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

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

REFEREED PUBLICATIONS

Deep Convolutional Priors for Indoor Scene Synthesis Kai Wang, Manolis Savva, Angel X. Chang, Daniel Ritchie. *SIGGRAPH 2018*.

ScanComplete: Large-Scale Scene Completion and Semantic Segmentation for 3D Scans Angela Dai, Daniel Ritchie, Martin Bokeloh, Scott Reed, Jrgen Sturm, Matthias Niener. *CVPR 2018*.

Example-based Authoring of Procedural Modeling Programs with Structural and Continuous Variability Daniel Ritchie, Sarah Jobalia, Anna Thomas *Eurographics 2018*.

An Improved Training Procedure for Neural Autoregressive Data Completion. Maxime Voisin, Daniel Ritchie. *NIPS 2017 Bayesian Deep Learning Workshop*.

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.*

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
MIT, *Vision Seminar* September 2017

Inferring Graphics Programs
University of Washington, *ML+PL Workshop* Feburary 2018

Learning from Large-Scale Synthetic 3D Scene Data
Brown University Data Science Initiative, *Datathon* March 2018

Learning Procedural Modeling Programs from Examples
MIT, *New England Symposium on Graphics* April 2018 Microsoft Research
Cambridge, *New England Machine Learning Day* May 2018

PANELIST

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

TEACHING

Instructor Spring 2018
Brown CSCI 1470/2470: Deep Learning

Instructor Spring 2018
Brown CSCI 2240: Interactive Computer Graphics

Instructor Fall 2017
Brown CSCI 2951-W: Creative Artificial Intelligence for Computer Graphics

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

Kai Wang — Brown CS PhD (current)

Yifan Liu — Brown CS M.S. (expected 2019)

Ruolan Tang — Brown CS M.S. (expected 2019)

Nathan Umbanhowar — Brown Math+CS B.Sc. (expected 2019)

	Daniel Murphy	Brown Applied Math+CS B.Sc. (expected 2019)
	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 *Next position:* **PhD Student, UC Berkeley**	Stanford CS BS 2015

FUNDING

NSF CRII #1753684 2018
Learning Procedural Modeling Programs for Computer Graphics from Examples

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

Program Committee Member
SIGGRAPH Asia: 2018
ICML: 2018

Conference Proceedings Reviewer
SIGGRAPH: 2016, 2017, 2018
SIGGRAPH Asia: 2016, 2017
UIST: 2016
NIPS: 2016
Eurographics: 2017, 2018
ICLR: 2018

Journal Reviewer
Computer Aided Design: 2016
IEEE TVCG: 2016
Computer Graphics Forum: 2017

Grant Reviewer
NSF Proposal Reviewer: 2018

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)