211) in Microsoft Access and MySQL. The work included:

- Planning course layouts
- Plan and implement lectures and laboratories
- Construct written material that corresponds to lectures
- Construct practice and submission tasks as well as exams
- Grade according to results on assignments and exams

DATA & TECHNOLOGY PROFICIENCY

PROGRAMMING LANGUAGES: C (mother tongue) – C++

EXPERTISE: Board bringups – Linux kernel programming – Open source development – Device drivers

LANGUAGES

SWEDISH
Native

ENGLISH
Fluent

SPANISH
Basic

OPEN SOURE CONTRIBUTIONS

BAREBOX:	Extend NAND flash detections to new MLC chips
BR2-READONLY-ROOTFS-OVERLAY:	Maintainer of this project
BUILDROOT:	Maintainer of several packages and scripts
CONNMAN:	Added support for VLAN – Various bugfixes
CRIU:	Introduce architecture specific flag to the build system
EUDEV:	Various bug fixes
KAS:	Minor fixes
LIBCAMERA-APPS:	Minor fixes
LIBOSTREE:	Introduce SPDX to the project – Various bugfixes
LINUX KERNEL:	Maintainer for several device drivers – Various bugfixes
LINUX-MAN-PAGES:	Minor fixes
META-READONLY-ROOTFS-OVERLAY:	Maintainer of this project
MMUTILS:	Various bugfixes
MODEMMANAGER:	Support for new hardware
OPENSFH:	Various bugfixes
OPENWRT:	Various fixes
POKY:	Minor fixes
QT-CREATOR:	Bugfixes for remote process debugging
SELINUX:	Rewrote most parts of the build system
SWUPDATE:	Minor bugfixes
SYSTEMD:	Minor fixes
ZEPHYR:	Maintainer of some drivers – Various bugfixes

UNRELATED FUN FACTS

- 2023: Started my own leather crafting side business, [Moosefall Supplies](#)
- 2022: Started my own freelance business, [MFOConsulting AB](#)
- 2019: Got my hunting license
- 2017: [Top5 SELinux Userspace Contributor Sep2017-Aug2018](#)
- 2017: First time I attended the Lund Linux Conference
- 2016: Got my HAM radio license, call me @SA7MFO
- 2016: Got my first beehives
- 2016: Third child
- 2014: First year I attended the Embedded Linux Conference
- 2012: Second child
- 2011: The degree project was nominated for the Wimansk prize, which is the Swedish Engineers' annual award for the best degree project at university engineering level
- 2011: First contribution to the Linux Kernel
- 2010: First child
- 2010: Scholarship for excellent academic results from Jönköping University
- 2009: Second place in Swedish championships in Robot-wrestling (minisumo class)
- 2008: Got my motorcycle license. Vroooooom
- 2007: Scholarship for best network technician of the year from John Bauer high school