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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

Example-based Authoring of Procedural Modeling Programs with Struc-PUBLICATIONS tural and Continuous Variability Daniel Ritchie, Sarah Jobalia, Anna Thomas Eurographics 2018 (conditionally accepted).

> 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 Gradientbased 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

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

Assistant ProfessorProvidence, RIBrown University Computer Science Department2017 - Present

Postdoctoral ResearcherStanford, CAStanford University Computer Science Department2016 - 2017

Research Intern

Adobe Creative Technologies Lab

San Francisco, CA

Summer 2011

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

Technical Director InternEmeryville, CAPixar Animation StudiosSummer 2009

Software Intern	Roseville, CA
Hewlett-Packard	Summer 2008

TEACHING Instructor Spring 2018

Brown CS 2240: Interactive Computer Graphics

Instructor Fall 2017

Brown CS 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)

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 Stanford CS BS 2015

Next position: PhD Student, UC Berkeley

AWARDS & Eurographics Best Paper Honorable Mention 2015
HONORS Stanford Graduate Fellowship 2010
UC Berkeley EECS Departmental Citation 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

Computer Graphics Forum: 2017

Conference Proceedings Reviewer

SIGGRAPH: 2016, 2017 SIGGRAPH Asia: 2016, 2017

UIST: 2016 NIPS: 2016

Eurographics: 2017, 2018

ICLR: 2018

OPEN-SOURCE WebPPL

http://webppl.org

SOFTWARE 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)