

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, content generation, example-driven modeling, computer vision, game learning.

Languages (in order of experience)

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

Employment

- Stanford Computer Graphics Laboratory**, Stanford, CA 9/13 – Present
Postdoctoral Researcher, 3D Reconstruction and NLLS Optimization Groups
- Stanford Computer Graphics Laboratory**, Stanford, CA 9/09 – 9/13
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 6/09 – 9/09
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 1/08 – 9/09
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 6/07 – 9/07
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

6/05 – 9/05, 6/06 – 9/06

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

6/04 – 9/04

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
Housner Award for Undergraduate Achievement
Upper Class Merit Award
Barry M. Goldwater Scholarship
Bhansali prize for best undergraduate researcher in CS
Fred V. and Marvis B. Maloney Scholarship
Richard Brewer prize for best physics research solution

Hertz Foundation, Eric Wepsic
California Institute of Technology
California Institute of Technology
US Government
California Institute of Technology, CS Faculty
California Institute of Technology
California Institute of Technology, Physics Faculty

Reviewing

SIGGRAPH 2008 – 2015
SIGGRAPH Asia 2011 – 2015

Press

- [1] **StarCraft 2 AI hacks its way to victory, October 2011**
<http://www.extremetech.com/gaming/102413-starcraft-ii-playing-artificial-intelligence-shows-promise>
- [2] **StarCraft 2 AI Through D3D Capture, October 2011**
<http://cplus.about.com/b/2011/10/28/starcraft-2-ai-through-d3d-capture.htm>
- [3] **Starcraft 2 API for Bots/AI, November 2011**
<http://blog.wetfish.net/starcraft-2-api-for-bots-ai/>
- [4] **Starcraft 2 Automated Player, November 2011**
<http://thecognitivegamer.wordpress.com/2011/10/27/starcraft-2-automated-player/>
- [5] **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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Stanford University
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(650) 723-8530

Mathieu Desbrun

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California Institute of Technology
mathieu@cms.caltech.edu
(626) 395-6230

Scott Klemmer

Professor
Stanford University (moving to UCSD)
srk-admin@cs.stanford.edu
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Thomas Funkhouser

Professor
Princeton University
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Hugues Hoppe

Principal Researcher & Manager
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