BHARGAV SACHIN GHANEKAR

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Passionate about developing imaging and display systems and algorithms using ideas from Signal Processing, Computer Vision, Optics, and Deep Learning

EDUCATION

Rice University — Houston, TX
PhD. student, Electrical and Computer Engineering *(3.95/4.00)*

Carnegie Mellon University — Pittsburgh, PA
Master of Science, Electrical and Computer Engineering *(3.92/4.00)* — Dec 2019

Indian Institute of Technology Madras — Chennai, India
Bachelor of Technology, Engineering Physics *(9.37/10.00)* — Jul 2018

Coursework –
Deep Learning, Computer Vision, Computational Photography, Image Processing, Digital Signal Processing, Optics, Computer Systems, Data Structures and Algorithms

SKILLS

Programming: C/C++, Python, MATLAB, OpenCV, PyTorch, Tensorflow, Unity
Experimental: Optics, Spatial Light Modulators, Two-photon lithography

WORK EXPERIENCE

NPI Vision Software Engineer Intern — Jun 2019 – Aug 2019 and Feb 2020 – Aug 2020
Intuitive Surgical Inc. — Sunnyvale, CA

- Developed tools and software for performance evaluation of color stereo-vision systems
- Explored deep learning methods for performance evaluation of color stereo-vision systems

ACADEMIC RESEARCH EXPERIENCE AND PROJECTS

Snapshot 3D sensing using polarization and defocus — Aug 2022 - ongoing
Computational Imaging Lab, ECE Rice (Guide: Prof. Ashok Veeraraghavan)

- Developing systems and methods for combining polarization and defocus cues for passive 3D sensing

Snapshot 3D sensing for fiber-based endoscopy — May 2021 - ongoing
Computational Imaging Lab, ECE Rice (Guide: Prof. Ashok Veeraraghavan)

- Developing lens-less imaging systems and algorithms to enable 3D sensing for fiber-bundle endoscopy methods

Monocular, snapshot 3D sensing for extended, linear structures — Aug 2020- ongoing
Computational Imaging Lab, ECE Rice (Guide: Prof. Ashok Veeraraghavan)

- Developed a novel polarizer-phase mask PSF encoding to enable 3D reconstruction of extended, linear structures

Depth imaging analysis using double-helix point spread functions — Jan 2019- May 2019
Research Assistantship under Prof. Aswin Sankaranarayanan, CMU — Pittsburgh, PA

- Performed a theoretical analysis of the Double-helix rotating PSF for depth estimation in terms of Fisher information criterion in comparison to standard lens systems

2-D Phase Unwrapping Methods for Radar Imaging — Aug 2017- Jul 2018
B.Tech. Project under Dr. Uday Khankhoje, EE Dept. IIT Madras — Chennai, India

- Developed novel 2D phase unwrapping techniques using total variational methods, resulting in 2 publications

SELECTED PUBLICATIONS

Ghanekar, Bhargav, et al. "PS^{2}F: Polarized Spiral Point Spread Function for Single-Shot 3D Sensing." *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2022). **[Best Paper award at ICCP 2022]**

Ghanekar, Bhargav, and Uday K. Khankhoje. "Phase unwrapping of coarsely sampled maps using higher-order methods." *IEEE Transactions on Geoscience and Remote Sensing* (2021).

AWARDS

Sri. Jandhyala Lakshmi Kantam and Srimati Sitamahalakshmi Prize — Jul 2018
Awarded by the IIT Madras for second best academic record in B.Tech. Engineering Physics