Aleksandr Lomakin, PhD

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Senior Computer Vision Engineer

SUMMARY

3D scanning technology enthusiast with over 15 years experience in 3D scanner design, 3D data processing and C++ computer vision development. Founded a start-up company for the first wireless handheld 3D scanner on the market. Led the development of road lane detection and mapping for self-driving cars. Efficient in research and development of complex computer vision related solutions.

Skills: C++ | OpenCL | CUDA | OpenCV | OpenGL | QT | Boost | Eigen | PCL | Open3D | CGAL | Ceres | g2o | TBB | Git | Conan | Docker | CMAKE | Bash | PyTorch | ROS2 | TensorRT | ONNX | Spark

PROFESSIONAL EXPERIENCE

Wenglor Sensoric Group Munich, Germany
The innovative company for smart sensor and image processing technologies.
R&D Team Lead for 3D Measurement Technologies 12.2022 — up to now

- Over 100x accelerated 3D sensor calibration by re-implementing and optimizing algorithms in C++ and leveraging TBB multithreading.
- Implemented an optimized structured light method to double the speed of point cloud acquisition.
- Developed a semi-supervised anomaly detection method based on the VAE approach.
- Successful supervision of a working student in research for a bachelor's degree in the field of applied physics.

Sber Automotive Technologies Moscow, Russia
Creates unmanned services and logistic solutions.
Senior Computer Vision Engineer 08.2021 — 12.2022

- Developed from scratch the DL solution for lane detection and classification based on a modified YoloP approach.
- 5x accelerated the lane detection neural network through the use of multithreaded C++, CUDA and TensorRT.
- Implemented a real-time algorithm of a road lane network mapping on a LIDAR point cloud around a self-driving car using the g2o library, CUDA and ROS2.
- Introduced a dataset generation system in Apache Spark as part of the Dagster MLOps framework. This system allows operators to choose the time of a day, a season, and a geo-location.
- Implemented a MLOps metrics aggregation system for regular assessment of ML projects and experiments using OpenSearch, ClickHouse, Metabase and Grafana.

Thor3D Moscow, Russia
A start-up creating unique 3D portable scanning technologies.
R&D Computer Vision Team Lead 04.2015 — 08.2021

- Developed a new family of hand-held 3D scanners, featuring a user-friendly built-in touch screen, which is used in more than 60 countries around the world. This product won the iF Design Award in 2021.
- Designed the first ever wireless hand-held 3D scanner with interchangeable lenses and replaceable battery.
- Developed a complete self-sufficient software suite for calibration, efficient 3D data processing, and measurements.

Artec3D Moscow, Russia
A manufacturer of 3D scanning hardware and software.
Computer Vision Engineer 08.2011 — 04.2015

- Developed from the ground up a brand-new 3D scanner Artec Spider resolving a variety of problems from the optics design and calibration to metrology software and an original patented 3D reconstruction method.
- Improved the reconstruction quality of the Artec Eva 3D scanner by optimizing the reconstruction algorithm and rethinking the calibration process which made it possible to scan shiny black objects.
- Contributed to the evolution of Artec Studio 3D software by developing multiple 3D data reconstruction, registration, texturing algorithms, and various 3D measurement tools.
- Implemented a certification of 3D scanners according to the VDI/VDE 2634 standard to promote the metrological reliability of the brand for industrial use.

All-Russian Research Institute for Optical and Physical Measurements Moscow, Russia
The leading research institute for the development of methods and instrumentation for optical and physical measurements.
PhD Researcher in Optics and Metrology 12.2004 — 08.2011

- Developed a 3D interferometric micro-measurement scanner with a versatile research software suite for phase shifting and Fourier transform phase reconstruction, closed-loop fringe pattern demodulation and various metrology measurements.
- Developed in collaboration with EGSolutions (Italy), an intraoral structured light 3D scanner based on the Fourier transform technique with a feature-rich GUI application for reconstruction and hardware calibration.
- Developed the national primary standard for ellipsometric angle units as part of the PhD program.
- Contributed to the development of tomography research software based on Fourier interferometry using Matlab and C++, by introducing the regularized Radon transform method applied to interferometric images.

EDUCATION

All-Russian Research Institute for Optical and Physical Measurements Moscow, Russia
PhD, Optics/Optical Sciences 2004 — 2011

Bauman Moscow State Technical University Moscow, Russia
Master's degree, Biomedical Engineering, Specialist (Diploma with Honors) 1998 — 2004

ADDITIONAL INFORMATION

Languages: English (advanced) | French (intermediate) | German (beginner) | Russian (native)