Salman Siddique Khan

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ABOUT ME

I am a Postdoctoral Associate in the Department of Electrical and Computer Engineering, Rice University. My field of research is Computational Photography, Computer Vision and Deep Learning. I work on designing new imaging systems and computational techniques that extend the capabilities of conventional cameras.

EDUCATION

Indian Institute of Technology Madras, India **Jul. 2018 – Jul. 2023**
Ph.D., Electrical Engineering
- Advisor: Prof. Kaushik Mitra
- Thesis: Learning-based Scene Reconstruction, Design and Inference in Lensless Imaging

National Institute of Technology Rourkela, India **Jul. 2014 – Jul. 2018**
B.Tech., Electronics and Instrumentation Engineering
- CGPA: 8.9/10

WORK EXPERIENCE

Rice University **Aug. 2023 – Present**
Postdoctoral Associate *Houston, TX*
I work with Prof. Ashok Veeraraghavan and Prof. Ashutosh Sabharwal. My research is on developing deep learning and computational photography tools for Digital Health.

NEC Labs America **Jun. 2022 – Dec. 2022**
Research Intern *San Jose, CA*
I worked in the Media Analytics team with Dr. Manmohan Chandraker and Dr. Francesco Pittaluga. I worked on deep learning to design optical encryption cameras that can preserve the privacy of a scene entirely by encrypting the light from the scene using multiple coded optical masks.

Rice University **May 2019 – Nov. 2019, Jan. 2021 – Jul. 2021**
Research Associate *Houston, TX*
I worked in the Rice Computational Imaging Lab headed by Prof. Ashok Veeraraghavan. I worked on developing purely deep learning techniques to design camera hardware that can enhance the privacy of the scene they are deployed in.

Indian Statistical Institute **May 2016 – Jul. 2016**
Intern *Kolkata, WB*
I worked in the Electronics and Communication Sciences Unit of ISI Kolkata on random forest based histopathology image segmentation.

GRANTS AND AWARDS

- Awarded Government of India **Technology and Startup Funding** 2021-23 (TSF) to develop and commercialize Jointly Designed Optics and AI for 3D Endoscopic Imaging.
- Awarded the **Qualcomm Innovation Fellowship** India 2020-21 to develop Reconstruction, Design, and Inference

Algorithms for Lensless Imaging.
- Awarded **Google Travel Grant** to attend ICCV 2019 at Seoul, South Korea.

PUBLICATIONS

Journal

- Bagadthey, D., Prabhu, S., **Khan, S. S.**, Fredrick, D. T., Boominathan, V., Veeraraghavan, A., & Mitra, K. (2022). FlatNet3D: Intensity and absolute depth from single-shot lensless capture. JOSA A, 39(10), 1903-1912.
- **Khan, S. S.**, Sundar, V., Boominathan, V., Veeraraghavan, A., & Mitra, K. (2020). FlatNet: Towards photorealistic scene reconstruction from lensless measurements. IEEE Transactions on Pattern Analysis and Machine Intelligence, 44(4), 1934-1948.

Conference Proceedings

- **Khan, S. S.**, Boominathan, V., Veeraraghavan, A., & Mitra, K. (2023, July). Designing Optics and Algorithm for Ultra-Thin, High-Speed Lensless Cameras. In 2023 IEEE International Conference on Multimedia and Expo (ICME) (pp. 1583-1588).
- Saha, A., **Khan, S. S.**, Sehrawat, S., Prabhu, S. S., Bhattacharya, S., & Mitra, K. (2022, October). LWGNet-Learned Wirtinger Gradients for Fourier Ptychographic Phase Retrieval. In European Conference on Computer Vision (pp. 522-537).
- Tan, J., **Khan, S. S.**, Boominathan, V., Byrne, J., Baraniuk, R., Mitra, K., & Veeraraghavan, A. (2020, July). Canopic: Pre-digital privacy-enhancing encodings for computer vision. In 2020 IEEE International Conference on Multimedia and Expo (ICME) (pp. 1-6).
- **Khan, S. S.**, Adarsh, V. R., Boominathan, V., Tan, J., Veeraraghavan, A., & Mitra, K. (2019). Towards photorealistic reconstruction of highly multiplexed lensless images. In Proceedings of the IEEE/CVF International Conference on Computer Vision (pp. 7860-7869).

Preprints

- **Khan, S. S.**, Yu, X., Mitra, K., Chandraker, M., & Pittaluga, F. (2023). OpEnCam: Lensless Optical Encryption Camera. arXiv preprint arXiv:2312.01077.

PRESENTATIONS

- "Designing Optics and Algorithm for Ultra-Thin, High-Speed Lensless Cameras," *International Conference on Multimedia and Expo 2023*, Brisbane, Australia, July 2023.
- "LWGNet-Learned Wirtinger Gradients for Fourier Ptychographic Phase Retrieval," *International Conference on Computational Photography 2022*, Pasadena, California, August 2022.
- "Towards photorealistic reconstruction of highly multiplexed lensless images," *International Conference on Computer Vision 2019*, Seoul, South Korea, October 2019.

TEACHING EXPERIENCE

I served as a Teaching Assistant for the following courses at IIT Madras:

- **EE 5176 Computational Photography**: Spring 2019, 2021, 2022
- **EE 6132 Modern Computer Vision**: Fall 2020
- **EE 5180 Introduction to Machine Learning**: Spring 2023
- **EE 1101 Signals and Systems**: Spring 2020
- **EE 3110 Probability Foundations for Electrical Engineers**: Fall 2021

PROFESSIONAL SERVICES

I regularly serve as a reviewer for the following publications:

- IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)
- IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- European Conference on Computer Vision (ECCV)
- IEEE Transactions on Computational Imaging (TCI)
- IEEE Open Journal of Signal Processing
- Optica Optics Express

SKILLS

- Programming Languages – Python, MATLAB, C++.
- Machine Learning Frameworks – PyTorch, Tensorflow, scikit-Learn.
- Fabrication Tools – Nanoscribe Photolithography
- Experience and knowledge in computer vision, image processing, machine learning, deep learning, computational imaging and solving inverse problems.