Prasan Shedligeri

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PhD candidate

Department of Electrical Engineering, IIT Madras

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EDUCATION

- **Indian Institute of Technology, Madras** — Chennai, India
  Direct PhD in Electrical Engineering; **CGPA**: 9.17/10 — July 2016 – Present
  - Field of Research: **Computational Photography, Computer Vision, Image Processing, Deep learning**
  - Skills: Python, Matlab, Pytorch, Deep learning, Excellent English communication (both spoken and written)
  - Key Courses: *Computational Photography, Machine Learning for Computer Vision, Probability and Random Processes, Linear Algebra, Convex Optimization, Photometry and Geometry based Computer Vision, Image Signal Processing*
- **M.S. Ramaiah Institute of Technology** — Bengaluru, India
  B.E. in Electronics and Communication Engineering; **CGPA**: 9.50/10 — Aug. 2011 – June 2015
  - Key Courses: *Digital Image Processing, Numerical Methods in Mathematics, Object Oriented Programming with C++, Cryptography and Network Security*
  - **Thesis**: Hardware Implementation of a Digital Watermarking System for Video Authentication

Publications

SeLFVi: Self-supervised Light-Field Video Reconstruction from Stereo Video

- *Accepted at International Conference on Computer Vision (ICCV), 2021*
  Authors: **Prasan Shedligeri**, Florian Schiffers, Sushobhan Ghosh, Oliver Cossairt, Kaushik Mitra

Improving Acquisition Speed of X-Ray Ptychography through Spatial Undersampling

- *IEEE International Conference on Image Processing (ICIP), 2021*
  Authors: **Prasan Shedligeri**, Florian Schiffers, Semih Barutcu, Pablo Ruiz, Aggelos Katsaggelos, Oliver Cossairt

Regularization for Undersampled Ptychography

- *OSA Computational Optical Sensing and Imaging (COSI) 2021*
  Authors: **Prasan Shedligeri**, Florian Schiffers, Semih Barutcu, Pablo Ruiz, Aggelos Katsaggelos, Oliver Cossairt

High Frame Rate Optical Flow Estimation from Event Sensors via Intensity Estimation

- *Elsevier Journal of Computer Vision and Image Understanding (CVIU), 2021*
  Authors: **Prasan Shedligeri**, Kaushik Mitra

CodedRecon: Video reconstruction for coded exposure imaging techniques

- *Elsevier Journal of Software Impacts (SIMPAC), 2021 (Invited publication)*
  Authors: **Prasan Shedligeri**, Anupama S, Kaushik Mitra

A Unified Framework for Compressive Video Recovery from Coded-Exposure Techniques

- *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2021*
  Authors: **Prasan Shedligeri**, Anupama S, Kaushik Mitra

Video Reconstruction by Spatio-Temporal Fusion of Blurred-Coded Image Pair

- *IAPR 25^{th} International Conference on Pattern Recognition (ICPR), 2020*
  Authors: Anupama S, **Prasan Shedligeri**, Abhishek Pal, Kaushik Mitra

Photorealistic Image Reconstruction from Hybrid Intensity and Event based Sensor

- *SPIE Journal of Electronic Imaging (JEI), 2019*
  Authors: **Prasan Shedligeri**, Kaushik Mitra

Data Driven Coded Aperture Design for Depth Recovery

- *IEEE International Conference on Image Processing (ICIP), 2017, Beijing, China*
  Authors: **Prasan Shedligeri**, Sreyas Mohan, Kaushik Mitra

Scholastic Achievements

- Selected for Doctoral Consortium at the IEEE WACV 2021 where I was mentored by Dr. Amanda Fernandez, an assistant professor at UTSA.
- Secured a Research Travel Scholarship of 5000 USD from RBC-DSAI[1], IIT Madras to visit Northwestern University as a short-term visiting scholar.

[1] Robert Bosch Centre for Data-Science and AI https://rbc-dsai.iitm.ac.in

- Secured internship at Samsung Research Institute, Bengaluru during the summer of 2018.
- One of the 20 finalists out of 95 competing teams across 7 premier Indian institutes in QInF[2] India 2018. The 95 competing teams were from 7 different premier Indian institutes.
- Awarded travel grant of 1000 USD to attend IEEE International Conference on Image Processing 2017 by IEEE Signal Processing Society.
- Ranked 704 in the country in GATE[3] 2016, attempted by over 150,000 students.

Academic Projects

Post-capture aperture and focus control for videos

- *IIT Madras* Sep 2020 –

  Dr. Kaushik Mitra
  - Stereo cameras effectively capture the geometry in the scene.
  - Devised an unsupervised algorithm for light field video reconstruction from stereo video.

Light-field dimensionality reduction for hogel basis screen

- *Northwestern University* Aug 2019 – Aug 2020

  Dr. Oliver Cossairt, Dr. Aggelos Katsaggelos
  - An physical, optical-decoder based learning-based algorithm was designed
  - Dimensionality reduction by $\times 100$ was demonstrated.

High-speed imaging using hybrid sensors

- *IIT Madras* Aug 2017 – May 2018

  Ketul Shah, Dhruv Kumar, Dr. Kaushik Mitra
  - Combined the advantages of a traditional CMOS sensor and a novel event-based sensor to design algorithm for recovering high spatio-temporal resolution video.
  - Collected a video dataset where a CMOS sensor (DSLR) and the event sensor were co-located using a beam-splitter.

TEACHING EXPERIENCE

- **Deep Learning for Image Processing for Dr. K. Mitra and Dr. A. N. Rajagopalan** Fall 2017
  IIT Madras
- **Digital Signal Processing for Dr. Kaushik Mitra** Winter 2018
  IIT Madras
- **Lab for Data Analytics for Dr K. Mitra and Dr. V. Ramaiyan** Fall 2018
  IIT Madras
- **Computational Photography for Dr. K. Mitra** Winter 2019,2021
  IIT Madras
- **Modern Computer Vision for Dr. K. Mitra and Dr. A. N. Rajagopalan** Fall 2020
  IIT Madras

WORK EXPERIENCE

- **Summer Internship** Samsung Research Institute, Bengaluru
  Research Intern May 2018 – July 2018
  - Mentored by Dr. Rituparna Sarkar, I worked towards developing a exposure-robust algorithm for depth estimation from monocular video.
- **Graduate Engineer Trainee** Idea Cellular Limited
  Switch Engineer June 2015 – April 2016
  - Worked with a team of 12 people helping them to maintain the core nodes in a cellular network like HLR and MSCs.

[2] Qualcomm Innovation Fellowship: a one year fellowship with 1 million INR awarded to 7 innovative projects
[3] A nationwide entrance test for postgraduate studies in engineering