

VIJAY RENGARAJAN

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RESEARCH AREAS Computational photography, image processing, and computer vision.

WORK EXPERIENCE

Reality Labs, Meta/Facebook, Sunnyvale, USA September 2021 – now
Research Scientist

Carnegie Mellon University, Pittsburgh, USA December 2017 – September 2021
Research Scientist at ECE

Motorola India Private Ltd., Bengaluru, India July 2008 – July 2011
Software Engineer

EDUCATION

Indian Institute of Technology Madras, Chennai, India August 2011 – November 2017
Ph.D., Electrical Engineering
Guides: Prof. A.N.Rajagopalan and Prof. R. Aravind
CGPA: 9.41/10
Thesis: *Rolling Shutter Imaging: Registration and Rectification*

PSG College of Technology, Coimbatore, India August 2004 – May 2008
Bachelor of Engineering, Electronics and Communication Engineering
CGPA: 9.48/10

PUBLICATIONS

- [CVPR2023] Ziyu Wan, Christian Richardt, Aljaz Bozic, Chao Li, *Vijay Rengarajan*, Seonghyeon Nam, Xiaoyu Xiang, Tuotuo Li, Bo Zhu, Rakesh Ranjan, and Jing Liao. “Learning Neural Duplex Radiance Fields for Real-Time View Synthesis”. Accepted to be presented at the International Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.
- [ECCV2022] Xiaoyu Xiang, Yapeng Tian, *Vijay Rengarajan*, Lucas Young, Bo Zhu, and Rakesh Ranjan. “Learning Spatio-Temporal Downsampling for Effective Video Upscaling” in European Conference on Computer Vision (**ECCV**) 2022.
- [preprint] Vishwanath Saragadam, *Vijay Rengarajan*, Ryuichi Tadano, Tuo Zhuang, Hideki Oyaizu, Jun Murayama and Aswin C. Sankaranarayanan. “Programmable Spectral Filter Arrays for Hyperspectral Imaging”. Preprint at <https://arxiv.org/abs/2109.14450>.
- [ICCVW2021] Jeremy Klotz, *Vijay Rengarajan*, and Aswin C. Sankaranarayanan. “Fine-Grain Prediction of Strawberry Freshness using Subsurface Scattering” in Large-Scale Fine-Grained Food Analysis Workshop at ICCV 2021.
- [CVPRW2020] *Vijay Rengarajan*, Shuo Zhao, Ruiwen Zhen, John Glotzbach, Hamid Sheikh, and Aswin C. Sankaranarayanan. “Photosequencing of Motion Blur using Short and Long Exposures,” in New Trends in Image Restoration and Enhancement workshop at CVPR 2020 (oral presentation).
- [ICIP2018] Nimisha T M, *Vijay Rengarajan*, and A.N. Rajagopalan. “Semi-supervised Learning of Camera Motion from a Blurred Image,” in International Conference on Image Processing (**ICIP**), October 2018 (oral presentation).
- [CVPR2017] *Vijay Rengarajan*, Yogesh Balaji, and A.N. Rajagopalan. “Unrolling the Shutter: CNN to Correct Motion Distortions,” in International Conference on Computer Vision and Pattern Recognition (**CVPR**), July 2017 (oral presentation).
- [TPAMI2017] *Vijay Rengarajan*, A.N. Rajagopalan, R. Aravind, and Guna Seetharaman. “Image Registration and Change Detection under Rolling Shutter Motion Blur,” IEEE Transactions on Pattern Analysis and Machine Intelligence (**PAMI**), November 2016.

9. [ICIP2016] *Vijay Rengarajan*, Abhijith Punnappurath, and A.N. Rajagopalan. "Rolling Shutter Super-resolution in Burst Mode," in International Conference on Image Processing (ICIP), September 2016.
10. [CVPR2016] *Vijay Rengarajan*, A.N. Rajagopalan, and R. Aravind. "From Bows to Arrows: Single Image Rolling Shutter Rectification," in International Conference on Computer Vision and Pattern Recognition (CVPR), June 2016.
11. [ICCV2015] Abhijith Punnappurath, *Vijay Rengarajan*, and A.N. Rajagopalan. "Rolling Shutter Super-resolution," in the Proceedings of IEEE International Conference on Computer Vision (ICCV), December 2015.
12. [SPIE2015] *Vijay Rengarajan*, Sheetal B. Gupta, A.N. Rajagopalan, and Guna Seetharaman. "Illumination Robust Change Detection with CMOS Imaging Sensors," in SPIE Defense + Security Symposium, International Society for Optics and Photonics, April 2015 (oral presentation).
13. [ECCV2014] *Vijay Rengarajan*, A.N. Rajagopalan, and R. Aravind. "Change Detection in the Presence of Motion Blur and Rolling Shutter Effect," in European Conference on Computer Vision (ECCV), Springer International Publishing, September 2014.
14. [ICPR2014] *Vijay Rengarajan*, A.N. Rajagopalan, and R. Aravind. "Motion Estimation and Classification in Compressive Sensing from Dynamic Measurements," in the Proceedings of IEEE International Conference on Pattern Recognition (ICPR), August 2014 (oral presentation).
15. [CVPRW2014] *Vijay Rengarajan*, Abhijith Punnappurath, A.N. Rajagopalan, and Guna Seetharaman. "Efficient Change Detection for Very Large Motion Blurred Images," in the Proceedings of IEEE Conference on Computer Vision and Pattern Recognition Workshop on Registration of Very Large Images, June 2014 (oral presentation).

PROJECTS

On-Device AI for Camera Pipeline at Reality Labs, Meta.

- Developing machine learning models for different modules in the camera pipeline.

Deep Intermodal Video Analytics (DIVA) with Prof. Aswin Sankaranarayanan (ECE, CMU) and Prof. Deva Ramanan (RI, CMU).

- Developed a surprise activity detection system which detects unknown activities in unknown capture environments using only a few query example activities revealed at run-time as a surprise.

AWARDS

Travel Grant from Google India Pvt. Ltd. to travel to the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2017 held at Honolulu, USA.

Doctoral Consortium Participation and Travel Award for the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2016.

Institute Research Scholar Award for excellence in research awarded by Indian Institute of Technology Madras in April 2015.

ACADEMIC ACTIVITIES

Reviewer for the following journals and conferences:

Transactions on Image Processing, Transactions on Multimedia, Transactions on Computational Imaging, CVPR 2018–19, 2021–23, WACI 2022, ECCV 2020, AAAI 2020, ICCV 2019, ACCV 2018, NeurIPS 2016, WACV 2016–2019, and ICVGIP 2016.

Teaching Assistant, Indian Institute of Technology Madras August 2011 – July 2017
Assisted in preparing and conducting lab assignments and class tutorials for the following courses: *Image Signal Processing*, *Digital Signal Processing*, *Probability Foundations*, and *Computational Photography*.

SOCIAL ACTIVITIES

Founder of *Vannam* (meaning color), LGBTQIA+ student support group of Indian Institute of Technology, Madras.