

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

PANELIST

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

EMPLOYMENT

Postdoctoral Researcher Stanford, CA
Stanford University Computer Science Department 2016 – present

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

TEACHING

Instructor Summer 2016
DARPA Probabilistic Programming for Advanced Machine Learning Summer School

Course Assistant Spring 2014
Stanford CS 348b: Image Synthesis Techniques

Course Assistant Fall 2011
Stanford CS 148: Introduction to Computer Graphics and Imaging

Graduate Student Instructor Fall 2009, Spring 2010
UC Berkeley CS 184: Foundations of Computer Graphics

Student Facilitator Spring 2009 – Spring 2010
UC Berkeley Undergraduate Graphics Group

Tutor Fall 2008
UC Berkeley Self-Paced Center

**ADVISING &
MENTORING**

Anna Thomas Stanford CS BS (expected 2018)

Sarah Jobalia Stanford CS MS (expected 2018)

Maxime Voison Stanford MS&E MS (expected 2018)

Shreya Shankar Stanford CS BS (expected 2019)

Ben Mildenhall Stanford CS BS 2015
Next position: PhD Student, UC Berkeley

**AWARDS &
HONORS**

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

SERVICE

Journal Reviewer

Computer Aided Design: 2016

IEEE TVCG: 2016

Conference Proceedings Reviewer

SIGGRAPH: 2016, 2017

SIGGRAPH Asia: 2016, 2017

UIST: 2016

NIPS: 2016

Eurographics: 2017

**OPEN-SOURCE
SOFTWARE**

WebPPL

<http://webppl.org>

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
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Noah Goodman
Associate Professor of Psychology
Stanford University
`ngoodman@stanford.edu`

Thomas Funkhouser
Professor of Computer Science
Princeton University
`funk@cs.princeton.edu`

Frank Wood
Associate Professor of Engineering Science
Oxford University
`fwood@robots.ox.ac.uk`