

Ivan Neulander

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Objective to design, implement, and support algorithms in a collaborative setting, with an emphasis on Computer Graphics and Rendering

Experience **Principal Software Engineer, Rhythm & Hues** 2002-present

I lead a team of four Software Engineers in charge of Rhythm's proprietary rendering software. My activities are split between coding (65%) and coordinating with my team and the user community (35%). Some of my notable recent contributions:

- importance sampling strategies for global illumination, including support for area lights, multiple importance sampling, and adaptive importance sampling
- methods for efficiently rendering 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 $2\frac{1}{2}$ D motion blur processor, which has become our preferred method for motion-blurring heavy production renders; recently adapted to synthesize alternate camera views for stereo productions

Software Engineer, Rhythm & Hues 1998-2002

I authored many incipient frameworks in our renderer, most of which are still in production use. These include:

- scanline hair rendering, based on the work from my Master's thesis
- displacement mapping, using dynamic, view-adaptive tessellation
- specialized 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

- pursued Computer Graphics (Rendering) at the Dynamic Graphics Project lab in the Department of Computer Science
- 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++, Perl, some Python and Java
Related tools: gdb, makefiles, pthreads, STL, valgrind, some OpenGL