

Mike Roberts

Computer Science Department, Stanford University
Room 398, 353 Serra Mall, Stanford, California, 94305-9025
+1 (650) 924 7168 / mlrobert@stanford.edu
<http://graphics.stanford.edu/~mlrobert>

RESEARCH INTERESTS

Using **robotics** to address problems in **computer graphics** and **computer vision**; motion planning, trajectory optimization, and control methods for robotics; software tools and algorithms for creativity support; reconstructing 3D scenes from images; continuous and discrete optimization; submodular optimization; programming the behavior of drone swarms; multi-agent path planning for construction and fabrication.

EDUCATION

Stanford University Stanford, California
Ph.D. Computer Science 2012–2018
Advisor: Pat Hanrahan
Dissertation: Trajectory Optimization Methods for Drone Cameras

Harvard University Cambridge, Massachusetts
Visiting Research Fellow Summer 2013
John A. Paulson School of Engineering and Applied Sciences
Advisor: Hanspeter Pfister

University of Calgary Calgary, Canada
M.S. Computer Science 2010

University of Calgary Calgary, Canada
B.S. Computer Science 2007

EMPLOYMENT

Microsoft Research Redmond, Washington
Research Intern Summer 2016, 2017
Advisors: Neel Joshi, Sudipta Sinha

Skydio Redwood City, California
Research Intern Spring 2016
Mentors: Adam Bry, Frank Dellaert

Udacity Mountain View, California
Course Developer, Introduction to Parallel Computing 2012–2013
Instructors: John Owens, David Luebke

Harvard University Cambridge, Massachusetts
Research Fellow, John A. Paulson School of Engineering and Applied Sciences 2010–2012
Advisor: Hanspeter Pfister

NVIDIA Austin, Texas
Developer Tools Programmer Intern Summer 2009

Radical Entertainment Vancouver, Canada
Graphics Programmer Intern 2005–2006

HONORS AND AWARDS

Featured in the Highlights of SIGGRAPH session at the FMX Festival 2017 2017
1% acceptance rate (3 / 467)

Invited speaker, TEDxBerkeley 2017 2017

Excellent reviewer, ACM Human Factors in Computing Systems (CHI) 2017 2017

Featured in the SIGGRAPH 2016 Technical Papers Trailer 2016
4% acceptance rate (19 / 467)

Featured in the SIGGRAPH Asia 2015 Technical Papers Trailer 2015
4% acceptance rate (11 / 302)

Front cover article, Cell 162(3) 2015

SELECTED PUBLICATIONS

My publications are also listed on [Google Scholar](#).

Submodular Trajectory Optimization for Aerial 3D Scanning

Mike Roberts, Debadeepta Dey, Anh Truong, Sudipta Sinha, Shital Shah, Ashish Kapoor, Pat Hanrahan, Neel Joshi

International Conference on Computer Vision (ICCV) 2017

Generating Dynamically Feasible Trajectories for Quadrotor Cameras

Mike Roberts, Pat Hanrahan

ACM Transactions on Graphics 35(4) (SIGGRAPH 2016)

Featured in the Highlights of SIGGRAPH session at the FMX Festival 2017

Featured in the SIGGRAPH 2016 Technical Papers Trailer

An Interactive Tool for Designing Quadrotor Camera Shots

Niels Joubert*, **Mike Roberts***, Anh Truong, Floraine Berthouzoz, Pat Hanrahan

ACM Transactions on Graphics 34(6) (SIGGRAPH Asia 2015), * Authors contributed equally

Featured in the SIGGRAPH Asia 2015 Technical Papers Trailer

Saturated Reconstruction of a Volume of Neocortex

Narayanan Kasthuri, Kenneth Jeffrey Hayworth, Daniel Raimund Berger, Richard Lee Schalek, Jose Angel Conchello, Seymour Knowles-Barley, Dongil Lee, Amelio Vazquez-Reina, Verena Kaynig, Thouis Raymond Jones, **Mike Roberts**, Josh Lyskowski Morgan, Juan Carlos Tapia, H. Sebastian Seung, William Gray Roncal, Joshua Tzvi Vogelstein, Randal Burns, Daniel Lewis Sussman, Carey Eldin Priebe, Hanspeter Pfister, Jeff William Lichtman

Cell 162(3), 2015

Front cover article

Large-Scale Automatic Reconstruction of Neuronal Processes from Electron Microscopy Images

Verena Kaynig, Amelio Vazquez-Reina, Seymour Knowles-Barley, **Mike Roberts**, Thouis R. Jones, Narayanan Kasthuri, Eric Miller, Jeff Lichtman, Hanspeter Pfister

Medical Image Analysis 22(1), 2015

Design and Evaluation of Interactive Proofreading Tools for Connectomics

Daniel Haehn, Seymour Knowles-Barley, **Mike Roberts**, Johanna Beyer, Narayanan Kasthuri, Jeff W. Lichtman, Hanspeter Pfister

IEEE Transactions on Visualization and Computer Graphics 20(12) (SciVis 2014)

Neural Process Reconstruction from Sparse User Scribbles

Mike Roberts, Won-Ki Jeong, Amelio Vazquez-Reina, Markus Unger, Horst Bischof, Jeff Lichtman, Hanspeter Pfister

Medical Image Computing and Computer Assisted Intervention (MICCAI) 2011

A Work-Efficient GPU Algorithm for Level Set Segmentation

Mike Roberts, Jeff Packer, Mario Costa Sousa, Joseph Ross Mitchell

High Performance Graphics 2010

SOFTWARE

Flashlight: A Python Library for Analyzing and Solving Quadrotor Control Problems

<http://mikeroberts3000.github.io/flashlight>

INVITED TALKS

Trajectory Optimization Methods for Drone Cameras

Oculus Research

June 2018

Snapchat Research

May 2018

Carnegie Mellon University

Boston University	March 2018
Google Research	
Adobe Research	
Toyota Technological Institute at Chicago	
NVIDIA Research	February 2018
Simon Fraser University	
Harnessing the Creative Power of Drones	
Charles University in Prague	November 2017
Hacker Connect Conference 2017, opening keynote	August 2017
Google	June 2017
University College London	May 2017
Disney Research	
ETH Zurich	
University of Oxford	
Max Planck Institute for Informatics	
University of California, Berkeley	April 2017
Samsung	
TEDxBerkeley 2017	
Autel Robotics	March 2017
3D Robotics	
University of California, Berkeley	February 2017
Columbia University	November 2016
Yale University	
Princeton University	
Brown University	
Intel	October 2016
Generating Dynamically Feasible Trajectories for Quadrotor Cameras	
FMX Festival 2017, Highlights of SIGGRAPH session	May 2017
Adobe Research	September 2016
Apple	August 2016
Massachusetts Institute of Technology	
Skydio	February 2016
Cape Productions	
3D Robotics	January 2016
TEACHING EXPERIENCE	
Udacity	2013–
Course Developer, Introduction to Parallel Programming	
<i>Instructors: John Owens, David Luebke</i>	
<i>Ongoing since 2013, over 80,000 students enrolled</i>	
Stanford University	Spring 2018
Course Assistant, Convolutional Neural Networks for Visual Recognition	
<i>Instructors: Fei-Fei Li, Justin Johnson, Serena Yeung</i>	
Stanford University	Winter 2018
Course Assistant, Mathematical Methods for Robotics, Vision, and Graphics	
<i>Instructor: Doug James</i>	
Massachusetts Institute of Technology	Summer 2016
Guest Lecturer, Advances in Imaging	
<i>Instructor: Ramesh Raskar</i>	
Harvard University	Fall 2013
Course Contributor, Data Science	
<i>Instructors: Hanspeter Pfister, Joe Blitzstein</i>	
<i>Contributed lecture notes to the initial offering of Harvard's Data Science course in Fall 2013</i>	

Harvard University Teaching Fellow, Visualization <i>Instructor: Hanspeter Pfister</i>	Winter 2012
Harvard University Teaching Fellow, Computing Foundations for Computational Science <i>Instructor: Hanspeter Pfister</i>	Fall 2011
Harvard University Teaching Fellow, Massively Parallel Computing <i>Instructors: Hanspeter Pfister, Nicolas Pinto</i>	Winter 2011
University of Calgary Guest Lecturer, Video Game Programming	Winter 2006, 2007, 2008

**REVIEWING
EXPERIENCE**

Conference
 SIGGRAPH (2016, 2017, 2018)
 Computer Vision and Pattern Recognition (CVPR) (2018)
 Human Factors in Computing Systems (CHI) (2016, received excellent reviewer award in 2017, 2018)
 International Conference on 3D Vision (3DV) (2017, 2018)
 International Conference on Robotics and Automation (ICRA) (2017, 2018)
 Human Robot Interaction (2018)
 High Performance Graphics (2012)
 Workshop on General Purpose Computing on Graphics Processing Units (2011, 2012)

Journal
 ACM Transactions on Graphics (2016, 2017, 2018)
 IEEE Transactions on Visualization and Computer Graphics (2013, 2018)
 IEEE Signal Processing Magazine (2018)
 IEEE Transactions on Medical Imaging (2016)

GAME CREDITS

Prototype (PC, Playstation 3, and Xbox 360) <i>Radical Entertainment, Activision</i>	2009
Scarface: The World Is Yours (PC, Wii, Xbox, and Playstation 2) <i>Radical Entertainment, Sierra</i>	2006

PRESS COVERAGE

New App Lets Drone Pilots Customize Flight Path and Camera Movement Before Takeoff
Digital Trends (October 19th, 2015)

Researchers Create Software for Designing Pro Drone Shots in a Virtual World
Petapixel (October 16th, 2015)

Interactive Drone App Lets You Capture Aerial Shots Like a Pro
Engadget (October 15th, 2015)

These Stunning Images Will Take You on a Journey Through the Brain
Huffington Post (August 4th, 2015)

3D Color Images of the Brain Reveal its Glorious Unseen Detail
Popular Science (July 31st, 2015)

3D Brain Map Reveals Connections Between Cells in Nano-Scale
The Guardian (July 30, 2015)

Crumb of Mouse Brain Reconstructed in Full Detail
Nature News (July 30, 2015)

A Voyage into the Brain
National Geographic (February 2014)

What Makes Us Human?
BBC Horizon (July 3rd, 2013)

In Pursuit of a Mind Map, Slice by Slice
New York Times (December 27th, 2010)

REFERENCES

Pat Hanrahan

CANON USA Professor of Computer Science and Electrical Engineering, Stanford University
hanrahan@cs.stanford.edu

Doug James

Professor of Computer Science, Stanford University
djames@cs.stanford.edu

Hanspeter Pfister

An Wang Professor of Computer Science, Harvard University
pfister@seas.harvard.edu

Adam Finkelstein

Professor of Computer Science, Princeton University
af@cs.princeton.edu

John Owens

Child Family Professor of Engineering and Entrepreneurship, University of California, Davis
jowens@ece.ucdavis.edu

Sudipta Sinha

Researcher, Microsoft Research
sudipta.sinha@microsoft.com