Joseph Artsimovich

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Profile

I started programming in late 90s, back in high school. My first language was C. A few years later I switched to C++ and I've been using it ever since. Even though my career involved PHP web development and Java back end development, I never took a break from C++, as I was using it in my Open Source projects at the time.

For personal reasons I never finished my higher education, though my undergraduate-level maths is decent enough for a software engineer.

See also my profiles on StackOverflow and HackerRank.

Achievements

First contribution to an open source project in year 2000.

Started two open source projects:

- BFilter: started in 2002, ~110K lines of code, current status: abandoned.
  Technologies used: C++, Boost, ACE, Networking, Multi-threading, Gtk, WxWidgets.
- Scan Tailor: started in 2007, ~135K lines of code, current status: maintained by others.
  Technologies used: C++, Boost, Qt, Image Processing, Multi-threading, OpenCL, Eigen.

Having learnt x86 assembly in late 90s, it became useful much later, allowing me to pick up reverse engineering skills in no time. Here are some of the results: one, two, three, four. However, the last time I did reverse engineering was around 2012.
Technologies used: IDA Pro, OllyDbg

Finished in top 25% in three Kaggle machine learning competitions. (31^{st} out of 200, 76^{th} out of 718 and 116^{th} out of 504).
Technologies used: Matlab (GNU Octave actually), Python + NumPy, Theano.

Skills

Expert: C++, Networking, OOD, Qt, Boost, CMake.
Advanced: SQL, Multi-threading, Image processing, Linux, Docker, GithubActions.
Some experience in the past: Java, Python, Machine Learning, OpenGL, OpenCL, CUDA, QuickTime, MXF, TDD.

Work History

Senior Engineer II – Fatmap (later Strava)

Lithuania (remote) - Permanent – Developing a Map Rendering Engine for Mobile Apps Jul 22 – Present

Fatmap was a mobile app for outdoor enthusiasts, climbers, hikers, etc. Later is was acquired by Strava and killed, though the map rendering engine was (still being) integrated into the Strava app. The Strava app is aimed at professional and amateur athletes. I was on the team developing the map rendering engine. The engine does hardware accelerated rendering of both vector and satellite maps, both in 2D and in 3D. It also downloads tiled data from backend servers and maintains a disk cache of that data. My major contributions are listed below:

- Rewrote the disk caching subsystem. The rewrite delivered the ability to support parametrized tile sources think personal heatmaps) and realtime cache size management.
- Rewrote the text rendering subsystem. The rewrite added support for on-demand loaded glyphs (think CJK support), fallback fonts, and made ingesting new fonts easy.
- Ported the rendering engine to Linux and created the Headless Renderer, which is used on the backend to generate shareable activity visualization videos.

Technologies used: C++, Ogre, OpenGL (ES), ANGLE, Boost, Djinni, Freetype, Gmock, Protobuf, Docker, GithubActions.

Lead Developer – Neokon Baltija

Visaginas, Lithuania - Permanent – Developing Train Simulators Feb 18 – Jun 21

Neokon-Baltija develops train simulator software. Having joined the company early on, I became the lead developer and led the development of two sub-projects: the train driving simulator and the instructor station. I designed the architecture and wrote large portions of the source code. The only area I didn't touch was the physical computations layer.

Technologies used: C++, Unigine, Qt, Boost, Gmock, ZeroMQ, Protobuf.

Senior Software Engineer – V-Nova

London, UK - Permanent – Developing Solutions for Video Broadcasting Industry Jul 15 – Apr 16

V-Nova develops a video codec for the broadcasting industry, called Perseus. I was on the team developing the Perseus Link (P-Link) appliance, which is an encoder-decoder pair for real-time delivery of video streams from a live event to a TV studio. My major contributions are listed below:

- Added support for Matrox video I/O hardware in addition to existing support for Deltacast hardware.
- Re-implemented the Genlock-over-IP feature using a more sophisticated mathematical approach.
- Worked on a transition from a proprietary bitstream format to MPEG2-TS.
- Added support for SMPTE 302M AES3 audio bitstream as an alternative to V-Nova's proprietary one.

Technologies used: C++, Boost, Gmock, Buildroot, MainConcept.

Senior Software Engineer – YouView TV Ltd

London, UK - Permanent – Embedded Development for Set Top Boxes Jun 13 – Jun 15

YouView develops firmware for Set Top Boxes offered by BT and TalkTalk. Being part of the C++ team of 15-18 people my work involved maintaining existing code (in particular the security infrastructure) and developing new features. The most notable areas I was working on are listed below:

- Developed an HTTP-to-DBus bridge, allowing to expose a subset of internal Set Top Box APIs to mobile clients. As part of this work, I contributed fixes and improvements to json-glib and libsoup Open Source projects.

- Created a low-level component for the Audio Feedback feature, targeted at users with poor vision. This involved working with low level Broadcom Nexus audio APIs and communicating with OEMs.
- Added support for PKCS11-compatible smart cards to YouView application signing utility.
- Improved the build time from 1.5 hours to 30 minutes by integrating ccache into our build scripts.
- Implemented a tool to visualise and compare the memory consumption of different components in different versions of Set Top Box firmware.
- Led the effort to port and integrate Netflix into YouView platform.

Technologies used: C++, Boost, Gmock, Multi-threading, some pure C, some Java, some Python.

Senior C++ Applications Developer – MirriAd Ltd

London, UK - Permanent – Video Post-production Feb 09 – Jun 13

Most of my time in the company (except about 6 months initially) I've been working on the core product of the company, ZoneSense, which is basically a video analysis / compositing package that uses a GPU cluster for heavy duty processing. ZoneSense is written in C++ with Qt and uses CUDA for GPU computations.

My main responsibility was the development and maintenance of video I/O code for broadcast video formats. This involved working with and contributing to the following open source projects: FFMpeg, libquicktime, MXFlib.

My other notable contributions are:

- A manual warping tool.
- An automatic frame type detector. To each frame it assigns one of 23 labels, such as *Progressive, Interlaced UFF, 3:2 Pulldown BC LFF, ...*). This task involved Machine Learning and Probabilistic Graphical Models.
- Introduced the Undo framework.

Technologies used: C++, Qt, Boost, CUDA, Machine Learning, Probabilistic Graphical Models.

C++ / Java Developer - UAB "DKD"

Visaginas, Lithuania - Permanent - Information Technology Nov 06 – Sep 08

I was involved in design, development and maintenance of back-end systems for web projects. These included:

- A VoIP communication service for a dating site. Its back-end comprised the Asterisk telephony server, a custom billing service, and a custom Flash-to-VoIP gateway based on the Red5 application server. The Flash-to-VoIP gateway was written in Java, while most of the rest was in C++.
- An automated system for mirroring static web content to Amazon S3 and redirecting traffic there. It's a multithreaded C++ daemon that communicates with a database, a memcached server, and Amazon S3 servers.
- I took over the development and then maintenance of a web statistics system. Its back-end comprises a custom high performance web server, a process for real time analysis of web hits and multiple tools for postponed analysis. Most of the back end was written in C++.

Technologies used: C++, Boost, ACE, SQL, Networking, Java, Red5, Asterisk.

Web Developer - reisen.ch AG

Contract/Temp 2001 – 2006

I was developing and maintaining various web projects. The platform was PHP + PostgreSQL + Java on the back-end.

Technologies used: PHP, SQL, Java, JavaScript, XPath.

Web Developer - Jobsuchmaschine AG

Contract/Temp 2000 – 2006

I was developing and maintaining various web projects. The platform was PHP + PostgreSQL + some Perl on the back-end.

Technologies used: PHP, JavaScript, SQL, Perl.

Education

As mentioned above, I didn't finish my higher education. However, my Maths is in good shape, as can be seen by me taking and successfully completing the following courses:

- ELEC301x Discrete Time Signals and Systems – certificate
- CS188.1x: Artificial Intelligence – certificate + letter of distinction
- Probabilistic Graphical Models – certificate (with distinction) available on request (*).
- Neural Networks for Machine Learning – certificate (with distinction) available on request (*).
- Introduction to Data Science – certificate (with distinction) available on request (*).
- Linear and Discrete Optimization – certificate available on request (*).
- Image and video processing: From Mars to Hollywood with a stop at the hospital – certificate (with distinction) available on request (*).
- Game Theory – certificate (with distinction) available on request (*).
- Cryptography I – certificate (with distinction) available on request (*).

* Coursera (unlike EDX) doesn't make your certificates available publically, which is the reason I can't simply provide a link.