Dr. Prasan **Shedligeri**

Senior Engineer | PhD - Image and Video Processing

About me

Prasan is a passionate researcher with a PhD + Postdoc in Computer Vision, and 2+ years of industry experience at Sony Semiconductors. He specializes in image processing, object detection, and multispectral image segmentation, with expertise in transfer learning and edge AI deployment. His work focuses on developing robust AI models and leveraging synthetic data for real-world applications.

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Personal Website

Languages

Kannada - Native Language

English - Professional Knowledge

Hindi - Professional Knowledge

German - Intermediate Knowledge

Professional Skills

Image Processing | Deep Learning | Computational Imaging | Python | Computer Vision

Publication Record

ECCV | ICCV | WACV | ICIP | CVIU | ICPR

EDUCATION

2016–2021 — Chennai, India

MS, PhD
Indian Institute of Technology Madras
Dr. Kaushik Mitra
Multi-view video conversion from 2D video
CGPA: 9.29/10

2011–2015 — Belgaum, India

Bachelors of Engineering
Visvesvaraya Technological University
Electronics Engineering
CGPA: 9.50/10

WORK EXPERIENCE

2023-Today — Stuttgart, Germany

Senior Engineer
Sony Semiconductor Solutions
As part of the Imaging group, I developed object detection and image segmentation models, optimizing them for edge deployment and robustness using synthetic data. Also explored transfer learning and pretraining techniques for image segmentation in multispectral and computed tomography imaging modalities.

2022-Today — Bonn, Germany

Postdoctoral Fellow
University of Bonn
Mentored by Prof. Matthias Hullin at the Institute for Computer Science II, I pursued a Trans-disciplinary Research Project where I used physics-based modeling for 3D reconstruction and automatic geometric calibration of a self-organizing lenslet array.

2019-2020 — Evanston, USA

Pre-doctoral fellow
Northwestern University
Collaborated with Prof. Oliver Cossairt and Prof. Aggelos Katsaggelos in developing a deep-learning based light-field dimensionality reduction technique for a hogel-basis based holographic display. Simultaneously, I developed a regularization technique for X-ray ptychographic reconstruction which helped in achieving high quality reconstruction under limited sample measurements.

INFORMATION TECHNOLOGY SKILLS

Deep learning	**Pytorch**: *Advanced* **Tensorflow**: *Intermediate*
Operating systems	**Linux** : *Advanced* **Windows**: *Advanced*
Image and Video Analysis	**OpenCV, Scikit-image, ...** : *Advanced* **matplotlib, seaborn**: *Intermediate* **numpy, scipy, ...**: *Advanced*
3D rendering and reconstruction	**CUDA** : *Basic* **Mitsuba**: *Intermediate* **OptiX**: *Intermediate*
Office Automation	**MS Office (Excel, Word, PowerPoint)**: *Higly Specialized* **LaTeX**: *Advanced* **Git**: *Intermediate*

</> PROGRAMMING LANGUAGES

- **Python**: Highly Specialised
- **C/C++**: Intermediate
- **Matlab**: Advanced

Soft Skills and Strengths

Creativity | Curiosity | Flexibility | Self Confidence | Ability to Plan and Organize | Autonomy | Adaptability | Eye for Details | Problem Solving | Team Working | Love Learning New Things | Leadership | Good Communication | Managing Information | Diplomacy | Good Listener | Patience

Courses completed/taught

- Image Signal Processing
- Computational Imaging
- Camera Geometry and Photometry
- Deep learning for Computer Vision
- Machine Learning for CV
- Data Analytics with Pandas

Technical Domain

- Light-fields/3D reconstruction: Unsupervised learning-based synthesis of light-field videos from smartphones
- Video Processing: Recovering high speed videos from event sensors and coded-exposure sensors
- Deep Learning: CNNs, LSTMs, GANs, Recurrent networks, Classifiers, ...

Other Interests

- Biking
- Journalling
- Cooking
- Travel
- Movies
- Books

Download My CV

Download my CV via the QR below.

Achievements, honours and awards

- Winner of the Qualcomm Innovation Fellowship (QIF) for the year 2021-22 for a proposal titled *Self-supervised Light-Field Video Reconstruction for Smartphones*
- Invited for a guest lecture at Northwestern University on *Multi-view video reconstruction and 3D imaging*
- Invited to publish article in the *Journal of Software Impacts* for open-sourcing impactful software.
- Secured a Research Travel Scholarship of 5000 USD from RBC-DSAI, IIT Madras to visit Northwestern University as a short-term visiting scholar
- Reviewer for WACV 2021, 2022, 2023, ICIP 2022, Siggraph Asia 2022
- Secured internship at Samsung Research Institute, Bengaluru during the summer of 2018
- Selected for Doctoral Consortium at the IEEE WACV 2021 where I was mentored by Dr. Amanda Fernandez, an assistant professor at UTSA

Research Summary

Multiview video reconstruction for smartphones While multi-view/light-field (LF) imaging allows for capture of 3D scene content, LF videos are challenging to acquire due to their large data bandwidth requirement. Hence, we propose to **reconstruct multi-view videos** through solving the ill-posed problem of light-field reconstruction **from stereo and monocular video sequences.** A **self-supervised technique** that uses an intermediate low-rank representation helps us generalize well to novel test videos without the need for any large ground-truth LF video datasets. This innovative idea won the prestigious **Qualcomm Innovation Fellowship** and was published in top-tier CV conferences.

3D reconstruction of self-organizing lenslet arrays It's challenging to recover a 3D surface shape of a lenslet array made of a transparent polymer like PDMS sitting on top of a transparent platform of acrylic glass. So, we built a hardware system that measures the light-rays directions incident and refracted through the surface. We exploit the regular shape of each lenslet to model the surface in a low-parameter space. We use rendering and inverse rendering tools like OptiX and Mitsuba to optimize for the parameters given the incident and refracted light-ray directions.

SELECT PUBLICATIONS

[Full list]

Conference Proceedings 2022
Synthesizing Light Field Video from Monocular Video, Shrisudhan G, Prasan Shedligeri, Sarah, Kaushik Mitra, *European Conference on Computer Vision (ECCV)* ,

Conference Proceedings 2021
SeLFVi: Self-supervised Light-Field Video Reconstruction from Stereo Video, Prasan Shedligeri, Florian Schiffers, Sushobhan Ghosh, Oliver Cossairt, Kaushik Mitra, *International Conference on Computer Vision (ICCV)* ,

Conference Proceedings 2021
A Unified Framework for Compressive Video Recovery from Coded Exposure Techniques, Prasan Shedligeri, Anupama S, Kaushik Mitra, *Winter Conference on Applications of Computer Vision (WACV)*,

Journal Article 2021
High frame rate optical flow estimation from event sensors via intensity estimation, Prasan Shedligeri, Kaushik Mitra, *Elsevier Computer Vision and Image Understanding*,

Conference Proceeding 2021
Improving Acquisition Speed of X-Ray Ptychography through Spatial Undersampling and Regularization, Prasan Shedligeri, F Schiffers, S Barutcu, P Ruiz, O Cossairt, A Katsaggelos, *International Conference on Image Processing*,