

# Matthew Kaplan, Ph.D.

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## Summary

A senior software engineer with 8 years professional software development experience and a PhD in Computer Science. I have in depth experience with architecting, creating, deploying, and maintaining world class software solutions. I have an extensive background in computer science research with interests in a wide variety of topics and a specialization in computer graphics and non-photorealistic rendering. I have numerous publications in the field of computer graphics including several that were included in Siggraph courses and textbooks as seminal work in the field of non-photorealistic rendering.

I am looking for a career position as either a senior software engineer or software engineering manager. I am results driven and passionate about producing world class software solutions.

## Professional Experience

**NVIDIA Corporation** – Senior 3D System Software Engineer, May, 2007-present. Working with the [DirectX driver](#) team to produce world class software in support of graphics hardware(GPU)/OS interaction. Including:

- Maintaining and supporting one of the largest graphics API's in the world used by millions on a daily basis. Skills/Responsibilities include: GPU architecture, graphics algorithms, architecting API's, system level software development, OS internals, assembly programming, User mode and Kernel mode development, creative problem solving, advanced hardware and software debugging, code optimization and high level software engineering practice.
- Was one of two principal architects and developers of the [Nvidia Direct Compute](#) driver that implemented system level support and API's for DirectX Compute on all Nvidia GPU's. Delivered this from concept to implementation within 3 months. Grew it across several revisions of DirectX, including backwards compatibility for GPU architectures that did not have hardware support for all GPU compute operations. This driver is currently used on all modern Nvidia GPU's and in many games and applications.
- Chief driver architect and developer of the [Nvidia GeForce Experience](#) driver. I worked with the user analytics software group to architect and deliver an API to connect the GFE software platform and a massive user database to our driver internals for tracking, analysis and optimization. Solved several key problems related to data collection, analysis and compression across a massively distributed network (this software connects every end user PC containing an Nvidia GPU). This initiative produced several company patents.
- Implemented internal tools for performing large scale unit testing of new hardware and API's in development. Delivered a nightly testbed that stresses both performance and functionality of all new software changes across new and existing hardware.
- Developed new features and driver optimizations for operating systems in development (Windows 7, 8, 8.1) and API's (Direct X 10, 10.1, 11, 12) in advance of their release.

**INRIA** (l'Institut National de Recherche en Informatique et Automatique – translation: French National Institute of Research in Computer Science and Automation) – PostDoctoral Fellow. 2005-2007.

- Research and development in computer graphics with both the Inria Labri and Artis groups.
- Numerous juried publications were produced (listed below).
- Mentored undergraduate students and helped direct research activities for several masters level graduate students.

**University of Utah, Computer Science** – Research Assistant. July 1998- May, 2005.

- Research and development in computer graphics with the Graphics, Alpha1, SciVis and NPR groups.
- Developed CAD/CAM software for Alpha1 project

- Numerous juried publications were produced (listed below).

## Academic History

**PostDoctoral Fellow** – INRIA (l'Institute Nationale de Recherche en Informatique et Automatique), 2005-2007.  
Advisors: Gwenola Thomas, Xavier Granier, Joelle Thollot

**PhD.** – Computer Science, University of Utah, Salt Lake City, Utah, 2005  
Dissertation title : *Artistic Graphics and Modeling*. Advisor: Elaine Cohen. A collection of novel methods for rendering, modeling, and incorporating artistic techniques in computer graphics.

**Bachelor of Science** – Majors: Computer Science / Studio Art, Minor: French, Bowdoin College. Brunswick, ME.,USA, 1994-1998

## Skills

**Systems** – Windows (Xp/Vista/Win7/Win8/Win8.1/WinNext), Unix, Linux

**Languages** – C++/C, Java, DirectX, OpenGL, Many common languages (Java/Html/Perl/Etc.)

**Tools** – Visual Studio, Gnu tools, Emacs, Windbg, CVS / Perforce / Subversion, GPUView, Etc.

**Skills** – Object oriented code, Portable code, Multi-platform development, Code design and optimization, Large scale product design and rollout, API analysis and implementation, System/OS engineering, Performance analysis, Unit test engineering, Project management, GPU Architecture and algorithms, Computer graphics algorithms, Non-photorealistic rendering algorithms, Intern development

## Juried Publications

- Matthew Kaplan and Elaine Cohen, "Reconstructing the Frontal Geometry of Drawings of Arbitrary Surfaces", *Computers & Graphics* 2007
- Matthew Kaplan, "Hybrid Quantitative Invisibility", *Non-Photorealistic Animation and Rendering* 2007
- Matthew Kaplan and Elaine Cohen, "Producing Models from Line Drawings of Curved Surfaces", *Sketch Based Interfaces and Modeling* 2006  
**Best Paper Award**
- Adrien Bousseau, Matthew Kaplan, Joelle Thollot, Francois Sillion, "Interactive Watercolor Rendering with Temporal Coherence and Abstraction", *Non-Photorealistic Animation and Rendering (NPAR)* 2006
- Matthew Kaplan and Elaine Cohen, Automating Cinematographic Stylizations – Expressive Rendering, *Computational Aesthetics* 2005
- Matthew Kaplan and Elaine Cohen, A Generative Model for Dynamic Canvas Motion, 2004, *Computational Aesthetics*, 2005
- Matthew Kaplan, Emil Praun and Elaine Cohen, "Pattern Oriented Remeshing for Celtic Decoration", *Pacific Graphics* 2004
- Matthew Kaplan and Elaine Cohen, "Computer Generated Celtic Design", *Eurographics Symposium on Rendering* 2003
- Matthew Kaplan, Bruce Gooch and Elaine Cohen, "Interactive Artistic Rendering", *Non-Photorealistic Animation and Rendering (NPAR)* 2000
- David E. Johnson, Thomas V. Thompson II, Matthew Kaplan, Donald Nelson, and Elaine Cohen, "Painting Textures with a Haptic Interface," *Virtual Reality* 1999 (VR'99)

## Non-Juried Publications

- Matthew Kaplan, Artistic Graphics and Modeling. PhD Dissertation, 2005
- Matthew Kaplan and Elaine Cohen, A Wavelet Basis For Multiresolution Painterly Rendering, Technical Report, University of Utah. 2002

### Reviewer for Professional Journal

- Siggraph
- Non-Photorealistic Rendering and Animation (NPAR)
- Eurographics
- Eurographics Rendering Workshop
- Pacific Graphics
- Computer Graphics and Applications (CG&A)

### References in Textbooks

- Bruce Gooch and Amy Gooch, "Non-Photorealistic Rendering", AK Peters, Ltd., 2001, pgs. 86-91, 154,186.
- Tomas Akenine-Möller and Eric Haines, "Realtime Rendering", AK Peters Ltd.,
- Recent Advances in Non-Photorealistic Rendering for Art and Visualization, Siggraph Course Notes, 2002, pgs. 67-74
- Thomas Strothotte, Stefan Schlechtweg, Non-photorealistic computer graphics: modeling, rendering and animation, Morgan Kaufmann, 2002
- Weidong Geng, The Algorithms and Principles of Non-photorealistic Graphics, Springer, 2010, numerous references

### References

<p>Professor Elaine Cohen University of Utah School of Computing 50 South Central Campus Drive, Room 3190 Salt Lake City, Utah 84112-9205 Phone : (801) 581-5843 <a href="mailto:cohen@cs.utah.edu">cohen@cs.utah.edu</a></p>	<p>Professor Bruce Gooch University of Victoria Engineering/ Computer Science Building, Room 504 PO Box 1700, STN CSC Phone: (250) 472 - 5758 <a href="mailto:brucegooch@gmail.com">brucegooch@gmail.com</a></p>
<p>Professor Peter Shirley Principal Research Scientist, NVIDIA Research University of Utah School of Computing 50 South Central Campus Drive, Room 3190 Salt Lake City, Utah 84112-9205 (801) 581-5290 <a href="mailto:shirley@cs.utah.edu">shirley@cs.utah.edu</a></p>	<p>Ali Ibrahim Fellow, AMD Corporation, SOC/System Architecture and Low Power Design One AMD Place, P.O. Box 3453 Sunnyvale, CA, 94088 (800) 538-8450, Ext. 4377 <a href="mailto:Ali.ibrahim@amd.com">Ali.ibrahim@amd.com</a></p>
<p>Cody Robson Nvidia Corporation, Senior Software Engineer (408) 387-0422 <a href="mailto:codyrobson@gmail.com">codyrobson@gmail.com</a></p>	<p>Professor Mathew B. Bradbury Queens College, City University of New York Phone: (347) 210-6046 <a href="mailto:mathew.bradbury@qc.cuny.edu">mathew.bradbury@qc.cuny.edu</a></p>
<p>Professor Xavier Granier Domaine Universitaire 351, Cours de la Liberation 33405 Talence Cedex France Phone : (+33) 5 40 00 37 95 <a href="mailto:granier@labri.fr">granier@labri.fr</a></p>	<p>Shaun Nirenstein R&amp;D Architect, Jump Trading LLC (formerly Software Engineering Manager at Nvidia Corporation) 600 West Chicago Ave. Chicago, Illinois 60654 (312) 205-8200 <a href="mailto:snirenstein@facebook.com">snirenstein@facebook.com</a></p>

