

David F. Fouhey

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Affiliation

University of Michigan

Assistant Professor, Computer Science and Engineering

January 2019 – current

Affiliate Assistant Professor, Robotics Institute

January 2019 – current

Education

Carnegie Mellon University, The Robotics Institute, Pittsburgh, PA **September 2011 – August 2016**

Ph.D., Robotics

Advisors: Abhinav Gupta, Martial Hebert

Middlebury College, Middlebury, VT

September 2007 – May 2011

A.B., Computer Science, *Summa Cum Laude*

Highest Honors in Computer Science; minor in Mathematics

Academic Positions

INRIA Paris, Willow Laboratory

September 2018 – November 2018

Visiting Professor (Hosts: Josef Sivic, Ivan Laptev)

University of California, Berkeley

September 2016 – August 2018

Postdoc (Mentors: Alexei A. Efros, Jitendra Malik)

Oxford University

Summer 2015

Visitor (Host: Andrew Zisserman)

Microsoft Research

Summer 2013

Intern (Supervisor: Larry Zitnick)

CMU-National Robotics Engineering Center

Summer 2010, Spring 2011

Intern (Supervisor: Cristian Dima)

Middlebury College

2008–2011

Research Assistant (Supervisors: Daniel Scharstein, Amy Briggs)

Selected Awards and Honors

Outstanding Reviewer Award CVPR 2018

ICCV 2015 Doctoral Consortium, Selected for Travel Grant

NDSEG Fellowship (2013 - 2016)

NSF Graduate Research Fellowship (2011 - 2013)

Elected to Phi Beta Kappa, awarded Phi Beta Kappa Prize at Middlebury College
(awarded to one student per year in a class of ≈ 625)

Timothy Huang Senior Award for Academic Excellence, CS Department, Middlebury College

Barry M. Goldwater Scholar (2010 - 2011)

Talks

Understanding How To Go Places and Do Things

GRASP Lab, University of Pennsylvania, March 2019

Michigan State University, March 2019

AIA/HMI ML Data Set and AIA to EVE by Deep Learning

Solar Dynamics Observatory Meeting: SDO in the Age of Deep Learning Mini-Workshop Session,
November 2018

Understanding How to Go Places and Do Things

Oxford University, November 2018

Czech Technical University in Prague, October 2018

Recovering a Functional and Three Dimensional Understanding of Images

Ecole des Ponts ParisTech, IMAGINE, October 2018

INRIA Rhône-Alpes, September 2018

INRIA Paris, September 2018

University of Michigan, April 2018

University of North Carolina, March 2018

CMU, March 2018

UC Irvine, February 2018

Simon Fraser University, February 2018

UC Berkeley BAIR Seminar, January 2018 [Watch here](#)

Predicting Voxel-based Reconstructions of Objects

3rd International Workshop on Recovering 6D Object Pose at ICCV 2017, October 2017

Adventures in 3D and Functional Understanding

UC Berkeley, September 2016

3D Shape Attributes

CVPR, June 2016 [Watch here](#)

Towards a Physical and Human-Centric Understanding of Images

MIT CSAIL, June 2016

UCLA, May 2016

USC CS Colloquium, March 2016

UT Austin UTCS Colloquium, March 2016
 CMU VASC Seminar, March 2016
 UC Berkeley, February 2016
 Google, ML Seminar, February 2016
 Intel Visual Computing Lab, February 2016

Revisiting Qualitative Shape via 3D Shape Attributes
 Object Understanding for Interaction Workshop at ICCV 2015, December 2015

Cues and Constraints for 3D Scene Interpretation
 University College London, July 2015
 University of Edinburgh, IPAB Seminar, July 2015
 University of Oxford, Robotics Seminar, July 2015
 University of Surrey, CVSSP Seminar, June 2015

Unfolding an Indoor Origami World
 ECCV, September 2014 [Watch here](#)
 CMU VASC Seminar, September 2014

Data-Driven 3D
 Tutorial on 3D Scene Understanding, ECCV 2014

Mid-level Likelihoods and Constraints for 3D Scene Interpretation
 Robert Bosch Research and Technology Center, June 2014;
 Microsoft Research Cambridge, May 2014
 University of Oxford, Robotics Seminar, May 2014

Data-Driven 3D Primitives for Single Image Understanding.
 CMU VASC Seminar, November 2013

People Watching: Human Actions as a Cue for Single View Geometry.
 ECCV, October 2012. [Watch here](#)
 CMU VASC Seminar, September 2012

Mentorship

MS Mentees:

Zhaoheng Zheng, UM ECE MS	(Jan 2019-)
Dandan Shan, UM ECE MS	(Jan 2019-)
Vihang Agarwal, UM ECE MS, Independent Study	(Jan 2019-)
Chockalingam Ravi Sundaram, UM ECE MS, Independent Study	(Jan 2019-)

Thesis committee member:

David Dang University of Michigan Aerospace Engineering PhD, <i>Advisor</i> : Iain Boyd	TBD
Dejiao Zhang University of Michigan EECS PhD, <i>Advisor</i> : Laura Balzano	TBD
Luowei Zhou University of Michigan EECS PhD, <i>Advisor</i> : Jason Corso	TBD

Dawei Yang University of Michigan EECS PhD, <i>Advisor: Jia Deng</i>	TBD
Weifeng Chen University of Michigan EECS PhD, <i>Advisor: Jia Deng</i>	TBD

Past or external mentorship (student co-authors or equivalent effort):

Olivia Wiles, University of Oxford	Jan 2019-
Dimitri Zhukov, INRIA	Sep 2018-Nov 2018
Ashish Kumar, UC Berkeley	Nov 2017-May 2018
Weicheng Kuo, UC Berkeley	Jan 2017 - Nov 2017
Xiaolong Wang, CMU	Sep 2014-May 2015
Rohit Girdhar, CMU	Sep 2014-May 2016
Adrien Matricon, Visitor to CMU before joining ENSTA	May-Nov 2014

Funding

Nokia <i>(Donation) Fine-Grained Human Hands In Contact</i> PI. Total: \$39,000	2019
P&G <i>Analyzing the Relation between Product Features and Consumer Preferences</i> Co-PI. My portion: \$137,206; Total: \$569,957 (PI: Danai Koutra; co-PI: Rada Mihalcea)	Jan 2019-Dec 2020
Toyota Research Institute <i>Building and Reasoning about Fully 3D Representations</i> PI. Total: \$453,280	Jan 2019-Dec 2020

Service

Conference Area Chair/Senior Program Committee:
CVPR 2019

Workshops and Tutorials:

Organizer, [Bridges to 3D Workshop](#), CVPR 2018
Organizer, [Bridges to 3D Workshop](#), CVPR 2017
Organizer, [Tutorial on 3D Scene Understanding](#), ECCV 2014

Program Committee:

Workshop on 3D Reconstruction in the Wild, ECCV 2018
Workshop on Anticipating Human Behavior, ECCV 2018
Workshop on Affordances in Vision for Cognitive Robotics, RSS 2014
Workshop on Visual Perception of Object and Scene Affordances, ECCV 2014

Reviewer (Selected):

ECCV 2014–, CVPR 2015–, ICCV 2015–, BMVC 2017–, 3DV 2017–, NIPS 2018–, IJCV, TPAMI, CVIU, TIP.

Department Service

University of Michigan

CSE Graduate Admissions Committee

AY2018-2019

Past Service:

UC Berkeley: Ph.D. Admissions Committee 2017

CMU:

Ph.D. Admissions Committee 2014, 2015

Master's Thesis Committee Member: Maheen Rashid, Zhizhong Li, Meng Song, Aaron Walsman, Rohit Girdhar, Mengtian Li, Lerrel Pinto.

Ph.D. Research Qualifier Committee Member: Jacob Walker, Allison Del Giorno.

Teaching Experience

University of Michigan

EECS 442: Computer Vision
152 Students

Winter 2019

Past teaching

AI Mentor: NASA Frontier Development Lab (Summer 2018) – mentoring researchers with a background in astrophysics on deep learning for solar weather analysis. Resulted in 2 paper submissions lead by students.

Co-Instructor: Visual Object and Activity Recognition, UC Berkeley, CS 294-43, Spring 2017, Fall 2017, Spring 2018.

Co-Instructor: Visual Learning and Recognition, Carnegie Mellon University 16-824, Spring 2016.

Guest Lecturer: Image Manipulation & Computational Photography, UC Berkeley CS194-26, Fall 2016; Visual Learning and Recognition CMU 16-824, Spring 2015; Visual Recognition, U. Pittsburgh 3710, Spring 2015; Computational Photography, CMU 15-463, Fall 2014.

TA: Computer Vision, Carnegie Mellon University 16-720, Fall 2012.

Publications

R. Galvez, **D.F. Fouhey**, M. Jin, A. Szenicer, A. Muñoz-Jaramillo, M.C.M. Cheung, P.J. Wright, M.G. Bobra, Y. Liu, J. Mason, R. Thomas.

A Machine Learning Dataset Prepared From the NASA Solar Dynamics Observatory Mission
Accepted in The Astrophysical Journal Supplement, 2019

D. Zhukov, J.-B. Alayrac, G. Cinbis, **D.F. Fouhey**, I. Laptev, J. Sivic
Cross-task weakly-supervised learning from instructional videos
CVPR 2019.

A. Kumar, S. Gupta, **D.F. Fouhey**, S. Levine, J. Malik.
Visual Memory for Robust Path Following.
NIPS 2018.
(Oral)

D.F. Fouhey, W. Kuo, A.A. Efros, J. Malik.
From Lifestyle Vlogs to Everyday Interactions.
CVPR 2018.

S. Tulsiani, S. Gupta, **D.F. Fouhey**, A.A. Efros, J. Malik
Factoring Shape, Pose, and Layout from the 2D Image of a 3D Scene.
CVPR 2018.

M. Lescroart, **D.F. Fouhey**, J. Malik
Convolutional neural networks represent shape dimensions – but not as accurately as humans
Abstract at VSS 2018
Note: an extended abstract, not full peer-reviewed paper

D.F. Fouhey, A. Gupta, A. Zisserman.
From Images to 3D Shape Attributes.
To appear in Transactions on Pattern Analysis and Machine Intelligence.

R. Girdhar, **D.F. Fouhey**, M. Rodriguez, A. Gupta.
Learning a Predictable and Generative Vector Representation for Objects.
At the 14th European Conference on Computer Vision (ECCV 2016).
(Spotlight: 2.9% Acceptance Rate)

D.F. Fouhey, A. Gupta, A. Zisserman.
3D Shape Attributes.
At the 29th Conference on Computer Vision and Pattern Recognition (CVPR 2016).
(Oral: 3.9% acceptance rate)

R. Girdhar, **D.F. Fouhey**, A. Gupta, K. Kitani, A. Gupta, M. Hebert.
Cutting through the Clutter: Task-Relevant Features for Image Matching.
At the Winter Conference on Applications of Computer Vision (WACV) 2016

D.F. Fouhey, W. Hussain, A. Gupta, M. Hebert.
Single Image 3D Without a Single 3D Image.
At the 15th International Conference on Computer Vision (ICCV 2015).

X. Wang, **D.F. Fouhey**, A. Gupta.
Designing Deep Networks for Surface Normal Estimation.
At the 28th Conference on Computer Vision and Pattern Recognition (CVPR 2015).

D.F. Fouhey, A. Gupta, M. Hebert.
Unfolding an Indoor Origami World.
At the 13th European Conference on Computer Vision (ECCV 2014).
(Oral: 2.6% acceptance rate)

D.F. Fouhey, C. L. Zitnick.
Predicting Object Dynamics in Scenes.
At the 27th Conference on Computer Vision and Pattern Recognition (CVPR 2014).

D.F. Fouhey, V. Delaitre, A. Gupta, A. Efros, I. Laptev, and J. Sivic.
People Watching: Human Actions as a Cue for Single View Geometry.
In *International Journal of Computer Vision (IJCV)*, Volume 110, Issue 3, pp 259-274, December 2014.

D.F. Fouhey, A. Gupta, M. Hebert.

Data-Driven 3D Primitives for Single-View Scene Understanding.

At 14th International Conference on Computer Vision (ICCV 2013).

D.F. Fouhey, V. Delaitre, A. Gupta, A. Efros, I. Laptev, and J. Sivic.

People Watching: Human Actions as a Cue for Single View Geometry.

At the 12th European Conference on Computer Vision (ECCV 2012).

(Oral: 2.8% acceptance rate – Invited to IJCV special issue on ECCV 2012)

V. Delaitre, **D.F. Fouhey**, I. Laptev, J. Sivic, A. Gupta, and A.A. Efros.

Scene semantics from long-term observation of people.

At the 12th European Conference on Computer Vision (ECCV 2012).

D.F. Fouhey, A. Collet, M. Hebert, and S. Srinivasa.

Object Recognition Robust to Imperfect Depth Data.

At the 2nd Workshop on Consumer Depth Cameras for Computer Vision in conjunction with ECCV 2012.

Note: a lightly reviewed paper

M. Costanza-Robinson, B. Estabrook, and **D.F. Fouhey.**

Representative elementary volume estimation for porosity, moisture saturation, and air-water interfacial areas in unsaturated porous media: Data quality implications.

In *Water Resources Research* 2011, 47, W07513, doi:10.1029/2010WR009655.

D.F. Fouhey, D. Scharstein, and A. Briggs.

Multiple Plane Detection in Image Pairs Using J-linkage.

At the 20th International Conference on Pattern Recognition (ICPR 2010).