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Brief description

My major activity – C/C++ development on Linux-based platforms now with more and more Rust involvement.

I really enjoy the OpenSource software and interaction with community and do my best to contribute to OpenSource projects which I'm interested in or have to deal with at day-time job.

Commercial Projects

C/C++ for Linux/QNX

Arene OS <https://woven.toyota/en/arene/>

Arene OS toolchain support and enhancement.

We're working on different toolchains for the Arene OS development and their promotion among developers: different compilers, linkers, code analysis tools and providing the best and securest toolchain to develop the vehicle of the future.

C/C++ / Linux

Tizen <https://tizen.org>

Tizen toolchain support and enhancement.

Our team has been working on toolchain support and enhancement accordingly to requests of Samsung developers all over the world and own vision of perfect toolchain. We were the guys who created an ARM64 Tizen 3.0 in the beginning of 2014 and stabilized the OS even before first 64bit Android release, and started RISC-V version in 2023.

We prepared a fully-sanitized image of Tizen OS to check all the applications at once for testing purposes, and applied binary watermarking technology system-wide to get maximum from available tooling.

Digging inside GCC and Binutils to find why stack trace tells lies to developers, debugging on-device soft using gdb through port forwarded using netcat over Wi-Fi because kernel is not finished and there is no other way to connect, finding a way to implement needed feature the right way instead of workaround in the limited time—that's about me.

After promotion to project lead the task set widened with looking for appropriate customer for such experience and directing team members' fun into scope needed by commercial divisions. Ten years of successful projects say I'm useful in this field as well.

Our team was invoked into code analysis movement and I joined dynamic analysis forces to improve and promote sanitizers among Samsung. Now, as far as I know, we're the first team who performed full-system sanitization (not sure if someone tried that anyway).

Experience

2024 - still **Staff Engineer**, *Woven by Toyota*, Tokyo, Japan

here C/C++ toolchains improvement, Linux/QNX/Bare metal toolchains development. Work with MISRA and AUTOSAR, integration with code analysis tools, providing build system for the Arene OS.

2021 - 2024 **Staff Engineer**, *Samsung Research Russia*, Moscow, Russia

Rust evangelism among SRR developers, research projects on new ARM and RISC-V platforms

- 2017 - 2021 **Staff Engineer/Team Lead**, *Samsung Research Russia*, Moscow, Russia
Toolchain improvement, dynamic software analysis research, Improving Tizen code base from toolchain point of view: dynamic analysis (sanitizers), new optimizations. Applying dynamic binary analysis technologies to embedded systems ([Tizen RT](#))
- 2014 - 2017 **Leading Engineer/Team Lead**, *Samsung Research Russia*, Moscow, Russia
Toolchain support and enhancement. Improving Tizen code base from toolchain point of view: dynamic analysis (sanitizers), new optimizations
- 2013 - 2014 **Leading Engineer/Team Lead**, *Samsung Research Russia*, Moscow, Russia
Toolchain support (GCC compatibility issues maintaining and bugfixes)
Solving architecture related issues (porting from arm to arm64)
- Feb 2012 - **Software Engineer**, *Samsung Research Russia*, Moscow, Russia
2013 Native mobile software optimization (C/C++)
Profiling and optimization tool development (Linux kernel module profiling part, python GUI and statistical and reporting module)
Software development.
- Sep 2006 - **Expert Engineer**, *InterRadioService LLC.*, Moscow, Russia
Feb 2012 Hardware engineering
Software development (mostly for hardware support).
Maintaining compatibility features for ancient (40 yrs and more) devices.
Fieldwork with hardware and support during full-scale tests.

Development skills

Programming Languages

- Expert C, C++
- Intermediate Rust, Python, ARM Assembly Language
- Basic Perl, x86 Assembly Language

Frameworks and tools

- Development Build system related tools: Makefile, m4, cmake, shell scripting, the GNU tool set built around traditional *nix software development.
- Debug Low-level system debug: gdb, kdb, U-Boot debug
- GUI Qt (C++ and Python versions), basic web-interface
- OS Linux-based (from LFS and Gentoo to full rpm-based Tizen)
- VCS git, svn

Server administration skills

- OBS Deep knowledge of service internals, have experience in setup, configuration and bootstrapping from scratch for rpm-based Tizen OS
- General Setting up and maintaining all servers needed for work – CI, source hosting, web-interfaces just need enough time.

Publications

Software Analysis

- 2020 **2020 Ivannikov ISPRAS Open Conference**, <https://ieeexplore.ieee.org/document/9394129>
Report *Applying compiler-based binary watermarking technology to ensure binary compatibility in GNU/Linux distribution*.
Published in Proceedings of 2020 Ivannikov ISPRAS Open Conference (ISPRAS).
DOI: [10.1109/ISPRAS51486.2020.00009](https://doi.org/10.1109/ISPRAS51486.2020.00009).
- 2019 **GNU Tools Cauldron**, <https://gcc.gnu.org/wiki/cauldron2019>
Report *Annotating std::string with AddressSanitizer*

- 2017 **GNU Tools Cauldron**, <https://gcc.gnu.org/wiki/cauldron2017>
Report *Applying GNU GCC Address Sanitizer to whole Linux distribution*
- 2017 **2017 Ivannikov ISPRAS Open Conference**, <https://ieeexplore.ieee.org/document/8273297>
Report *Applying GCC-Based Address Sanitizer Dynamic Analysis Technology to Tizen OS*.
Published in Proceedings of 2017 Ivannikov ISPRAS Open Conference (ISPRAS).
DOI: [10.1109/ISPRAS.2017.00015](https://doi.org/10.1109/ISPRAS.2017.00015).

Education

- 2015 **People Management**, <http://www.luxoft-training.com/>, Moscow, Russia
Project manager tasks related to grouping people into team
- 2014 **Project Management**, <http://www.luxoft-training.com/>, Moscow, Russia
Project manager quickstart
- 2005 - 2011 **Electronics Engineering**, *Bauman's Moscow State Technical University*
M.Sc. in Electronics device and systems engineering

Public activity

- LinkedIn <https://linkedin.com/in/rayslava>
- GitHub <https://github.com/rayslava>