Poliarnyi Nikolai
Полярный Николай

Work Experience

- Agisoft

Since April 2016

Mathematician-Programmer (Team Lead)

Metashape developer. R&D and continous search for points of improvement. Invented and developed a detailed, scale-diverse, fast and scalable (out-of-core and cluster-friendly) surface model reconstruction method (published a paper at the top conference ICCV 2021). Invented and developed novel GPU-accelerated algorithms for depth maps reconstruction (OpenCL/CUDA) and out-of-core texture generation (Vulkan).

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

- Transas

October 2014 - March 2016

Mathematician-Programmer

Developed a server that produces 3D landscape reconstruction and true orthophoto stitching from UAVs' data (presentation, second presentation).

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 services to companies and startups on topics related to computer vision algorithms 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. 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.

Education

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

Contacts

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

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