Matthew Lausch

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About Me

I am a generalist software engineer with eight years experience as a developer on the Autodesk Maya rendering team, now working as an engineer on the Research and Development team at Industrial Light & Magic. I have extensive experience with real time rendering technologies, the Maya scripting and API environments, cross-platform development strategies, the Qt user-interface toolkit, and Agile development methodologies.

At Autodesk I collaborated with engineers from most major film and video game studios to aid them in the integration of Maya into their pipelines. At ILM I have contributed significantly to the company's Virtual Production efforts, more widely known as StageCraft. This experience has given me many opportunities to work directly with VFX clients and key creatives both within ILM and external to the company.

I am interested in opportunities that allow me to leverage my skills and experience in order to pursue my interest in computer graphics specifically as it applies to the film industry.

Skills

- *Programming Languages:* C/C++, Python, MEL
- *Operating Systems:* Linux, Microsoft Windows, OSX
- *Software:* GCC, GDB, Microsoft Visual Studio, Perforce, git, VIM, Autodesk Maya, standard UNIX shell utilities (grep, diff, etc.)
- *Other Experience:* Maya API/scripting; GPU work including OpenGL/DirectX programming and Cg/GLSL/HLSL shader development; web development (HTML, CSS, Javascript, PHP, Apache); GUI development (Qt, wxWidgets, GTK); database management (SQL, Oracle); system and network administration; significant on-set experience
- Excellent written and oral communication skills

Education

- Honours Bachelor of Mathematics in Computer Science. University of Waterloo, Waterloo, Ontario, Canada. Graduated 2006 with Distinction (Dean's Honours List).

Work Experience

Industrial Light & Magic (Lucasfilm): San Francisco, California, USA
Research & Development Engineer, ILM R&D Team: July 18, 2014 – present
- Member of the Virtual Production R&D team and the Animation/CreatureDev R&D team
- Key contributor to the StageCraft project, culminating so far in the LED volume work used on "The Mandalorian" TV show airing on Disney+
- Investigative and production work with Virtual Reality, Augmented Reality, motion capture technologies, video processing hardware
- Regular on-set experience supporting Virtual Production projects for ILM
- Key contributor to real-time rendering technologies embedded in ILM's proprietary framework in support of Virtual Production workflows

- Build-out, design, maintenance, and deployment work for hardware systems deployed to filming locations around the world
- Regular contact and support for key creatives both internal and external to ILM
- Responsible for the maintenance of existing versions of Maya in the ILM pipeline and for the deployment of new versions as they become available
- Regular collaboration with other technical workers at all ILM studios around the world as well as with technical employees at other companies in the Disney family (Pixar, Walt Disney Animation, Walt Disney Imagineering, Disney Research, etc.)
- Significant contributions to many ILM productions including: Star Wars: The Force Awakens, Captain America: Civil War; Warcraft; Rogue One: A Star Wars Story; Carne y Arena; Star Wars: The Last Jedi; Ready Player One; The Irishman; The Mandalorian
- Introduced and maintain the OpenGrok source code indexing service to great acclaim
- Developed several tools to support ILM's asset pipeline
- Architected a new viewport image caching framework within Maya for use by animators

Autodesk: Toronto, Ontario, Canada
Senior Software Engineer, Maya Rendering Team: September 5, 2006 – July 4, 2014
Viewport 2.0, 2009-2014
- Lead engineer on the Viewport 2.0 project; seeking to replace Maya's legacy, fixed-function, OpenGL viewport with a modern, high quality, high performance, API-agnostic, real-time rendering system based on the OGS library: an Autodesk-developed toolkit for advanced GPU rendering
- Extensive work with OpenGL, DirectX, Cg and HLSL shader authoring, scene acceleration structures, and advanced rendering techniques (order-independent transparency, screen-space effects, volume rendering, etc.)
- Responsible for the development and maintenance of much of the Viewport 2.0 public API as well as its documentation in the Maya API guide (published on the Autodesk website)
- Frequent Viewport 2.0 plug-in development (internal plugins, devkit samples, etc.)
- Regular interaction with customers to aid in the adoption of Viewport 2.0 in their pipelines (ILM, Pixar, WDAS, SPI, Double Negative, Dreamworks, Weta, EA, SCE, etc.)
- Significant experience debugging graphics problems due to platform differences (Windows/OSX/Linux), vendor differences (nVidia/AMD/Intel) and driver problems
- Regularly provide guidance to other Maya teams looking to leverage the new features and benefits of Viewport 2.0 in their work (modeling, animation, dynamics, etc.)
- Regularly provide technical leadership to junior developers working on the project, including design decisions and code reviews
- Daily interactions with team members distributed around the globe
- Aided in creation and maintenance of a large regression test suite
- Gave a talk on Viewport 2.0 at a company-wide internal developer conference in Shanghai in 2010

Maya Qt Port, 2008-2009
- Contributing member on the staggeringly massive project to port the Maya user-interface layer from legacy, platform-specific UI toolkits to the cross-platform Qt toolkit
- Gained deep knowledge of Qt and of the intricacies of Maya's custom user-interface widgets and behaviours

Mental Ray for Maya, 2006-2008
- Lead engineer on the mental ray for Maya plugin for two years, requiring strong communication skills to effectively work with mental ray engineers in Germany, local documentation, QA, and product design
- Extensive work with the Maya API, MEL and Python scripting, various profiling tools, the mental ray API and mental ray shader development, all in a multi-platform environment (Windows/OSX/Linux)

- One of three developers on the Maya render pass system, for which we were awarded two patents (see Patents section below)

General Maya Rendering, 2006
- Feature, performance and maintenance work on general Maya rendering features
- Assisted with the implementation of the original Python wrappers for the Maya C++ API (using SWIG) and gave a short talk to ILM pipeline and R&D engineers on the topic

Alias: Toronto, Ontario, Canada
Software Development Intern, User Experience Team: September 5, 2005 – December 22, 2005
- Worked with the User Experience team to develop and refine user interface components for Autodesk Showcase, a real-time 3D visualization solution
- Developed complex UI components using C++, Python and wxWidgets
- Developed an interactive, direct texture manipulation tool that can be used to adjust the offset, scale and rotation of projective (planar, triplanar, cylindrical) textures
- Developed code to generate cinematic camera motion paths using simple Bezier splines

Software Development Intern, Maya Foundation Team: January 3, 2005 – April 29, 2005
- Performed various Maya development tasks in C++ and MEL on Windows and Linux, primarily assisting the Maya x86-64 porting effort
- Used Perl to enhance the Maya nightly testing framework

NORTH Network: Toronto, Ontario, Canada
Web Developer: May 3, 2004 – August 27, 2004
- Worked on a complex, mission-critical, J2EE scheduling application connecting health care workers with patients in remote communities using telepresence technology
- Planned, designed and developed a complete, automated acceptance and regression test suite using JMeter and Ant
- Built, configured, deployed and maintained the production machines for the application

Patents

United States Patent 8,379,024
> Modular shader architecture and method for computerized image rendering
> Justin Novosad, Eric Bourque, Matthew Lausch
> Awarded February 19, 2013

United States Patent 8,416,238
> Modular shader architecture and method for computerized image rendering
> Justin Novosad, Eric Bourque, Matthew Lausch
> Awarded April 9, 2013

Credits (see: https://www.imdb.com/name/nm7079036)

- **The Mandalorian: Season 1, Chapters 1-8** -- Virtual Production "Brain Bar" Crew
- **Vader Immortal: A Star Wars VR Series - Episode III** -- Motion Capture Crew
- **Vader Immortal: A Star Wars VR Series - Episode II** -- Motion Capture Crew
- **Captain Marvel** -- Technology: ILM
- **Star Wars: Episode 8 - The Last Jedi** -- Technology: ILM
- **Carne y Arena** -- Technology Support: ILMxLAB
- **Captain America: Civil War** -- Technology: ILM
- **Strange Magic** -- Research & Development: ILM

Awards, Achievements

- Graduated from my undergraduate studies with Distinction, Dean's Honours List (88% cumulative average), Fall 2006
- Awarded silver medal on final Computer Graphics project, Summer 2005
- Valedictorian for graduating class at Medway High School, June 2001
- Chief Scout Award, May 1997

Interests and Hobbies

- Technology of all kinds, computer graphics (and the associated mathematics), ray tracing
- Photography, literature, classical music, cooking
- Craft beer, single malt scotch whisky, very dark single-origin chocolate
- Rock climbing, snowboarding, camping, canoeing
- World travel
- Personal website development