David F. Fouhey

Email: fouhey@umich.edu
Homepage: Here
Google scholar: Here

Affiliation

Assistant Professor, New York University   September 2023 onwards

Computer Science, Courant Institute of Mathematical Sciences
Electrical & Computer Engineering, Tandon School of Engineering

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

University of Michigan   January 2019 – August 2023
Assistant Professor, EECS (Computer Science & Engineering Division)

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

University of Michigan EECS Outstanding Achievement Award (awarded to ≈ two faculty a year in CSE): *for contributions to computer vision research and education, and support of the CSE graduate student community*

NSF CAREER, 2022

Outstanding Reviewer Award: CVPR 2018, NeurIPS 2019, ICCV 2019, ECCV 2020

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)

Students / Mentorship

PhD Students:

Shengyi Qian, UM CSE PhD	(Sep 2019 –)
Nilesh Kulkarni, UM CSE PhD, *Co-supervised with Justin Johnson*	(Sep 2019 –)
Richard Higgins, UM CSE PhD	(May 2019 –)
Dandan Shan, UM CSE PhD *Rackham International Student Fellowship*	(May 2020 –)
Chris Rockwell, UM CSE PhD, *Co-supervised with Justin Johnson*	(May 2020 –)
Sarah Jabbour, UM CSE PhD, *Co-supervised with Jenna Wiens*	(May 2020 –)
Linyi Jin, UM CSE PhD	(May 2021 –)

Previous PhD Student Collaborators:

Elizabeth Olson, UM Robotics PhD Collaborator *Next Position: PhD Student, UM Robotics with Chad Jenkins*	(May 2019 – August 2020)
Mohamed El Banani, UM CSE PhD Collaborator *Next Position: PhD Student, UM CSE with Justin Johnson*	(May 2019 – Nov 2019)

MS Students/Visitors to My Group:

Currently: None

MS Student Alumni:

Yinwei Dai, UM CSE MS *Next Position: PhD Student, Princeton CS*	(May 2020 – Decebmer 2021)

Linyi Jin, UM Robotics MS   (May 2019 – May 2021)
Next Position: PhD Student, UM CSE with me

Dandan Shan, UM ECE MS   (Jan 2019 – May 2020)
Next Position: PhD Student, UM CSE with me

Christopher Rockwell, UM CSE MS   (May 2019 – May 2020)
Next Position: PhD student, UM CSE with me, Justin Johnson

Michelle Shu, Visitor from JHU post-BS, pre-MS   (May 2019 – August 2019)
Next Position: PhD student, Cornell CS

Zhaoheng Zheng, UM ECE MS   (Jan 2019 – May 2019)
Next Position: PhD Student, USC CS

Vihang Agarwal, UM ECE MS, Independent Study   (Jan 2019 – Dec 2019)
Next Position: Research Assistant, UM Medicine

Chockalingam Ravi Sundaram, UM ECE MS, Independent Study   (Jan 2019 – May 2019)
Next Position: R&D Research Engineer, PlayStation

Undergraduate Students:

Matthew Sticha, UM CS BS   (May 2022 –)

Undergraduate Student Alumni:

Ruoyu Wang, UM CS Physics BS   (May 2022 – present)
Next Position: PhD Student, NYU CS

Tianyi Cheng, UM CS BS   (May 2022 – June 2023)
Next Position: MS Student, CMU

Ayda Sultan, Addis Ababa Institute of Technology   (May 2022 – June 2023)

Simon Rusekeza, University of Rwanda   (May 2022 – August 2022)

Dichang Zhang, UM Data Science BSE   (Jan 2020 – May 2022)
Next Position: PhD Student, Stonybrook University CS

Siyi Chen, UM CSE BSE   (May 2021 – May 2022)
Next Position: PhD Student, UM ECE

Samir Agarwala, UM CSE BSE   (May 2021 – May 2022)
Next Position: MS Student, Stanford CS

Ruiyu Li, UM CSE BSE   (May 2021 – December 2021)
Next Position: MS Student, TBD

Mahlet Haile, Addis Ababa University Software Eng. BS   (May 2021 – September 2021)

Tibebu Wassie, Addis Ababa University Software Eng. BS   (May 2021 – September 2021)

Zhizhuo Zhou, UM CSE BSE   (May 2020 – August 2021)
NSF Graduate Fellowship Winner
Next Position: MS Student, CMU Robotics

Gemmechu Mohammed, Addis Ababa University, BS   (May 2020 – August 2021)
Next Position: PhD Student, Cornell University

Alexander Raistrick, UM CSE BSE   (May 2020 – May 2021)
Next Position: PhD Student, Princeton CS

Xiao Song, UM CSE BSE (May 2020 – August 2020)

Justin Bi, UM CSE BSE (May 2020 – July 2020)

Yige Kristina Liu, UM CSE BSE (Sep 2019 – May 2020)
Next Position: MS Student, Stanford CS

Sarah Jabbour, UM CSE BSE (June 2019 – May 2020)
Next Position: PhD Student, UM CSE with me, Jenna Wiens

Jiaqi Geng, UM CSE BSE / SURE Program (Feb 2019 – August 2020)
Next Position: MS Student, CMU Robotics

Max Hamilton, UM CSE BSE / SURE Program (May 2019 – May 2021)
Next Position: MS Student, UM CSE

Zhengyuan Dong, UM CSE BSE (May 2019 – May 2020)

Qichen Fu, UM CSE BSE (May 2019 – June 2020)
Next Position: MS Student, CMU Robotics

Yue Wu, UM CSE BSE (May 2019 – Dec 2019)

High School Students:

Adam Sun, Detroit Country Day School (June 2020 – August 2020)
Next Position: Undergrad at Stanford University

PhD Thesis committee member and defense date:

Minghan Zhu, UM ME *Advisor: Maani Ghaffari* TBD

Fahad Kamran, UM CSE *Advisor: Jenna Weins* TBD

Wenjia He, UM CSE *Advisor: Mike Cafarella* TBD

Won Park, UM CSE, *Advisor: Z. Morley Mao* March 2023

Madan Ravi Ganesh, UM ECE, *Advisor: Jason Corso, Salimeh Yasaei Sekh* July 2022

Oana Ignat, UM CSE, *Advisor: Rada Mihalcea* July 2022

Cameron Blocker, UM ECE, *Advisor: Jeff Fessler* July 2022

Megan Shearer, UM CSE, *Advisor: Michael Wellman* July 2022

Manikandasriram S.R., UM Robotics, *Advisor: Matthew Johnson-Roberson* June 2022

Shouchang Guo, UM ECE, *Advisor: Jeff Fessler* April 2022

Jiaxuan Wang, UM CSE, *Advisor: Jenna Wiens* Feb 2022

Brad Saund, UM Robotics, *Advisor: Dmitry Berenson* July 2021

Zheming Zhou, UM Robotics, *Advisor: Odest Chadwicke Jenkins* April 2021

Amy Nesky, UM CSE, *Advisor: Quentin Stout* August 2020

Dawei Yang, UM CSE, *Advisor: Jia Deng* June 2020
Note: I was the advisor of record for administrative reasons, but my actual role was a committee member

Kibok Lee, UM CSE, *Advisor: Honglak Lee* June 2020

Weifeng Chen, UM CSE, *Advisor: Jia Deng* June 2020
Note: I was the advisor of record for administrative reasons, but my actual role was a committee member

Chaowei Xiao, UM CSE, *Advisor: Mingyan Liu* June 2020

Luowei Zhou, UM Robotics, *Advisor: Jason Corso* March 2020

Dejiao Zhang, UM ECE, *Advisor: Laura Balzano* May 2019

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

Olivia Wiles, University of Oxford Jan 2019 – May2019
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 PhD May 2014 – Nov 2014

Funding

Personal share of external sponsored research funding: $3,535,896

Externally Sponsored Research Funding:

National Aeronautics and Space Administration (NASA) March 2022 – February 2023
Faster, Better, Deeper: Utilizing Deep Learning to Produce Enhanced Near Real Time Inversions from HMI Data for Space-Weather Modeling
(co-I; PI: Graham Barnes, NWRA) My portion awarded: $91,564; Total awarded:/$189,915

National Science Foundation January 2022 – December 2026
CAREER: Learning to Perceive the Interactive 3D World from an Image
(PI: Fouhey) My/Total Awarded: $584,449

NIH National Heart, Lung and Blood Institute September 2021 - August 2025
Human-AI Collaborations to Improve Accuracy and Mitigate Bias in Acute Dyspnea Diagnosis
(co-I; PIs: Jenna Wiens, Michael Sjoding UM). My portion awarded: $563,255; Total Awarded: $3,768,329

National Science Foundation October 2020 - October 2023
RI: Small: Understanding Hand Interaction In The Jumble of Internet Videos
(PI: Fouhey) My/Total Awarded: $436,971.

Toyota Research Institute April 2021 - March 2024
Low-Cost 3D Perception for Mobile Manipulation in Unstructured Human Environments
(co-PI; PI: Brent Griffin, UM) My portion budgeted: $422,891. Total budgeted: $1,851,143.

National Aeronautics and Space Administration (NASA) January 2020 - December 2021
Solar Storms and Terrestrial Impacts Center (SOLSTICE)
(co-I; PI: Tamas Gombosi, UM). My portion awarded: $61,374. Total budgeted: $1,302,162.

Lockheed Martin Advanced Technology Center (Prime Sponsor: NASA) September 2019 – 2021
Implementation of Phase E for the Atmospheric Imaging Assembly (AIA) Investigation on the SDO Mission
(PI: Fouhey) My/Total awarded: $24,906.

Defence Advanced Research Projects Agency (DARPA) MCS Program July 2019 – July 2022
MESS: Model-Building, Exploratory, Social System
(co-PI; PI: Alexei Efros, UC Berkeley). My portion awarded: $760,000; Total awarded: $9,477,951.

Procter & Gamble Company Jan 2019 – Dec 2020
Analyzing the Relation between Product Features and Consumer Preferences
(co-PI; PI: Danai Koutra, UM). My portion awarded: $137,206; Total awarded: $569,957.

Toyota Research Institute Jan 2019 – Dec 2020
Building and Reasoning about Fully 3D Representations
(PI: Fouhey) My/Total portion awarded: $453,280.

Internally Sponsored (but Competitively Selected) Research Funding:

Michigan Institute for Data Science: Propelling Original Data Science January 2020 - December 2020
Fusing Physics and Deep Learning for Solar Dynamics Forecasting
(PI: Fouhey). My/Total Awarded: $90,000 (minus $5,000 cost share).

Michigan Precision Health Investigators Awards January 2020 - December 2021
Precision diagnosis in patients with acute dyspnea by linking imaging and clinical data
(co-PI; PI: Michael Sjoding). My portion Awarded: $\approx$$100,000; Total Awarded: $299,095.

Gift Funding:

Adobe Inc 2021, 2022
Unrestricted Donation
Total: $28,000 (in three donations)

Procter & Gamble Company 2021
EPIC-Kitchens-100 Segmentation Project
(Donation to U. Bristol for UM, U. Bristol, U.Toronto Partnership) Total: $50,000

Nokia Networks Oy 2019
(Fine-Grained Human Hands In Contact)
Total: $38,273.

Community Service

Editing

Action Editor TMLR, March 2022 –

Conference Area Chair/Senior Program Committee:

(2023) CVPR, ICCV, WACV, NeurIPS; (2022) CVPR, ECCV, NeurIPS; (2021): ICLR, CVPR, NeurIPS, BMVC; (2020) CVPR, NeurIPS; (2019) CVPR

Conference Organizing Participation:

Reviewer for ICCV 2021 Workshops

Workshops and Tutorials:

Organizer, Joint International 3rd Ego4D and 11th EPIC Workshop, CVPR 2023
Organizer, 4D Hand Object Interaction Workshop, CVPR 2023
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–, NeurIPS 2018–, IJCV, TPAMI, The Astrophysical Journal, BMVC 2017–2018, 3DV 2017, CVIU, TIP.

Panels:

Presented on Machine Learning and Validation at National Academies of Sciences, Engineering, and Medicine for the *Space Weather Operations and Research Infrastructure Workshop, Phase II*

NSF (3x 2020), (1x 2021, 1 ad-hoc 2021), (1x 2022, 1 ad-hoc 2022)

Department & University Service

University of Michigan

Instructor, Intro to Grad Research	AY2022-2023
Faculty Advisor, Computer Science & Engineering Graduate Students	
AI in Science Postdoctoral Fellowship Program, Curriculum Committee	
Instructor, Intro to Grad Studies	AY2021–2022
CSE NSF Fellowship Coach	
Faculty Advisor, Computer Science & Engineering Graduate Students	
CSE Diversity Committee	AY2020–2021
CSE NSF Fellowship Coach	
Organized purchase of 160 GPU cluster worth $\sim$800K by 8 UM Faculty + University	
CSE Hosting Committee	AY2019–2020
CSE NSF Fellowship Coach (Annual CSE NSFGRF win rate increased 2.67 $\rightarrow$ 7)	
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.

Miscellaneous Activities

Consultant, Nokia Bell Labs, Sunnyvale	Summer 2018 – May 2020

Consultant, Computer Vision and Machine Learning

AI Mentor, NASA Frontier Development Lab	May 2018 – January 2019

Mentored researchers with a background in physics on deep learning for solar weather analysis. Resulted in 2 journal papers lead by mentees.

Outreach, DEI, Public Interest Activities

Michigan Innocence Clinic   Fall 2019, then intermittently
Measured height of a person in a video in Fall 2019 in relation to a possible wrongful conviction. The clinic took on the person's case. This evidence was critical to an exoneration of a man wrongfully convicted of first degree murder who was serving a life sentence without the possibility of parole.

Director, AI4ALL UMich   July 2019 –
Two week residential summer program to give an entry point to artificial intelligence, computer science and engineering to ≈25 high schoolers per year, with a particular focus on encouraging participation from groups that have been underrepresented historically in computer science. This program has run annually since Summer 2019 and has reached 100 students.

University of Michigan Departmental DEI Work:

Instructor of Record for Intro to CSE Graduate Studies   Fall 2020, 2021, 2022

Faculty Coordinator for Lab Culture Committee   May – Sep 2020

Miscellaneous Outreach:

CVPR 2021, 2022 Mentor ("tips for a successful PhD", etc.)

AI4All Curriculum Advisory Board, 2021

Panelist for webinar on AI for high schoolers via AI4All (December 2019, June 2020)

Participant, NextProf Pathfinder Workshop networking session (September 2019)

Teaching Experience

University of Michigan
I have included end-of-term evaluation scores for: Q1: Overall, this was an excellent course; Q2: Overall, the instructor was an excellent teacher.

EECS 442: Computer Vision   Winter 2023
262 student; Q1: 4.8; Q2: 4.8

EECS 442: Computer Vision   Winter 2022
300 students; Q1: 4.7; Q2: 4.8

EECS 542: Advanced Topics in Computer Vision   Fall 2021
53 students; Q1: 4.9, Q2: 4.9

EECS 442: Computer Vision *co-taught with Justin Johnson*   Winter 2021
329 students; Q1: 4.8, Q2: 4.8

EECS 542: Advanced Topics in Computer Vision   Fall 2020
50 students; Q1: 4.9, Q2: 5.0

EECS 598-007: The Ecological Approach to Visual Perception   Winter 2020
31 students; Q1: 4.9, Q2: 5.0

EECS 442: Computer Vision   Fall 2019
155 students; Q1: 4.8, Q2: 4.8

EECS 442: Computer Vision   Winter 2019
152 students; Q1: 4.6, Q2: 4.7

Past teaching

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

Computer vision and machine learning conferences are rigorously blind peer reviewed and typically have an acceptance rate of $\sim 20 - 30\%$. Oral/spotlight presentations typically have low-single digit acceptance rates (e.g., $3 - 4\%$). I have made an effort to indicate work that is not as throughly peer reviewed (e.g., an extended abstract or workshop paper). I have also provided context (e.g., impact factors, acceptance rates, author orders) for venues that are not vision or learning venues.

Key: * indicates equal contributions; *Blue and italics* indicate a graduate student of mine; *Red and italics* indicates an undergraduate (not yet matriculated to a graduate program) student of mine.

2023:

Linyi Jin, *Matthew Sticha*, Jianming Zhang, Yannick Hold-Geoffroy, Oliver Wang, Kevin Matzen, **David F. Fouhey**
Perspective Fields for Single Image View Calibration
At 36th Conference on Computer Vision and Pattern Recognition (CVPR 2023)

Richard E.L. Higgins, **David F. Fouhey**.
MOVES: Moving Objects in Video Enables Segmentation
At 36th Conference on Computer Vision and Pattern Recognition (CVPR 2023)

Nilesh Kulkarni, *Linyi Jin*, Justin Johnson, **David F. Fouhey**.
Learning to Predict Scene-Level Implicit 3D from Posed RGBD Data.
At 36th Conference on Computer Vision and Pattern Recognition (CVPR 2023)

David Fouhey, *Richard E.L. Higgins*, Spiro Antiochos, Graham Barnes, Marc L. DeRosa, Jon Todd Hoeksema, K.D. Leka, Yang Liu, Peter W. Schuck, Tamas I. Gombosi.
Large-Scale Spatial Cross-Calibration of Hinode/SOT-SP and SDO/HMI
The Astrophysical Journal Supplement Series, 264:49

2022:

Ahmad Darkhalil*, *Dandan Shan**, Bin Zhu*, Jian Ma*, Amlan Kar, *Richard E.L. Higgins*, Sanja Fidler, **David F. Fouhey**, Dima Damen.
EPIC-KITCHENS VISOR Benchmark: VIdeo Segmentations and Object Relations
NeurIPS, Datasets and Benchmarks Track, 2022

Chris Rockwell, Justin Johnson, **David F. Fouhey**.
The 8-Point Algorithm as an Inductive Bias for Relative Pose Prediction by ViTs
10th International Conference on 3D Vision (3DV 2022).

Nilesh Kulkarni, Justin Johnson, **David F. Fouhey**.
Directed Ray Distance Functions for 3D Scene Reconstruction.
At 17th European Conference on Computer Vision (ECCV 2022).

Samir Agarwala, *Linyi Jin*, *Chris Rockwell*, **David F. Fouhey**.
PlaneFormers: From Sparse View Planes to 3D Reconstruction.
At 17th European Conference on Computer Vision (ECCV 2022).

Ziyang Chen, **David F. Fouhey**, Andrew Owens.
Sound Localization with Self-Supervised Time-Delay Estimation.
At 17th European Conference on Computer Vision (ECCV 2022).

Shengyi Qian, *Linyi Jin*, *Chris Rockwell*, *Siyi Chen*, **David F. Fouhey**.
Understanding 3D Object Articulation in Internet Videos.
35th Conference on Computer Vision and Pattern Recognition (CVPR 2022)

Weiye Mei, Haoyu Wang, **David F. Fouhey**, Weiqi Zhou, Isabella Hinks, Josh M. Gray, Derek Van Berkel Meha Jain.
Using Deep Learning and Very-High-Resolution Imagery to Map Smallholder Field Boundaries.
Remote Sensing *14*(13), 3046, 2022.

Brian C. Weeks, *Zhizhuo Zhou*, Bruce K. O'Brien, Rachel Darling, Morgan Dean, Tiffany Dias, *Gemmechu Hassena*, Mingyu Zhang, **David F. Fouhey**.
A deep neural network for high throughput measurement of functional traits on museum skeletal specimens.
Accepted in Methods in Ecology and Evolution, 2022.

Sarah Jabbour, **David F. Fouhey**, Ella Kazerooni, Jenna Wiens, Michael W. Sjoding.
Combining chest X-rays and electronic health record (EHR) data using machine learning to diagnose acute respiratory failure.
Jounral of the American Medical Informatics Association, 2022.

Richard E.L. Higgins, **David F. Fouhey** Spiro K. Antiochos, Graham Barnes, Mark C.M. Cheung, J. Todd Hoeskema, K.D. Leka, Yang Liu, Peter W. Schuck, Tamas I. Gombosi.
SynthIA: A Synthetic Inversion Approximation for the Stokes Vector Fusing SDO and Hinode into a Virtual Observatory.
Accepted in The Astrophysics Journal Supplement Series, 2022.
(Note: Author order does not follow standard CV/ML conventions; I am the lead senior computational author)

2021:

Dandan Shan*, *Richard E.L. Higgins**, **David F. Fouhey.**
COHESIV: Contrastive Object and Hand Embedding Segmentation In Video.
At 35th Conference on Neural Information Processing Systems (NeurIPS 2021).

Alexander Raistrick, *Nilesh Kulkarni*, **David F. Fouhey**.
Collision Replay: What Does Bumping Into Things Tell You About Scene Geometry.
At 32nd British Machine Vision Conference (BMVC 2021).
(Oral: 3.3% acceptance rate)

Linyi Jin, *Shengyi Qian*, Andrew Owens, **David F. Fouhey.**
Planar Surface Reconstruction from Sparse Views.
At the 17th International Conference on Computer Vision (ICCV 2021).
(Oral: 3.3% acceptance rate)

Chris Rockwell, **David F. Fouhey**, Justin C. Johnson.
PixelSynth: Generating a 3D-Consistent Experience from a Single Image
At the 17th International Conference on Computer Vision (ICCV 2021).

Zhizhuo Zhou, *Gemmechu Hassena*, Brian C. Weeks, **David F. Fouhey.**
Quantifying Bird Skeletons
CV4 Animals Workshop at 34th Conference on Computer Vision and Pattern Recognition
(Note: lightly peer reviewed)

Richard E.L. Higgins, **David F. Fouhey**, *Dichang Zhang*, Spiro K. Antiochos, Graham Barnes, Todd Hoeksema, KD Leka, Yang Liu, Peter W Schuck, Tamas I. Gombosi.
Fast and Accurate Emulation of the SDO/HMI Stokes Inversion with Uncertainty Quantification.
Accepted in The Astrophysical Journal (Impact Factor: 5.746), 2021.
(Note: Author order does not follow standard CV/ML conventions; I am the lead senior computational author)

2020:

Shengyi Qian*, *Linyi Jin**, **David F. Fouhey.**
Associative3D: Volumetric Reconstruction from Sparse Views.
At the 16th European Conference on Computer Vision (ECCV 2020).

Christopher Rockwell, **David F. Fouhey.**
Full-Body Awareness from Partial Observations.
At the 16th European Conference on Computer Vision (ECCV 2020).

Sarah Jabbour, **David F. Fouhey**, Ella Kazerooni, Michael Sjoding, Jenna Wiens.
Deep Learning Applied to Chest X-Rays: Exploiting and Preventing Shortcuts.
Machine Learning for Healthcare (MLHC), 2020.

Ung Hee Lee, Justin Bi, Rishi Patel, **David F. Fouhey**, Elliot Rouse.
Image Transformation and CNNs: A Strategy for Encoding Human Locomotor Intent for Autonomous Wearable Robot.
IEEE Robotics and Automation Letters and IROS, 2020.

Dandan Shan, *Jiaqi Geng**, *Michelle Shu**, **David F. Fouhey**.
Understanding Human Hands in Contact at Internet Scale.
At the 33rd Conference on Computer Vision and Pattern Recognition, (CVPR 2020).
(Oral: 6.6% acceptance rate)

Mohamed El Banani, Jason Corso, **David F. Fouhey**.
Novel Object Viewpoint Estimation through Reconstruction Alignment.
At the 33rd Conference on Computer Vision and Pattern Recognition, (CVPR 2020).

Nilesh Kulkarni, Abhinav Gupta, **David F. Fouhey**, Shubham Tulsiani.
Articulation-aware Canonical Surface Mapping.
At the 33rd Conference on Computer Vision and Pattern Recognition, (CVPR 2020).

Jean Young Song, John Joon Young Chung, **David F. Fouhey**, Walter S. Lasecki
C-Reference: Improving 2D to 3D Object Pose EstimationAccuracy via Crowdsourced Joint Object Estimation
At Computer-supported Cooperative Work, (CSCW 2020).

2019:

A. Szenicer*, **D.F. Fouhey***, A. Muñoz-Jaramillo, P. Wright, R. Thomas, R. Galvez, M. Jin, M.C.M. Cheung.
A Deep Learning Virtual Instrument for Monitoring Extreme UV Solar Spectral Irradiance.
Science Advances (Impact factor: 12.8), Volume 5, Number 10, 2019.
(Note: Author order does not follow standard CV/ML conventions)

D. Zhukov, J.-B. Alayrac, R. G. Cinbis, **D.F. Fouhey**, I. Laptev, J. Sivic.
Cross-task weakly-supervised learning from instructional videos.
At the 32nd Conference on Computer Vision and Pattern Recognition (CVPR 2019).

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.
The Astrophysical Journal Supplement Series (Impact factor: 8.5), 242:7 2019.
(Note: Author order does not follow standard CV/ML conventions)

Earlier:

A. Kumar, S. Gupta, **D.F. Fouhey**, S. Levine, J. Malik.
Visual Memory for Robust Path Following.
NeurIPS 2018.
(Oral: 0.6% acceptance rate)

D.F. Fouhey, W. Kuo, A.A. Efros, J. Malik.
From Lifestyle Vlogs to Everyday Interactions.
At the 31st Conference on Computer Vision and Pattern Recognition (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.
At the 31st Conference on Computer Vision and Pattern Recognition (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.
Transactions on Pattern Analysis and Machine Intelligence: Volume 41, Issue 1.

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).*
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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).*

Talks

From Hands In Action to Possibilities of Interaction
Keynote, CVPR Ego4D-EPIC Workshop, June 2023
CVPR Workshop on Pretraining for Robotic Learning, June 2023

Understanding the Physical World From Images
New York University, March 2023
Carnegie Mellon University, RI Seminar, February 2023
University of Pennsylvania, GRASP Seminar, December 2022

Teaching Transformers to Do The 8 Point Algorithm and Other Adventures in 3D
CMU, Guest Lecture for 16822: Geometric Methods in Computer Vision

Teaching Deep Networks to Do the 8-Point Algorithm and to Understand Hands In Action
Cornell Tech, October 2022

Synthesizing Magnetograms of the Sun's Photosphere with Deep Learning
ML4PSP Seminar Series, June 2022 Watch here

Understanding 3D Scenes and Interacting Hands
Princeton PIXL Seminar, October 2022
Czech Technical University, Prague, September 2022
Google CCI Seminar, July 2022
UC Berkeley, June 2022
Columbia University, May 2022
NYU, May 2022
Cornell Tech, May 2022
CMU VASC Seminar, April 2022

Looking at a Few Images of Rooms and Many Interacting Hands
MIT Vision and Graphics Seminar, November 2021
UIUC Vision Seminar, November 2021
MIT Computational Sensorimotor Learning Seminar, August 2021
Princeton ImageX Seminar, April 2021

Building 3D Representations of Scenes from One Or Two Ordinary Images
Google Research, December 2020
Seminar on 3D Geometry and Vision, November 2020 Watch here

Fusing Computer Vision And Space Weather Modeling [or slight variants of this title]
Michigan Institute for Data Science Symposium, November 2020
Space Weather Modeling Framework Users Meeting, November 2020
Stereo & SDO PI Meeting, August 2020

Looking at Hundreds of Millions of Hands in Interaction and Only a Few Images of Rooms
UC Berkeley, January 2020

Building Fully 3D Representations
Stanford/Toyota Research Workshop, January 2020

Boring Interactions and Exciting Sculptures
UC Berkeley, June 2019

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