Ivan Neulander

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Experience

Senior Software Engineer, Google Inc. 2013-Present

Made key contributions to projects involving Image Processing, Computer Vision, Deep Learning:

- Painerly Rendering: Real-time, coherent painterly animations from photographs.
- Deep Stereo: Deep Learning synthesis of novel views from a sparse set of images. My contribution was incorporating LIDAR data into the machine learning model.
- LIDAR visualization: Tools to help visualize colored point clouds from massive Street View LIDAR collections.

Principal Software Engineer, Rhythm & Hues 2002-2013

Led a team of four Software Engineers in charge of Rhythm's proprietary rendering software for photorealistic image syntehsis. A few notable projects:

- Importance sampling strategies for global illumination, including support for area lights, multiple importance sampling, and adaptive importance sampling.
- Efficient rendering algorithms for photorealistic hair and fur, particularly with ray-traced radiance sampling and interactive image-based lighting.
- Noise reduction techniques for irradiance-cached dipole-based (Jensen-Buhler) multiple scattering approximation.
- A multithreaded 2.5D motion blur processor. Quickly became R&H's preferred method for doing motion blur. Adapted to also synthesize stereo camera views.

Software Engineer, Rhythm & Hues 1998-2002

Authored several core frameworks in our renderer, including:

- Scanline hair rendering, based on the work from my Master's thesis.
- Displacement mapping, using dynamic, view-adaptive tessellation.
- A customized texture-space rasterizer for rapidly generating high-resolution textures with geometry-occluded irradiance or displaced shading normals.
- A scripted toolset for multiplatform building, testing, and deployment of Rhythm's proprietary applications and code libraries, with cross-referenced release notes.

Education

Master of Science, University of Toronto 1995-1997

- Master's Thesis: *Rendering Generalized Cylinders using the A-Buffer*

Bachelor of Science (Honours), University of Toronto 1991-1995

- Specialist Degree in Computer Science
- Major in Mathematics, Minor in Philosophy
- Graduated with High Distinction, GPA 4.09

Academic Awards

- *NSERC* postgraduate scholarship, Government of Canada 1995-1997
- Prestigious *National Scholarship*, University of Toronto 1991-1995
- *Canada Scholarship*, Government of Canada 1991-1995
- *Lieutenant-Governor's award* for academic excellence 1995
- St. Michael's College Academic Awards 1993-1994

Technical Skills

Languages: `C`, `C++`, `Python`, `Perl`, `Java`
Related tools: `Linux` tools, multithreading, `OpenGL`