Egor Orachev
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I am a graduate software engineer with a solid and sufficient research background, currently studying a master's degree program. My professional preferences are high-performance GPU computing and real-time high-quality 3d graphics. My research and university project activity allows me to gain new experience and knowledge in these areas. I am interested in developing a career, which combines research, engineering tasks, product development and team management, in order to become a qualified specialist and a good technical leader.

Research Interests

Graph Databases, Path Queries, Parallel Computing, High-Performance Computing, GPU Programming, Sparse Linear Algebra

Education

Saint Petersburg State University (2021 - present)

M.Sc. in Software Engineering
Estimated graduation date: 2023. Thesis title: Generalized sparse linear algebra framework for multi-GPU computations. Advisor: Semyon Grigorev.

Saint Petersburg State University (2017 - 2021)

B.Sc. in Software Engineering
Thesis title: Context-free path querying by Kronecker product for graph databases on GPGPU. Advisor: Semyon Grigorev.

Professional experience

Research intern, JetBrains Research (2020 - present)

- Development of the research software
- Experimental study of developed algorithms and methods
- Research article writing
- Assistance in conducting seminars
- Supervising undergraduate students

Software engineer intern, JetBrains (summer 2021)

- Implementation of new modules and features
- Research of existing projects and analogues
- Library interface design

Projects

- **SPLA** (C, C++, OpenCL, Python). Sparse linear algebra framework for multi-GPU computations.
- **JWM** (C++, Java, WinAPI). Modern cross-platform Java window management and OS integration library.
- **SPbLA** (C, C++, OpenCL, CUDA, Python). Sparse boolean linear algebra library for CUDA, OpenCL and CPU computations.
- **cuBool** (C, C++,CUDA, Python). Sparse boolean linear algebra library for CUDA.
- **Ignimbrite** (C++, Vulkan). High-performance 3d graphics library for Vulkan.
- **Tensor-CFPQ** (C++, CUDA). Tensor product based CFPQ algorithm implementation for CUDA.

Publications

- Egor Orachev, Maria Karpenko, Artem Khoroshev, Semyon Grigorev. 2021. **"SPbLA: The Library of GPGPU-Powered Sparse Boolean Linear Algebra Operations"**. JOSS: The Journal of open-source software.
- Egor Orachev, Maria Karpenko, Artem Khoroshev, Semyon Grigorev. 2021. **"SPbLA: The Library of GPGPU-Powered Sparse Boolean Linear Algebra Operations"**. GrAPL: Workshop on Graphs, Architectures, Programming, and Learning.
- Ekaterina Shemetova, Rustam Azimov, Egor Orachev, Ilya Epelbaum, Semyon Grigorev. 2020. **"One Algorithm to Evaluate Them All: Unified Linear Algebra Based Approach to Evaluate Both Regular and Context-Free Path Queries"**. ArXiv.
- Egor Orachev, Ilya Epelbaum, Rustam Azimov, Semyon Grigorev, 2020. **"Context-Free Path Querying by Kronecker Product"**. ADBIS: European Conference on Advances in Databases and Information Systems.

Research Skills

- Preparation of scientific texts and reports
- Development and analysis of new methods and algorithms
- Prototyping and testing GPU algorithms
- Benchmarking and evaluation of algorithms
- Applying engineering knowledge to scientific developments

Skills

- **Programming Languages:** C, C++ (preferred), C#, Java, Python
- **GPU Related technologies:** CUDA, OpenCL, Vulkan, OpenGL, Direct3D
- **Languages:** Russian (native), English (upper intermediate), German (beginner)