Poliarnyi Nikolai
Полярный Николай

Work Experience

- Agisoft Metashape

Since April 2016

Mathematician-Programmer (Team Lead)

R&D: tune performance, pioneer innovations, identify&eliminate major user pain points.

- Invented a scalable, multi-scale surface reconstruction method (out-of-core/cluster-friendly), published a paper at ICCV 2021.
- Developed GPU-accelerated algorithms (using custom OpenCL/CUDA/Vulkan wrappers), including: depth maps reconstruction and out-of-core texture generation.
- Enhanced cloud performance, achieving 2x faster processing.
- Photographed (15K images) and digitized the UNESCO site Kizhi Pogost.
- Set up in-office local LLM server.

Computer Vision, Computational Geometry, OpenCL/CUDA/Vulkan, LiDAR, AI/ML

- Transas

October 2014 - March 2016

Mathematician-Programmer

Developed a server that produces 3D landscape reconstruction and true orthophoto stitching from UAVs' data.

OpenCV, OpenCL, Python, Cython, Ceres-solver

- Yandex.Money

February 2014 – October 2014: Software Developer (Java backend)

- DevExperts

April 2013 – September 2013: Software Developer (Java backend)

Skills

- **Computer Vision**: Structure from Motion, Multiple View Geometry, AI/ML, objects detection/classification/segmentation, magic. Better than state of the art depth maps estimation, surface reconstruction, texturing and other algorithms.
- **Computational geometry, CGAL**: computations with absolute accuracy, algorithms and structures like Delaunay triangulation.
- **Vulkan, OpenCL, CUDA, OpenGL, WebGL**: GPGPU computations, shaders, ray tracing, algorithms profiling/acceleration/adaptation for the GPU. Able to work around bugs in video drivers and compilers.
- **C++, Python, Java**

Activities

- **Consultant**: provides consultation/project-development services to companies and startups on topics related to Computer Vision and GPU-acceleration.
- **Public lectures**: GPGPU in CS Space, Science Day in school, Algorithms behind Unreal Engine 5 Nanite tech.
- **Photogrammetry course**: developed Photogrammetry course in Computer Science Club. Teaching it in SPbU and ITMO. Video recordings. Tasks on github.
- **GPGPU course**: developed GPGPU OpenCL course in Computer Science Center. Video recordings. Tasks on github.
- **Open-source**: Vulkan API library. Out-of-core merge sort with GPU acceleration. 96-bit 3D Morton code. OpenCL implementation of EDISON mean shift. Implemented Python bindings for OpenCL algorithms in OpenCV. Contributions to OpenCV, PyOpenCL, jupyter qtconsole and others. GPU monitoring in i3pystatus.
- **Hackathons**: six awards on hackatons. Two first places on X-Mas Hack (mission planner for drone swarm). Third place on HackCV (traffic signs recognition), Science Hackday #2 (Startup nomination), Hackday#36 (Autodesk 3D-web nomination), HackEdu by JetBrains (third place). Participation in Junction 2016, 2017.
- **Conferences**: published a paper on ICCV 2021. Presented the report LiDAR and Photogrammetry Compared and Combined at the ISPRS GSW 2023 Conference. Participated in 3DV 2018 and 3D-ARCH 2019.
- **Magister Ludi**: PML №239 programming teacher. Supervising 20+ student game dev projects each year.

Education

- Computer Science Center
- ITMO University, Computer Technologies
- PML №239, mathematical circle, programming contests

Contacts

- **PolarNick239@gmail.com**
- **PolarNick.ru**
- **GitHub**
- **LinkedIn**

Last updated: 15.05.2025