

Peiyun Hu

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Research Interest

My research focuses on computer vision, often motivated by the task of developing perception systems for autonomous robots. My work uses machine learning and deep learning, with a focus on improving the robustness and scalability of learning-based perception.

Education

- Now **Ph.D. Student**, Robotics Institute, Carnegie Mellon University
Advisor: Deva Ramanan
- 2016 **Master of Science** in Computer Science, UC Irvine
- 2014 **Bachelor of Science** in Computer Science, Tsinghua University

Work Experience

- 2019 **Research Intern**, Argo AI, *Pittsburgh, PA*
Mentor: Deva Ramanan and Jason Ziglar
- 2018 **Research Intern**, Argo AI, *Pittsburgh, PA*
Mentor: Deva Ramanan
- 2017 **Research Intern**, Amazon AI, *Palo Alto, CA*
Mentor: Zack Lipton and Anima Anandkumar
- 2016 **Research Intern**, National Robotics Engineering Center, *Pittsburgh, PA*
Mentor: Zach Pezzementi
- 2013 **Research Intern**, Microsoft Research Asia, *Beijing*
Mentor: Kaiming He

Publications

- 2021 **Peiyun Hu**, Aaron Huang, John Dolan, David Held, Deva Ramanan, “Safe Local Motion Planning with Self-Supervised Freespace Forecasting”, *CVPR 2021*
- 2020 **Peiyun Hu**, Jason Ziglar, David Held, Deva Ramanan, “What You See is What You Get: Exploiting Visibility for 3D Object Detection”, *CVPR 2020* (oral)

Peiyun Hu, David Held, Deva Ramanan, “Learning to Optimally Segment Point Clouds”, *RA-L & ICRA 2020*

Siddharth Ancha, Yaadhav Raaj, **Peiyun Hu**, Srinivasa Narasimhan, David Held, “Active 3D Perception using Light Curtains”, *ECCV 2020* (spotlight)

2019 **Peiyun Hu**, Zack Lipton, Anima Anandkumar, Deva Ramanan, “Active Learning with Partial Feedback”, *ICLR 2019*

Gengshan Yang, **Peiyun Hu**, Deva Ramanan, “Inferring Distributions over Depth From a Single Image”, *IROS 2019*

Siva Chaitanya, **Peiyun Hu**, Deva Ramanan, “Recognizing Tiny Faces”, *CVPR/w 2019*

2018 Zach Pezzementi, Trenton Tabor, **Peiyun Hu**, Jon Chang, Deva Ramanan, Carl Wellington, Benzun Babu, Herman Herman, “Comparing Apples and Orange: Off-Road Pedestrian Detection on the National Robotics Engineering Center Agricultural Person-Detection Dataset”, *JFR 2018*

Chen Fu, **Peiyun Hu**, Chiyu Dong, Christopher Mertz, John Dolan, “Camera-Based Semantic Enhanced Vehicle Segmentation for Planar LiDAR”, *ITSC 2018*

2017 **Peiyun Hu**, Deva Ramanan, “Finding Tiny Faces”, *CVPR 2017*

Manuel Günther, **Peiyun Hu**, Christian Herrmann, Chi-Ho Chan, Min Jiang, Shufan Yang, Akshay Raj Dhamija, Deva Ramanan, Jürgen Beyerer, Josef Kittler, Mohamad Al Jazaery, Mohammad Iqbal Nouyed, Guodong Guo, Cezary Stankiewicz, Terrance E Boulton, “Unconstrained Face Detection and Open-set Face Recognition Challenge”, *IJCB 2017*

2016 **Peiyun Hu**, Deva Ramanan, “Bottom-up and Top-down Reasoning with Hierarchical Rectified Gaussians”, *CVPR 2016* (spotlight)

2012 Xiaohui Wang, Jia Jia, **Peiyun Hu**, Sen Wu, Jie Tang, Lianhong Cai, “Understanding the Emotional Impact of Images”, *ACM MM 2012*

Jia Jia, Sen Wu, Xiaohui Wang, **Peiyun Hu**, Lianhong Cai, Jie Tang, “Can We Understand Van Gogh’s Mood? Learning to Infer Affects from Images in Social Networks”, *ACM MM 2012*

Teaching

2019 **Head Teaching Assistant**, Computer Vision (16-720), Spring 2019, CMU
Instructor: Srinivasa Narasimhan and Yaser Sheikh

2018 **Teaching Assistant**, Methods In (Bio)Medical Image Analysis (16-725), Spring 2018, CMU
Instructor: John Galeotti

Mentoring

- Now Aaron Huang, Master of Science in Robotics, CMU
- 2020 Fanyue Xia, Undergrad in Computer Science, CMU
- 2018 Siva Chaitanya Mynepalli, Master of Science in Robotics, CMU
Gengshan Yang, Master of Science in Robotics, CMU

Invited Talks

- 2020 “What You See Is What You Get: Exploiting Visibility for 3D Object Detection”
Uber Advanced Technologies Group (ATG) Research Toronto
- “Learning to Perceive and Plan by Exploiting Hidden Information from in 3D Sensing”
CMU Argo AI Center for Autonomous Vehicle Research
- 2017 “Finding Tiny Faces”
Intel Science and Technology Center for Visual Cloud Systems

Academic Service

Refereeing: Conferences and Journals

- 2021 CVPR, RA-L, IROS
- 2020 CVPR, SIGGRAPH, NeurIPS, ICLR, RA-L, IV
- 2019 CVPR, ICCV, T-PAMI, NeurIPS, ICML, PR, SP-L
- 2018 CVPR, NeurIPS, IJCV
- 2016 T-PAMI

Quals Committee

- 2021 Haochen Wang, Master of Science in Robotics, CMU
Aaron Huang, Master of Science in Robotics, CMU
- 2020 Ye Yuan, Ph.D. in Robotics, CMU
Xinshuo Weng, Ph.D. in Robotics, CMU
- 2018 Siva Chaitanya Mynepalli, Master of Science in Robotics, CMU
Gengshan Yang, Master of Science in Robotics, CMU

Admission Committee

2019 Master of Science in Computer Vision

2018 Master of Science in Computer Vision

Outreach

2020 **Mentor**, CMU AI Mentoring Program

Selected Media Coverage

2020 [Self-Driving Cars That Recognize Free Space Can Better Detect Objects](#)
CMU News, ScienceDaily, Phys.org

[To improve self-driving algorithms, add the concept of empty space](#)
Electronics Weekly

2017 [Finding Faces in a Crowd - Context Is Key When Looking for Small Things in Images](#)
CMU News, ScienceDaily, Phys.org

[Democrats call for a review of face recognition tech](#)
MIT Technology Review

[New tech can spot small faces in the crowd](#)
TechCrunch

[Use of foveal descriptors help improve facial recognition](#)
The Tartan

[Automated face detection improves with CMU 'tiny faces' algorithm](#)
Laser Focus World