

Oleksandr Redchuk

Software Engineer

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🌐 ReAIUA



Summary

Embedded software/hardware engineer with more than 25 years of professional experience. Main industries are medical and automotive equipment, public safety (fire detection and alarm). The main area of expertise is Linux kernel, RTOS, firmwares on ARM-based devices as well as 8-bit microcontrollers. For the last 4 years has been mostly working on downstreamed kernels (driver development and customization) and RTOS-based firmware on Cortex-A (32-bit) + Cortex-M heterogeneous SoC. Has prior background in design of embedded devices including SW and HW: electronics, algorithms, Bare-Metal and RTOS-based firmware development.

Experience

- 2021– **Software Engineer, Auto-talks**
Present Projects: Automotive V2X devices.
Role: Driver development in Linux kernel, firmware development
- Custom kernel driver development
 - Adding new features to standard kernel drivers
 - Migrating to new kernel version
 - Bug fixing (drivers, device tree, firmware)
 - Hardware debugging
- 2020–2021 **Software Engineer, GlobalLogic, Kyiv**
Project: Medical IoT device (ESP32, FreeRTOS)
Role: Leading a small team, SW/HW development.
- Development and optimization of algorithms
 - Developing data acquisition and processing software
 - Hardware debugging, schematic fixing and optimization
- 2018–2021 **Software Engineer, GlobalLogic, Kyiv**
Project: Automotive device.
Role: Driver development in Linux kernel, firmware development
- Custom WiFi driver implementing and speed optimization
 - Hardware encryption accelerator driver speed optimization
 - Adding new features to standard kernel drivers
 - Firmware development (Cortex-M)
 - Bug fixing (drivers, device tree)
- 2006–2018 **Chief SW/HW engineer, Ista-Sital, Kyiv**
Projects: Fire detection and I/O devices.
Role: Development of EN54-compliant addressable fire detection and alarm system components:
- Creating of own loop-powered addressable devices protocol
 - Smoke and heat detectors (AVR), manual call point and IO modules (STM32L0), loop controller for testing/technology purposes (STM32F1).
 - Hardware design (schematics, control over the design of printed circuit boards)
 - Embedded software development (AVR — assembler, STM32L0/F1 — C)
 - Participation in the creation of a smoke/heat test tunnel
 - Certification support

- 2015–2017 **SW/HW engineer (part time)**, *National Aviation University*, Kyiv
 Project: Dedicated dead reckoning module — GPS emulator for Ardupilot mega.
 Role: SW/HW development
 ○ FORTRAN to C++ code porting
 ○ test-vector-based PC verification.
 ○ Implementation in microcontroller (STM32F303)
- 1999–2006 **Head of Electronic Systems Department**, *Teleoptic*, Kyiv
 Project: Line of multi-sensor medical digital X-ray detectors (international patent WO2006049589A1 and Ukraine patent)
 Role: SW/HW development
 ○ CCD cameras and data acquisition system (AFE and digital part) hardware design.
 ○ Non-standard CCD timing design.
 ○ PC to hardware control protocol design
 ○ Embedded software (microcontrollers and programmable logic) development
 ○ Windows 98/NT/XP control/data communication DLL
- 1985–1999 *Many interesting but outdated projects*

Education

- 1980–1985 **Master's degree**, *Kyiv National University*, Kyiv
Speciality: Radio physics and electronics

Computer skills

Languages	C, Bash	Projects	Linux kernel, RTOS, Bare Metal
CPUs	ARM32, x86	MCUs	STM32, LPC17xx, AVR, MCS51
Tools	GCC, GDB, Make, Git, Vim	HW Tools	scope, logical analyzer, JTAG

Languages

Ukrainian	Fluent	<i>My native language</i>
English	Intermediate	<i>Speaking, reading and writing</i>

Other Activities

- 2017–Today Translation of techical books from English to Ukrainian
 ○ *CLRS 3rd ed.* (translator, ~1/4 of the book's content)
 ○ *"Python crash course"* (co-editor)
 ○ A new project is currently in progress
- 2017–Today Member on StackOverflow (>1k reputation) [1]
- 2020–2021 Instructor of Linux kernel courses [2]
- 1998–2018 Creator of AVReAl – AVR ISP programming software for MS-DOS, Windows, Linux and FreeBSD [3]

References

- [1] <https://stackoverflow.com/users/8848476/real>
- [2] <https://github.com/ReAlUA/kernel-lectures>
- [3] <https://real.kyiv.ua/avreal/>