

JAKOV PETRINA TRNSKI

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PROFESSIONAL EXPERIENCE



Byte Lab

Embedded Software Engineer

MAY 2025 – Present

- Lead Engineer on a next generation AI-enabled compact traffic sensor product for a Belgium joint venture featuring Rockchip RK3576 and Yocto-based operating system. Adapting Image Signal Processor (rkisp), Automatic Image Quality (rkaiq), NPU (rknpu2), and the Linux video stack (v4l2, ffmpeg, gstreamer) to work with RAW CMOS Omnivision OV5647 and OV13850 cameras.
- Lead Engineer on a PLC remote monitoring product for an established U.S.-based client with [Blues Notecard](#) – LTE Cat 1 bis connectivity, and [Blues Starnote](#) – satellite failover.
- Resolved a hardware watchdog issue in the [OP-TEE operating system](#) on the STM32MP133F platform with OpenSTLinux (Yocto-based) firmware. Set-up software for EMC and RF testing.
- Developing software for products based on [Zephyr RTOS](#) / [nRF Connect SDK](#) as well as bare-metal firmware for the STM32F4 (ARM Cortex-M4-based) microcontroller family.
- Worked on implementing low-level DSI and LTDC support for the STM32L4 (ARM Cortex-M4) MCU family to drive graphical display.



FOGO Development

Freelance Engineer, Co-Founder

APRIL 2024 – JUNE 2025

- Business development and client support
- Working for a UK-based client to develop a network orchestrator for the SONiC switching platform with OpenWiFi access-point hardware.



Sartura

Senior Embedded Firmware Engineer, Team Lead

JUNE 2020 – APRIL 2025

- Led a team of 5 engineers delivering embedded Linux solutions deployed on +100,000 devices based on OpenWrt, Buildroot, Yocto, and proprietary firmware such as QCA Software Development Kit (QSDK) and [Marvell's Routing Operating System \(ROS\)](#).
- Chief architect and developer of an [open-source Gentoo-based firmware build system](#) targeting the entire stack – routers, network switches, servers, and virtual machines.
- Guided the [porting of 802.1x \(port-based NAC\) feature](#) for dentOS v3.0, the DENT Foundation project under the Linux Foundation, a network OS for whitebox (disaggregated) switches.
- Completed a full initial [migration project of the dentOS from OpenNetworkLinux / SONiC to the Yocto build system](#), including a BSP layer and distribution layer, in 6 months.
- Lead engineer for a United States-based telco client subcontracting for the U.S. military, delivering OpenWrt firmware for a +2000 access point deployment.
- Designed and built from scratch an [automated testing system based on Robot Framework](#) in Python for verifying hardware components (ethernet, SFP, Wi-Fi, NAND, I²C, SPI, mPCIe) of a custom OpenWrt network device with +2,000 units post-manufacturing.
- Expert in Linux network hardware platforms based on Marvell (Presteria, AlleyCat3, PonCat3, Aldrin2), Qualcomm (ar71xx-ath79, ipq), and MediaTek (mt7981).

- Set up an internal cross-compilation environment for C, C++, Golang, and Rust-based projects targeting x86, aarch64, arm, mips and riscv64 platforms.
- Developed a tailored statically-linked application in Go language for embedded network switch operations.
- Deployed and managed internal and external GitLab and GitHub CI/CD with ESXi and Proxmox.
- Served as a participant of the DENT Foundation TSCs as well as Spack weekly telcons.
- Public speaker at [FOSDEM](#), [All Systems Go!](#), and [DORS/CLUC](#) and frequent participant of [embedded world](#), [prpl Summit](#), [Network X](#), [NetDev](#) conferences.

Project Manager

JUNE 2020 – AUGUST 2021

- Responsible for defining long-term project roadmap in collaboration with multiple stakeholders and managed an internal development team on the open-source [Sysrepo / NETCONF project](#).
- Co-ordinated a rewrite of Sysrepo plugins for OpenWrt UCI configuration mapping to use the open-source [uci2 library](#) with abstract syntax tree (AST) representation.
- Developed a proof-of-concept [TR-181 Data Model](#) to OpenWrt UCI conversion plugin.

Embedded Firmware and Software Engineer

OCTOBER 2019 – JUNE 2020

- Helped develop a PoC internet service provider software-defined networking (SDN) stack with Open vSwitch / VXLAN, hostapd 802.1x + FreeRADIUS.
- Integrated [RFC 8159 \(Keyed IPv6 Tunnel\)](#) and [RFC 7596 \(Lightweight 4over6\)](#) implementations written in eBPF / XDP as Gentoo packages with cross-compilation support.
- Firmware engineering and board-bring up (BSP) for embedded Linux network devices, primarily APs / CPEs.
- Worked on a plugin for network function virtualization (NFV) in C for a proprietary device management solution.
- Designed and developed a proof-of-concept Docker-based firmware build system based on the Gentoo Linux distribution.
- Contributed to open-source projects: the Linux kernel, U-Boot, Gentoo, OpenWrt, etc.

Student Intern, Linux System Administrator

JUNE 2019 – OCTOBER 2019

- Deployed and managed FreeSWITCH open-source telephony stack for telco on-prem IP PBX.
- Developed a build system for creating Gentoo-based Linux containers (LXC).

EDUCATION

FER Faculty of Electrical Engineering and Computing, University of Zagreb FEBRUARY 2021

Master of Science (MSc) in Electrical Engineering and Information Technology

Master's thesis: "*Solving a linear program on an embedded computer architecture*", implemented Mehrotra's predictor-corrector method in Rust and C++ (with Armadillo linear algebra library)

Faculty of Electrical Engineering and Computing, University of Zagreb JULY 2018

Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb

Bachelor of Science (BSc) in Energy Technologies

Bachelor's thesis: "*Rotational speed control of a variable-speed variable-pitch wind turbine*"

PROJECTS

github.com/sartura/replica

SARTURA, OPEN SOURCE

"*Replica.one is an easy to use build system based on Gentoo designed to deliver both secure and flexible firmware images.*"

Chief architect and main developer, team leader. Responsible for project planning, implementation, documentation, and handling client feature requests.

PUBLICATIONS

- Review of kernel and user-space Neural Processing Unit (NPU) chips support on Linux** JANUARY 2026
Presentation at FOSDEM 2026, Brussels, Belgium in “AI Plumbers” devroom about AI acceleration ASICs whether Graphics Processing Units (GPUs), Tensor PUs, or Neural PUs. Focus on reviewing Linux software stacks for AI/ML training and inference on various platforms.
- Production-line automation of hardware testing using Robot Framework** MAY 2024
Presented at DORS/CLUC 2024, Zagreb, Croatia in collaboration with Soldered.
- Replica.one: A Software-defined Operating System** SEPTEMBER 2023
Presentation at All Systems Go! 2023, Berlin, Germany which details our work on Spack, a package manager for HPC developed at Lawrence Livermore National Laboratory (LLNL), as a possible future Replica.one core engine.
- Open Source Switching: Upstreaming ONIE NVMEM and switch BSP drivers** FEBRUARY 2023
Presentation at FOSDEM 2023, Brussels, Belgium in “Embedded, Mobile and Automotive” devroom regarding kernel upstreaming work being done on behalf of the DENT Project for whitebox switches.
- The Replica.one: Versatile Image-based Software Stack** OCTOBER 2022
Presented at prpl Summit 2022, Amsterdam, Netherlands.
- How we developed a custom build platform for the Enterprise** MAY 2022
Presented at DORS/CLUC 2022, Zagreb, Croatia.
- eBPF Firmware Integration with Replica.one** OCTOBER 2021
Published as a blog post on Sartura website.

SKILLS & OTHER

- Skills:** Embedded Linux firmware (Gentoo, OpenWrt, Buildroot, Yocto, Android, U-Boot), Software development (C, C++, Go, Rust, Flutter), Distribution packaging (Debian, Arch, Nix) and scripting (Git, Python, Lua, shell, make), Systems Administration (systemd, Docker) and DevOps (GitLab and GitHub CI/CD), Scientific computing (MATLAB, scikit-learn, AutoCAD), Network engineering (switchdev, 802.1x, MLAG, RSTP, VLAN, BGP, NDcPP), Complex software and network debugging (GDB, Valgrind, Wireshark)
- Interests:** Open source software, firmware engineering, control systems (optimal control, intelligent control), robotics (multi-agent systems)