Oleksandr Redchuk

Software Engineer

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━━━━ Summary

Embedded software/hardware engineer with more than 30 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, bare-metal firmware on ARM-based devices as well as 8-bit microcontrollers. For the last 5 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: analog and digital electronics, algorithms, Bare-Metal and RTOS-based firmware development.

━━━━ Experience

2021– Present **Software Engineer**, *Autotalks*

Projects: Automotive V2X devices.
Role: Driver development in Linux kernel, RTOS-based firmware and bootloader development
Techologies: Cortex-A, Cortex-M; C, Assembler;
- Custom kernel driver development
- Adding new features to existing kernel drivers
- Migrating to the new kernel version
- Firmware development
- Bug fixing (drivers, device tree, frimware)
- Hardware debugging

2020–2021 **Software Engineer**, *GlobalLogic*, Kyiv

Project: Medical IoT device
Role: Leading a small team, SW/HW development
Technologies: ESP32, FreeRTOS
- Development and optimization of algorithms
- Development of data acqusition 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, firmware)

2006–2018 **Head of SW/HW development**, *Ista-Sital*, Kyiv

Projects: EN54-compliant addressable fire detection and alarm system components.
Role: Development of software and hardware (schematics, supervising of PCB development)
Technologies: STM32L0, STM32F1, AVR; C, Assembler
- System-level design
- Creation of own loop-powered addressable devices protocol
- Smoke and heat detectors, manual call point and IO modules
- Loop controller for testing purposes
- 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.
Patents: UA77289C2 "X-ray receiver" (Ukraine), US7496177B2 "X-ray converter" (USA), DE602005013577D1 (Germany). Utility model patnet UA1282U "Device for printing multi-format images on photosensitive film" (Ukraine).
Role: SW/HW development
Technologies: Altera MAX3K, Cyclone, AVR, LPC17xx; C, Assembler, AHDL, Verilog
- 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

1995-2005 **SW/HW engineer (part time)**, *Ista-Sital*, Kyiv
Main projects:
- Monitoring and video surveillance system.
- Electronic taximeter Pulsar-U with radio-modem interface to the local payment system.
- Interfaces, data loggers for security systems.
Patent: UA37291 "Monitoring and video surveillance system" (Ukraine).
Role: SW/HW development
Technologies: Altera FLEX8K, MCS-51, PIC16, AVR; C, Assembler, AHDL
- Schematics development
- Supervising PCB development
- Embedded software and programmable logic firmware development
- Control library development

1990-2005 **Research fellow**, *Kyiv Polytechnic Institute, College of Instrument Design and Engineering*, Kyiv
Main projects:
- Linear CCD-based portable spectrometers
- Matrix CCD-based spectrometer for aerial photography
- LWIR video camera
- ISA video capture board
Role: SW/HW development
Technologies: Altera small PLD, EP10K, AVR; C, Assembler, PLDasm, AHDL
- Schematics and PCB development
- Embedded software and Control libraries development

1985–1990 *Some interesting but too 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	ARM64, ARM32, x86	MCUs	STM32, LPC17xx, AVR, MCS51
Tools	GCC, GDB, Make, Git, Vim	HW Tools	scope, logical analyzer, JTAG

Languages

Ukrainian	Fluent	*My native language*
English	Intermediate	*Speaking, reading and writing*

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]
2006–Today	Active Wikipedia editor – more than 19,000 edits (Ukrainian language edition mostly)
2020–2021	Teacher on Linux kernel courses [2]
1998–2018	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/