Dr. Prasan **Shedligeri**

Postdoc | PhD-Image Processing

About me

Prasan is a passionate and independent researcher with 1 year of experience as Postdoc and 5+ years of experience of research in the fields of Image Processing, Computational Imaging and low-level Computer Vision. He is trained in applying modern deep learning tools and techniques, as well as traditional machine-learning approaches to solve challenging problems with innovative approaches. Enthusiastic towards embracing and exploring new technologies and challenges in Image Processing and Vision-related areas.

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asprasan

Portfolio

Languages

Kannada - Native Language

English - Professional Knowledge

Hindi - Professional Knowledge

German - Basic 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
Image Processing and Computational Imaging
CGPA: 9.29/10

2011–2015 — Belgaum, India

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

WORK EXPERIENCE

2022-Today — Bonn, Germany

Postdoctoral Fellow
University of Bonn
Mentored by Prof. Matthias Hullin at the Institute for Computer Science II, I am involved in a Trans-disciplinary Research Project where I use physics-based modeling for 3D reconstruction and automatic geometric calibration of 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.

May-Aug 2018 — Bengaluru, India

Summer Research Intern
Samsung Research Institute
Mentored by Dr. Rituparna Sarkar, I helped design a system and novel loss function for deep-learning-based robust pose estimation and camera tracking for video sequences with changing lighting conditions.

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 CV
- 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
- Travel
- Journalling
- Movies
- Cooking
- 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 light-field and 3D imaging
- Secured a Research Travel Scholarship of 5000 USD from RBC-DSAI, IIT Madras to visit Northwestern University as a short-term visiting scholar
- Awarded travel grant of 1000 USD to attend IEEE International Conference on Image Processing 2017 by IEEE Signal Processing Society
- 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

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.

Light-field video reconstruction for smartphones While 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 the 3D scene content** 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.

SELECT PUBLICATIONS

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*,