Ekaterina Antakova

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Senior Software Engineer

Software engineer with more than 10 years of experience building cross-platform developer tools for CPU and GPU code analysis, focusing on user interfaces, complex data representation and performance analysis methodology, especially in parallelism and vectorization. Proficiency in planning, high-level features integration, customer communication, external and internal feature design, quality code production and healthy development processes.

Skills

- Advanced C++ (Boost, wxWidgets, RapidJSON)
- Cross-platform GUI development
- Intermediate Python (pytest, pandas, scikit-learn, Jupyter, ipywidgets)
- Git, SVN, Jira, XML, XSLT
- Experience with HTML, CSS, JavaScript, Vue.js
- Performance analysis and optimization
- Correctness analysis
- Stakeholder, requirements and release management, agile methodologies

Experience

Senior software engineer – **Intel**, 2011-2022

- **Drove** development of first **fully automatic Roofline performance model generation** in Intel® Advisor. Created design proposals with product architect, internal and external experts, participated in cross-industry workgroup. Defined sub-features like per-thread and per-socket roofs, specific of integer operations analysis, memory levels visualization and optimization guidance. Collaborated with University of Porto in a joint research on Roofline-based guidance methodology and contributed to Roofline tutorials ISC'18, SC'18, and other HPC conferences.
- Led integration of compiler static optimization reports and dynamic code analysis in Intel® Advisor which provides a **focused list of most time-consuming loops with their vectorization characteristics**. Ensured timely cross-team collaboration with compiler representatives, proposed joint designs, managed request list and performed regular sync-ups. Added 20 recommendations of loop optimization for SIMD with suggestions of OpenMP 4.0 usage together with info-developers. The feature was highly valued by US and European HPC customers, CAE and simulation application vendors.
- **Enabled new usage model** of an analyzer product increasing its adoption and flexibility **by porting its GUI to Mac OS**. Prototyped the initial version in a couple of weeks, collected requirements and coordinated joint efforts with 3 other development teams. Good pre-release quality of Mac OS version allowed demonstrating it on high-profile customer events like HPC DevCon and SC'17 conference, which delighted customers as proven by several positive quotes.
- **Acted as GUI team lead** in Intel® Inspector **for 2 years** with positive impact on quality and timelines maintaining flat or declining bug backlog during 6 product releases. Led quality initiative which reduced GUI defects count from 50+ to 20 while maintaining the expected pace in developing new features. Created multiple SW design and feature proposals to architects for multiple features: new diagnostic suppression mechanism, updated analysis depth controls and on-demand memory leak detection.
- Constantly improved development processes: pioneered adoption of Scrum in the team of 10 engineers serving as Scrum master for 2 years, created user stories templates for easier iteration planning in project of 30 developers, created and maintained multiple internal documents on core components software design, mentored experienced and new software engineers.

Software engineer - **Intel**, 2007-2011

- Refactored main GUI components stack in an analyzer product improving testability, modularity, and maintenance cost. This resulted in adding 74 new unit tests and increased test code coverage by 20% in functions and 13% in basic blocks. This enabled releasing several product flavors by making scoped updates in localized components, toggling the features and UI-style tweaks. This investment in quality paid off next year, allowing the same development team of 4 GUI engineers to quickly adapt to new requirements and release a new product flavor in a couple of months.
- Moved analyzers products to cross-platform GUI making 7 modules cross-platform by solving Linux-specific issues. During a year, our team of 3 engineers made all Intel® analyzers cross-platform with a unified look-and-feel on Windows and Linux, driving it to release quality.
- Implemented custom GUI controls in C++ using the wxWidgets library: tables with in-place editing for managing files and folders, animated panels, stylized buttons with branded backgrounds.

Software engineering intern - **Intel**, 2006-2007

- Enabled unit testing of GUI controls in analyzers products by creating shared window search and manipulation test layer over wxWidgets library.
- Developed infrastructure for regular component unit testing with text, XML and XSLT reporting for a project of ~80 developers helping to monitor quality and fix issues quickly. It has been essential in analyzers development process for 15 years and it is still actively used.
- Extended file search capabilities in analyzers tools using Boost library along with adding GUI dialogs for file and folder management to allow users connecting analysis tools to different project structures.

Education

Specialist Diploma in Mathematics and Informatics, **with distinction** - Lobachevski Nizhny Novgorod State University, Nizhny Novgorod, Russia, 2002-2007.

Publications, Presentations, Volunteering

- Author of articles on performance analysis in HPC:
  - Cedric Andreolli, Jim Cownie, Ekaterina Antakova. [Understanding and Improving the Performance of Bandwidth Bound Code](). Scientific Computing World - HPC 2018-2019,
  - Ekaterina Antakova. [How to Design for Scalable Performance - from Multicore to Many-Core](). Parallel Universe Magazine, Issue 19, 2014.
- Technical program coordinator at [Women in Big Data Community in Russia](), 2017-2019:
  - Arranged lectures, talks and master-classes for members of the community,
  - Developed Python for data science workshops curriculum for a series of meetups,
  - Delivered [3 Python workshops]() on data cleaning and analysis.
- Public speaker and lecturer on software development and performance optimization:
  - [SIMD and Vectorization](). Lecture at Intel-UNN Performance Optimization Winter Camp on Computer Vision Algorithms, 2022,
  - [Talk on SW engineer career development](), 2021,
  - [Overview of Roofline Performance Model]() for Nizhny Novgorod Data Science group, 2021,
  - [Check, Model and Check Again (in Russian).]() Presentation on Intel® analysis tools at SECR-2013 conference.