Matthew Fisher

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Education

Stanford University, Stanford, CA — September 2013
Ph. D., Computer Science, GPA 4.15 / 4.2
Advised by Pat Hanrahan
Thesis: *Data-driven Tools for Scene Modeling*

Stanford University, Stanford, CA — September 2010
Masters of Science, Computer Science, GPA 4.15 / 4.2

California Institute of Technology, Pasadena, CA — June 2007
Bachelor of Science, Computer Science, GPA 3.9 / 4.2
Advised by Peter Schröder and Mathieu Desbrun

Research Interests

Machine learning, computer graphics, data science, example-driven modeling, computer vision, task automation

Languages (in order of experience)

C++, C, C#, CUDA, Java, Scala

Employment

Adobe Research, Stanford, CA — 9/2013 – 9/2016
Research Scientist, Creative Technologies Lab

Teapot, Palo Alto, CA — 3/2016 – 6/2016
Computer Vision and Deep Learning Consultant

Khan Academy, Mountain View, CA — 2014
Data Scientist, Machine Learning Team

Stanford Computer Graphics Laboratory, Stanford, CA — 9/2013 – 9/2016
Postdoctoral Researcher, 3D Reconstruction and NLLS Optimization Groups

Stanford Computer Graphics Laboratory, Stanford, CA — 9/2009 – 9/2013
Research Assistant, Probabilistic Modeling and Content Generation Groups
With Professor Pat Hanrahan, I combine emerging 3D datasets with machine learning to power a new class of 3D modeling systems. My research focuses on learning the common relationships between objects from a database of examples, then using this understanding to enable complex tools such as scene or model retrieval, completion, and synthesis.

Stanford University, Stanford, CA — 6/2009 – 9/2009
Instructor, CS 148: Introduction to Computer Graphics and Imaging
Developed course material and assignments, as well as delivering both televised and in-person lectures. Coordinated the class schedule and structure with two teaching assistants.

Stanford Computer Graphics Laboratory, Stanford, CA 1/2008 – 9/2009

Research Assistant, Micropolygon Rendering Group

Working with Kayvon Fatahalian (CMU), I developed new algorithms for creating seamless and adaptive tessellations of geometric surfaces that can be easily parallelized. Our research significantly reduces the overhead incurred when the modern real-time graphics pipeline is used to produce scenes with very high geometric detail.

Microsoft, Seattle, WA 6/2007 – 9/2007

Software Design Engineer Intern, DirectX SoftGPU Team

Designed a kernel driver that implements the Windows graphics driver model entirely in software. This project was used to design and test the next generation of the Windows Display Driver Model without the need to wait for hardware vendors to produce hardware and drivers that correctly implements the new model.

Microsoft, Seattle, WA 6/2005 – 9/2005, 6/2006 – 9/2006

Software Design Engineer Intern, DirectX Kernel Team

Created GPUView, a comprehensive tool for investigating graphics performance issues by capturing the graphics events on a live system and allowing retrospective playback and analysis. Seven years later, this tool is still in use by Microsoft and its hardware partners and ships with the Windows 7 SDK and DDK.

California Institute of Technology, Pasadena, CA 6/2004 – 9/2004

Physics Researcher under Thomas Tombrello, funded by the Richard Brewer prize

Investigated new approaches to valuing employee stock options on corporate earnings reports, which can have a significant impact on how investors perceive a company's economic well-being. The focus was on alternatives to idealized valuation models, such as Black-Scholes, which rely upon unknown or implied volatility that cannot be accurately measured.

Publications

Conference Papers

[1] **Probabilistic Color-by-Numbers: Suggesting Pattern Colorizations Using Factor Graphs**
Lin, S., Ritchie D., **Fisher, M.** and Hanrahan P.
ACM SIGGRAPH 2013

[2] **Example-based Synthesis of 3D Object Arrangements**
Fisher, M., Ritchie D., Savva M., Funkhouser T., and Hanrahan P.
ACM SIGGRAPH Asia 2012

[3] **Synthesis of Tiled Patterns using Factor Graphs**
Yeh, Y., Breeden K., Yang L., **Fisher, M.**, and Hanrahan P.
Transactions on Graphics August 2012, to be presented at ACM SIGGRAPH 2013

[4] **Characterizing Structural Relationships in Scenes Using Graph Kernels**
Fisher M., Savva M., and Hanrahan P.
ACM SIGGRAPH 2011

[5] **Context-Based Search for 3D Models**
Fisher M. and Hanrahan P.
ACM SIGGRAPH Asia 2010

[6] **DiagSplit: Parallel, Crack-Free, Adaptive Tessellation for Micropolygon Rendering**
Fisher M., Fatahalian K., Boulos S., Akeley K., Mark B., and Hanrahan P.
ACM SIGGRAPH Asia 2009

[7] **Design of Tangent Vector Fields**
Fisher M., Schröder P., Desbrun M., and Hoppe H.
ACM SIGGRAPH 2007

SIGGRAPH Course Note Proceedings

[1] **Constructing Intrinsic Delaunay Triangulations**
Fisher, M., Springborn B., Bobenko A., and Schröder P.
ACM SIGGRAPH 2006 Courses, Discrete Differential Geometry

Patents

[1] **Kernel Event Visualization**
http://www.faqs.org/patents/app/20080276252
Steve Pronovost, Ameet Chitre, and Matthew Fisher
Accepted November 2008

Awards

Hertz Foundation Applied Science Fellowship	**Hertz Foundation, Eric Wepsic**
Housner Award for Undergraduate Achievement	**California Institute of Technology**
Upper Class Merit Award	**California Institute of Technology**
Barry M. Goldwater Scholarship	**US Government**
Bhansali prize for best undergraduate researcher in CS	**California Institute of Technology, CS Faculty**
Fred V. and Marvis B. Maloney Scholarship	**California Institute of Technology**
Richard Brewer prize for best physics research solution	**California Institute of Technology, Physics Faculty**

Reviewing

SIGGRAPH 2008 – 2016
SIGGRAPH Asia 2011 – 2016

Press

[1] **Google's DeepMind AI takes on StarCraft II**
http://www.espn.com/esports/story/_/id/18125143/google-deepmind-artificial-intelligence-takes-starcraft-ii
[2] **StarCraft 2 AI hacks its way to victory, October 2011**
http://www.extremetech.com/gaming/102413-starcraft-ii-playing-artificial-intelligence-shows-promise
[3] **StarCraft 2 AI Through D3D Capture, October 2011**
http://cplus.about.com/b/2011/10/28/starcraft-2-ai-through-d3d-capture.htm
[4] **Starcraft 2 API for Bots/AI, November 2011**
http://blog.wetfish.net/starcraft-2-api-for-bots-ai/
[5] **Starcraft 2 Automated Player, November 2011**
http://thecognitivegamer.wordpress.com/2011/10/27/starcraft-2-automated-player/
[6] **Extravagant Cheating via Direct X, February 2012**
http://www.altdevblogaday.com/2012/04/02/extravagant-cheating-via-direct-x/

Teaching

Instructor (Summer 2009)
Dept. of Computer Science, Stanford University, Stanford, CA
Introduction to Computer Graphics and Imaging (CS148)

Teaching Assistant (Winter 2008, Summer 2008)
Dept. of Computer Science, Stanford University, Stanford, CA
Introduction to Computer Graphics and Imaging (CS148)

Teaching Assistant (Fall 2005, Winter 2006)
Dept. of Computer Science, California Institute of Technology, Pasadena, CA
Learning Systems (CS/CNS/EE 156a)
Projects in Learning Systems (CS/CNS/EE 156b)

References

Pat Hanrahan
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Thomas Funkhouser
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Princeton University
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(609) 258-1748

Mathieu Desbrun
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California Institute of Technology
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(626) 395-6230

Hugues Hoppe
Principal Researcher & Manager
Microsoft Research
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(800) 642-7676

Scott Klemmer
Professor
Stanford University (moving to UCSD)
srk-admin@cs.stanford.edu
(650) 723-3692