Shumian Xin

Education

Carnegie Mellon University

Xi'an Jiaotong University

Pittsburgh, PA, USA

Ph.D. in Robotics

Aug 2017 - Dec 2022

Master in Electrical and Computer Engineering

Aug 2015 – Dec 2016

Musier in Electrical and Computer Engineeri

Xi'an, China

Bachelor in Electrical Engineering and Automation

Sep 2011 – Jun 2015

Enrolled in the Special Class for the Gifted Young of China

Advisors: Prof. Ioannis Gkioulekas and Prof. Srinivasa Narasimhan

Professional Experience

o **Adobe Inc.** San Jose, CA, USA

Research Scientist Jan 2023 – Present

- Working on computational photography research and product

o Google Research Mountain View, CA, USA

Research Intern and Student Researcher

May – Nov 2020

- Worked with Rahul Garg, Neal Wadhwa, and other colleagues on defocus map estimation and deblurring from a single dual-pixel image
- Research work published in ICCV 2021

o Carnegie Mellon University Doctoral Research Assistant

Pittsburgh, PA, USA

Aug 2017 – Dec 2022

- Worked with Prof. Ioannis Gkioulekas and Prof. Srinivasa Narasimhan on 3D reconstruction using differential imaging (Ph.D. thesis)
- Leveraged differential imaging, an imaging mechanism that takes multiple measurements with infinitesimal changes in illumination and/or the camera, for challenging 3D reconstruction problems, including non-line-of-sight imaging, single-shot depth from defocus, and specular object reconstruction

Research Staff Jun 2016 – Jul 2017

- Worked with Prof. Srinivasa Narasimhan on developing rendering tools for light transport parsing
- Rendered photorealistic images with a modern ray tracer to simulate various imaging schemes, e.g., epipolar-only, non-epipolar-only, and depth-gating, based on light transport and epipolar geometry

Master Student Researcher

Jan – May 2016

- Worked with Prof. Aswin Sankaranarayanan on light field stereo
- Proposed a novel stereo configuration by replacing regular cameras with light field cameras, which are essentially camera arrays with tiny baselines, and formulated an optimization problem for depth estimation by combining large and small baselines

University of California, Los Angeles

Los Angeles, CA, USA

Summer Undergraduate Student Researcher

Jul – Sep 2014

- Worked with Prof. Vwani Roychowdhury on a computer vision feature selection framework
- Received Outstanding Research and Presentation Skills Award in the UCLA-CSST program

Publications

Defocus Map Estimation and Deblurring from a Single Dual-Pixel Image [webpage, paper, code]
 Shumian Xin, Neal Wadhwa, Tianfan Xue, Jonathan Barron, Pratul Srinivasan, Jiawen Chen, Ioannis Gkioulekas, and Rahul Garg

IEEE International Conference on Computer Vision (ICCV), 2021

Oral Presentation

o **A Theory of Fermat Paths for Non-Line-of-Sight Shape Reconstruction** [webpage, paper, code] **Shumian Xin**, Sotiris Nousias, Kiriakos N. Kutulakos, Aswin C. Sankaranarayanan, Srinivasa G. Narasimhan, and Ioannis Gkioulekas

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019

Oral Presentation, Best Paper Award out of 5000 submissions

Invited Talks

o A Theory of Fermat Paths for Non-Line-of-Sight Shape Reconstruction [link] Jun 2020

Keynote speaker, Computational Cameras and Displays (CCD) Workshop, CVPR

Professional Service and Teaching

o Journal and Conference Reviewer

IEEE Transactions on Computational Imaging, Optics Express, ICCV

Student Volunteer

- International Conference on Computational Photography (ICCP)

2018, 2022

Teaching Assistant

- 16-720 Computer Vision, Carnegie Mellon University

Fall 2019, Spring 2020

Awards

o Microsoft Research PhD Fellowship Finalist

2020

CVPR Best Paper Award

2019

UCLA-CSST Scholarship

2014

- Awarded to students in the cross-disciplinary scholars in science and technology (CSST) program for conducting summer research at UCLA
- National Scholarship

2013, 2014

- Highest scholarship for Chinese undergraduate students

Technical Skills

- o **Programming Languages and Libraries:** Python, C++, Matlab, PyTorch, Tensorflow, JAX, OpenCV
- o Tools: Linux Script, LaTex, HTML