Alexandr Kuznetsov

Machine Learning and Graphics Researcher
Seattle, WA
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Education

University of California, San Diego
PhD in Computer Science   GPA: 3.87   Sept. 2016 - June 2022
- Advisor: Prof. Ravi Ramamoorthi
- Dissertation: Neural Representations for Rendering of Complex Materials
- Research interests:
  - Using Deep Learning to accelerate rendering in Computer Graphics
  - Algorithms for denoising of Monte Carlo renderings using machine learning
  - Neural representation of materials and scenes for 3D graphics

New York University
Bachelor of Arts in Computer Science and Mathematics   GPA: 3.873   Sept. 2011 - May 2014
- Computer Science Prize for Academic Excellence
- Presidential Honors Scholar

Publications

- Rendering Neural Materials on Curved Surfaces
  Alexandr Kuznetsov, Xuezheng Wang, Krishna Mullia, Fujun Luan, Zexiang Xu, Miloš Hašan and Ravi Ramamoorthi
  SIGGRAPH 2022
- NeuMIP: Multi-Resolution Neural Materials
  Alexandr Kuznetsov, Krishna Mullia, Zexiang Xu, Miloš Hašan, and Ravi Ramamoorthi
  SIGGRAPH 2021
- Photon-Driven Neural Reconstruction for Path Guiding
  Shilin Zhu, Zexiang Xu, Tiancheng Sun, **Alexandr Kuznetsov,** Mark Meyer, Henrik Wann Jensen, Hao Su and Ravi Ramamoorthi
  SIGGRAPH 2022
- Hierarchical Neural Reconstruction for Path Guiding Using Hybrid Path and Photon Samples
  Shilin Zhu, Zexiang Xu, Tiancheng Sun, **Alexandr Kuznetsov,** Mark Meyer, Henrik Wann Jensen, Hao Su and Ravi Ramamoorthi
  SIGGRAPH 2021
- Learning Generative Models for Rendering Specular Microgeometry
  Alexandr Kuznetsov, Miloš Hašan, Zexiang Xu, Ling-Qi Yan, Bruce Walter, Nima Kalantari, Steve Marschner, and Ravi Ramamoorthi.
  SIGGRAPH Asia 2019
- Deep Adaptive Sampling for Low Sample Count Rendering
  Alexandr Kuznetsov, Nima Khademi Kalantari, and Ravi Ramamoorthi. *Proceedings of the Eurographics Symposium on Rendering, 2018*
- Multiple Axis-Aligned Filters for Rendering of Combined Distribution Effects
  Lifan Wu, Ling-Qi Yan, **Alexandr Kuznetsov,** Ravi Ramamoorthi.
  Proceedings of the Eurographics Symposium on Rendering, 2017

Work Experience

Intel Graphics Research Organization

AI Researcher   June 2022 - Present
- Undisclosed deep learning/rendering research
- Undisclosed texture compression research
- Mentoring PhD interns in their research projects

Adobe Research

Research Intern   June 2021 - Sep. 2021
- Research in Neural Material representation on curved surfaces
- Geometry processing for Neural Rendering

Facebook Reality Labs (now Meta) - Research

Research Intern   June 2020 - Oct. 2020
- Researched a super-sampling reconstruction algorithm for rendering
- Developed a differentiable PyTorch plugin written in CUDA for forward reprojection
- Extensive temporal reuse and reprojections

NVIDIA Research

Research Intern   June 2019 - Sep. 2019
- Researched an accelerating rendering algorithm using machine learning for real-time graphics
- Created a render-in-the-loop training system using PyTorch and GPU renderer Falcor

Adobe Research

Research Intern   June 2018 - Sep. 2018
- Created deep online learning algorithm for optimizing rending parameters
- Developed an asynchronous system for training and inferencing of neural networks in batches in the context of path-tracing.

Yahoo!

Software Developer Engineer, Associate   Jan. 2015 - Sep. 2016
- Created and improved Apache Traffic Server plugins using Lua for HTTP traffic routing and caching

Undergraduate Research Assistant, NYU

Advisor: Prof. Denis Zorin
- Implemented integral methods for solving incompressible fluids in Matlab
- Code to accurately integrate, differentiate curves, and find centers of mass of objects defined by curves.
- Integrated Stokes kernels with $O(N)$ Direct Solver for Integral Equations on the Plane

Blender Foundation

Google Summer of Code project   May 2013 - Sept. 2013
- Developed code for parallel video processing on CPU and GPU with OpenCL
- Significantly improved the video editor performance on multicore machines with GPUs

Blender Foundation

Google Summer of Code project   May 2012 - Sept. 2012
- Added OpenGL ES for drawing 3D graphics, primarily in the game engine on mobile devices

Skills
- C, C++, CUDA, Python, PyTorch (writing custom CUDA plugins), Mitsuba, OptiX