

# DANIEL RITCHIE

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## EDUCATION

### Stanford University

PhD, Computer Science

Dissertation: *Probabilistic Programming for Procedural Modeling and Design*

Advisors: Pat Hanrahan, Noah Goodman

Conferred September 2016

### Stanford University

MS, Computer Science

Conferred April 2013

### University of California Berkeley

BA, Computer Science

Conferred May 2010

## REFEREED PUBLICATIONS

**Neurally-Guided Procedural Models: Amortized Inference for Procedural Graphics Programs using Neural Networks.** Daniel Ritchie, Anna Thomas, Pat Hanrahan, Noah D. Goodman. *NIPS 2016*.

**C3: Lightweight Incrementalized MCMC for Probabilistic Programs using Continuations and Callsite Caching.** Daniel Ritchie, Andreas Stuhlmüller, Noah D. Goodman. *AISTATS 2016*.

**Controlling Procedural Modeling Programs with Stochastically-Ordered Sequential Monte Carlo.** Daniel Ritchie, Ben Mildenhall, Noah D. Goodman, and Pat Hanrahan. *SIGGRAPH 2015*.

**Generating Design Suggestions under Tight Constraints with Gradient-based Probabilistic Programming.** Daniel Ritchie, Sharon Lin, Noah D. Goodman, and Pat Hanrahan. *Eurographics 2015*. BEST PAPER HONORABLE MENTION.

**Quicksand: A Lightweight Embedding of Probabilistic Programming for Procedural Modeling and Design.** Daniel Ritchie. *The 3rd NIPS Workshop on Probabilistic Programming, 2014*.

**First-class Runtime Generation of High-performance Types using Exotypes.** Zach Devito, Daniel Ritchie, Matthew Fisher, Alex Aiken, and Pat Hanrahan. *PLDI 2014*.

**Probabilistic Color-by-Numbers: Suggesting Pattern Colorizations Using Factor Graphs.** Sharon Lin, Daniel Ritchie, Matthew Fisher, and Pat Hanrahan. *SIGGRAPH 2013*.

**Example-based Synthesis of 3D Object Arrangements.** Matthew Fisher, Daniel Ritchie, Manolis Savva, Thomas Funkhouser, and Pat Hanrahan. *SIGGRAPH Asia 2012*.

**d.tour: Style-based Exploration of Design Example Galleries.** Daniel Ritchie, Ankita Arvind Kejriwal, and Scott R. Klemmer. *UIST 2011*.

**Dynamic Local Remeshing for Elastoplastic Simulation.** Martin Wicke, Daniel Ritchie, Bryan M. Klingner, Sebastian Burke, Jonathan R. Shewchuk, and James F. O'Brien. *SIGGRAPH 2010*.

**Interactive Simulation of Surgical Needle Insertion and Steering.** Nuttapong Chentanez, Ron Alterovitz, Daniel Ritchie, Lita Cho, Kris K. Hauser, Ken Goldberg, Jonathan R. Shewchuk, and James F. O'Brien. *SIGGRAPH 2009*.

**TECHNICAL  
REPORTS**

**Learning to Infer Graphics Programs from Hand-Drawn Images.** Kevin Ellis, Daniel Ritchie, Armando Solar-Lezama, Joshua B. Tenenbaum. *arXiv:1707.09627, 2017*.

**Deep Amortized Inference for Probabilistic Programs.** Daniel Ritchie, Paul Horsfall, Noah D. Goodman. *arXiv:1610.05735, 2016*.

**BOOK  
CHAPTERS**

**Probabilistic Programming for Procedural Modeling and Design.** Daniel Ritchie, Pat Hanrahan, Noah D. Goodman. In Vikash Mansinghka and Daniel Roy (Eds.), *Probabilistic Programming (working title; in preparation)*.

**INVITED  
TALKS**

**Probabilistic Programming for Procedural Modeling and Design**  
Adobe Systems, *Creative Technologies Lab* March 2016  
Brown University, *Computer Science Department* February 2016  
Harvey Mudd College, *Computer Science Department* February 2016  
Yale University, *Computer Science Department* February 2016

**Creative AI for Computer Graphics (It's More Than Just Style Transfer)**  
Google Brain, *Magenta Group* January 2017

**Learning and Inferring Graphics Programs**  
Massachusetts Institute of Technology, *Vision Seminar* September 2017

**PANELIST**

Advances in Software for Approximate Bayesian Inference. *NIPS 2016 Workshop on Advances in Approximate Bayesian Inference*.

**EMPLOYMENT**

**Assistant Professor** Providence, RI  
Brown University Computer Science Department 2017 – Present

**Postdoctoral Researcher** Stanford, CA  
Stanford University Computer Science Department 2016 – 2017

**Research Intern** San Francisco, CA  
Adobe Creative Technologies Lab Summer 2011

**Graduate Research Assistant** Stanford, CA  
Stanford University Computer Science Department 2010 – 2016

**Technical Director Intern** Emeryville, CA  
Pixar Animation Studios Summer 2009

**Software Intern** Roseville, CA  
Hewlett-Packard Summer 2008

<b>TEACHING</b>	<b>Instructor</b>	Fall 2017
	Brown CS 2951-W: Creative Artificial Intelligence for Computer Graphics	
	<b>Instructor</b>	Summer 2016
	DARPA Probabilistic Programming for Advanced Machine Learning Summer School	
	<b>Course Assistant</b>	Spring 2014
	Stanford CS 348b: Image Synthesis Techniques	
	<b>Course Assistant</b>	Fall 2011
Stanford CS 148: Introduction to Computer Graphics and Imaging		
<b>ADVISING &amp; MENTORING</b>	<b>Graduate Student Instructor</b>	Fall 2009, Spring 2010
	UC Berkeley CS 184: Foundations of Computer Graphics	
	<b>Student Facilitator</b>	Spring 2009 – Spring 2010
	UC Berkeley Undergraduate Graphics Group	
	<b>Tutor</b>	Fall 2008
	UC Berkeley Self-Paced Center	
	Anna Thomas	Stanford CS BS (expected 2018)
Sarah Jobalia	Stanford CS MS (expected 2018)	
Maxime Voisin	Stanford MS&E MS (expected 2018)	
Shreya Shankar	Stanford CS BS (expected 2019)	
Ben Mildenhall	Stanford CS BS 2015	
<i>Next position: PhD Student, UC Berkeley</i>		
<b>AWARDS &amp; HONORS</b>	Eurographics Best Paper Honorable Mention	2015
	Stanford Graduate Fellowship	2010
	UC Berkeley EECS Departmental Citation	2010
	UC Berkeley Computer Science Highest Achievement Award	2010
	CRA Outstanding Undergraduate Researcher Honorable Mention	2010
	UC Berkeley Edward Frank Kraft Scholarship	2007
<b>SERVICE</b>	<b>Journal Reviewer</b>	
	Computer Aided Design: 2016 IEEE TVCG: 2016	
<b>OPEN-SOURCE SOFTWARE</b>	<b>Conference Proceedings Reviewer</b>	
	SIGGRAPH: 2016, 2017	
	SIGGRAPH Asia: 2016, 2017	
	UIST: 2016	
	NIPS: 2016	
	Eurographics: 2017	
<b>WebPPL</b>	<a href="http://webppl.org">http://webppl.org</a>	
Probabilistic programming language embedded in Javascript.		

**adnn** <https://www.npmjs.com/package/adnn>  
Pure Javascript library for neural networks and automatic differentiation.

**Quicksand** <http://dritchie.github.io/quicksand>  
Low-level probabilistic programming language embedded in Terra.

**PATENTS**      **Methods and Apparatus for Comic Creation** (US 20130073952 A1)

**REFERENCES**      Pat Hanrahan  
Canon USA Professor of Computer Science  
Stanford University  
[hanrahan@cs.stanford.edu](mailto:hanrahan@cs.stanford.edu)

Noah Goodman  
Associate Professor of Psychology  
Stanford University  
[ngoodman@stanford.edu](mailto:ngoodman@stanford.edu)

Thomas Funkhouser  
Professor of Computer Science  
Princeton University  
[funk@cs.princeton.edu](mailto:funk@cs.princeton.edu)

Frank Wood  
Associate Professor of Engineering Science  
Oxford University  
[fwood@robots.ox.ac.uk](mailto:fwood@robots.ox.ac.uk)