Oleksandr Redchuk

Software Engineer

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ReAlUA

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– Present **Software Engineer**, *Autotalks*
Projects: Automotive V2X devices.
Role: Driver development in Linux kernel, firmware development
- Custom kernel driver development
- Adding new features to existing kernel drivers
- Migrating to new kernel version
- 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 hardware and embedded software.
Technologies: STM32L0, STM32F1, AVR
- 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 (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	*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]

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/`