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