

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

Brown University Computer Science Department

Providence, RI

2017 – Present

Postdoctoral Researcher

Stanford University Computer Science Department

Stanford, CA

2016 – 2017

Research Intern

Adobe Creative Technologies Lab

San Francisco, CA

Summer 2011

Graduate Research Assistant

Stanford University Computer Science Department

Stanford, CA

2010 – 2016

Technical Director Intern

Pixar Animation Studios

Emeryville, CA

Summer 2009

Software Intern

Hewlett-Packard

Roseville, CA

Summer 2008

REFEREED PUBLICATIONS

PlanIT: Planning and Instantiating Indoor Scenes with Relation Graph and Spatial Prior Networks. Kai Wang, Yu-an Lin, Ben Weissmann, Manolis Savva, Angel X. Chang, Daniel Ritchie. *SIGGRAPH 2019*.

Fast and Flexible Indoor Scene Synthesis via Deep Convolutional Generative Models. Daniel Ritchie, Kai Wang, Yu-an Lin. *CVPR 2019*.

Learning to Describe Scenes with Programs. Yunchao Liu, Zheng Wu, Daniel Ritchie, William T. Freeman, Joshua B. Tenenbaum, Jiajun Wu. *ICLR 2019*.

Learning to Infer Graphics Programs from Hand-Drawn Images. Kevin Ellis, Daniel Ritchie, Armando Solar-Lezama, Joshua B. Tenenbaum. *NeurIPS 2018*. SPOTLIGHT PRESENTATION.

Improving Shape Deformation in Unsupervised Image-to-Image Translation Aaron Gokaslan, Vivek Ramanujan, Daniel Ritchie, Kwang In Kim, James Tompkin. *ECCV 2018*.

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, Jürgen Sturm, Matthias Nießner. *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**

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

**INVITED
TALKS**

Probabilistic Programming
Brown ICERM, *Computer Vision Semester Program* February 2019

Virtual Indoor Scene Synthesis: Past, Present, and Future
MIT, *Graphics Lunch* December 2018

Toward Style-Aware Generative Models of Virtual Indoor Scenes
Wayfair LLC, *Computer Vision / Data Science Team* December 2018

Visual Program Induction
Brown Applied Math, *Pattern Theory Seminar* November 2018

Probabilistic Programming for Computer Graphics
MIT, *PROBPROG 2018* October 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

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

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

Learning and Inferring Graphics Programs
MIT, *Vision Seminar* September 2017

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

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

PANELIST

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

**TUTORIALS &
WORKSHOPS**

3D Scene Generation June 2019
Angel Chang, Qixing Huang, Daniel Ritchie, Manolis Savva
CVPR 2019 Workshop

Learning Generative Models of 3D Structures May 2019
Siddhartha Chaudhuri, Daniel Ritchie, Kai Xu, Hao Zhang

Eurographics 2019 Tutorial

TEACHING

Instructor Fall 2018, Fall 2019
Brown CSCI 1470/2470: Deep Learning

Instructor Spring 2018, Spring 2019
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**

Theresa Barton Brown CS PhD (current)

Kai Wang Brown CS PhD (current)

Siqi Wang Brown CS ScM (expected 2020)

Ruolan Tang Brown CS ScM (expected 2019)

Yu-An (Andy) Lin Brown ECE ScM (expected 2018)

Michael Cosgrove Brown CS ScB (expected 2021)

Dylan Tian Brown CS ScB + Visual Art AB (expected 2021)

Brad Guesman Brown Physics ScB (expected 2020)

Brian Oppenheim Brown CS ScB (expected 2020)

Philip Xu Brown CS ScB (expected 2020)

Ben Weissmann Brown CS ScB (expected 2019)

Mae Heitmann Brown CS ScB (expected 2019)

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|--------------------------------|---|---|
| | Montana Fowler | Brown CS AB + Visual Art AB (expected 2019) |
| | Nathan Umbanhowar | Brown Math+CS ScB (expected 2019) |
| | Daniel Murphy | Brown Applied Math+CS ScB (expected 2019) |
| | Shreya Shankar | Stanford CS BS (expected 2019) |
| | Yifan Liu <i>Next position: Google</i> | Brown CS ScM 2018 |
| | Maxime Voisin <i>Next position: Research Assistant, Stanford University</i> | Stanford MS&E MS 2018 |
| | Anna Thomas <i>Next position: Masters Student, University of Cambridge (Churchill Scholar)</i> | Stanford CS BS 2018 |
| | Sarah Jobalia <i>Next position: Microsoft</i> | Stanford CS MS 2018 |
| | Ben Mildenhall <i>Next position: PhD Student, UC Berkeley</i> | Stanford CS BS 2015 |
| FUNDING | Brown University OVPR Research Seed Fund Award | 2019 |
| | Building a Large Dataset of Articulated 3D Object Models Sole PI, \$42,500 | |
| | NSF CRII #1753684 | 2018 |
| | Learning Procedural Modeling Programs for Computer Graphics from Examples Sole PI, \$175,000 | |
| 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 / Area Chair | |
| | SIGGRAPH Asia: 2018, 2019 NeurIPS: 2019 | |
| | Conference Proceedings Reviewer | |
| | SIGGRAPH: 2016, 2017, 2018, 2019 | |
| | SIGGRAPH Asia: 2016, 2017, 2018, 2019 | |
| | CVPR: 2019 | |
| | UIST: 2016 | |
| | NeurIPS: 2016, 2018, 2019 | |
| | Eurographics: 2017, 2018, 2019 | |
| | Graphics Interface: 2019 | |
| | ICCV: 2019 | |
| | ICML: 2018 | |
| | ICLR: 2018 | |

Journal Reviewer

Computer Aided Design: 2016

IEEE TVCG: 2016

Computer Graphics Forum: 2017

Grant Reviewer

NSF Proposal Reviewer: 2018

PATENTS

Methods and Apparatus for Comic Creation (US 20130073952 A1)