PRASANNA REDDY PULAKURTHI

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EDUCATION

Rochester Institute of Technology   Rochester, NY
Doctor of Philosophy (Ph.D.) – Electrical and Computer Engineering | GPA: 3.93/4.0   *Aug 2019 – Present*

Rochester Institute of Technology   Rochester, NY
Master of Science (MS) – Electrical Engineering | GPA: 4.0/4.0   *Aug 2017 – July 2019*

PESIT Bangalore South Campus   Bangalore, India
Bachelor of Engineering (BE) – Electronics and Communications Engineering   *Aug 2013 – June 2017*

WORK AND RESEARCH EXPERIENCE

Qualcomm Internship – Virtual Reality Team
Engineering Intern   *May 2021 – Aug 2021*

- Developed a temperature compensation algorithm for the 6DOF 4Tx ultrasound VR controller.
- Implemented the algorithm in C, improving the root mean squared error (RMSE) by 11.29% on synthetic log data.

Microsoft Internship – Iris Recognition Team for HoloLens 2
Engineering Intern   *May 2020 – Aug 2020*

- Improved the image processing pipeline for Iris Recognition by optimizing the frequencies of Gabor filters, which enhanced the uniqueness of the output signature.
- Devised a Super Resolution Network (SRN) using Generative Adversarial Networks (GANs), which improved the image quality while being optimized to retain the Gabor Frequencies of Interest. This ensured that Iris Recognition Accuracy was maintained even for lower-quality images.

Oak Ridge National Laboratory
Research Assistant   *May 2018 – July 2019*

- Designed and executed an unmanned aerial system (UAS) data collection to capture aerial imagery of a building casting shadows on 14 differently colored panels, both in and out of shadow. ↗
- Developed six algorithms for shadow detection in aerial images using color transforms and machine learning techniques, leveraging the collected data.
- One of the developed chromaticity algorithms improved upon traditional chromaticity approaches by 1.51% in accuracy and 2.4% in F-score.

TECHNICAL SKILLS

- **Languages**: C, Python (NumPy, Pandas, PyTorch, TensorFlow, OpenCV, Matplotlib), HTML, CSS
- **Image Processing Tools & Deep Learning Libraries**: Pytorch, TensorFlow, Keras, Scikit-Learn, DIRSIG, ENVI, Adobe Photoshop
- **Tools and Libraries**: MATLAB, Microsoft suite, Docker

PUBLICATIONS AND INVITED TALKS

Research Publications

1. **Prasanna Reddy Pulakurthi**, Majid Rabbani, Jamison Heard, Sohail Dianat, Celso M. de Melo, and Raghuveer Rao, "Shuffle PatchMix Augmentation with Confidence Margin Weighted Pseudo Labels for Enhanced Source-Free Domain Adaptation," submitted to *ICIP 2025-2025 IEEE International Conference on Image Processing (ICIP)*. IEEE, 2025.

2. **Prasanna Reddy Pulakurthi**, Mahsa Mozaffari, Sohail Dianat, Jamison Heard, Raghuveer Rao, and Majid Rabbani, "Enhancing GANs with MMD Neural Architecture Search, PMish Activation Function and Adaptive Rank Decomposition," *IEEE Access*, 2024, doi: 10.1109/ACCESS.2024.3485557. ↗

3. **Prasanna Reddy Pulakurthi**, Celso M De Melo, Raghuveer Rao, and Majid Rabbani, "Enhancing human action recognition with GAN-based data augmentation," *Synthetic Data for Artificial Intelligence and Machine Learning: Tools, Techniques, and Applications II*. Vol. 13035. SPIE, 2024. ↗

4. **Prasanna Reddy Pulakurthi**, Mahsa Mozaffari, Sohail A. Dianat, Majid Rabbani, Jamison Heard, and Raghuveer Rao, "Enhancing GAN Performance through Neural Architecture Search and Tensor Decomposition," *ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2024. ↗

5. **Prasanna Reddy Pulakurthi**, Sohail A. Dianat, Majid Rabbani, Suya You, and Raghuveer M. Rao, "A globally optimal fast iterative linear maximum likelihood classifier" in *Electronic Imaging*, 2023, pp 172-1 - 172-5. ⎘

6. **Prasanna Reddy Pulakurthi**, Sohail A. Dianat, Majid Rabbani, Suya You, and Raghuveer M. Rao, "Unsupervised domain adaptation using feature aligned maximum classifier discrepancy," *Proc. SPIE 12227, Applications of Machine Learning 2022*, 1222707 (3 October 2022). ⎘

7. **Prasanna Reddy Pulakurthi**, "Shadow Detection in Aerial Images using Machine Learning" (2019), Thesis, Rochester Institute of Technology. ⎘

Workshops

1. Sohail Dianat, **Prasanna Reddy Pulakurthi**, Suya You, and Raghuveer M. Rao, "Domain Adaptation using Maximum Mean Discrepancy," poster presented at 2021 Western New York Image and Signal Processing Workshop. ⎘

2. **Prasanna Reddy Pulakurthi**, and Emmett Ientilucci (2019, Feb), "Shadow Detection in Aerial and UAS data Using Neural Networks," presented a talk at STRATUS 2019 Workshop, Rochester, NY, (2019). ⎘

Invited Talks

1. Majid Rabbani and **Prasanna Reddy Pulakurthi**, "Super-Resolution: Computational and Deep Learning-Based Approaches," co-presented a talk at the Society for Imaging Science and Technology (IS&T) Rochester NY chapter. ⎘

2. Raghuveer Rao, **Prasanna Reddy Pulakurthi**, Sohail A. Dianat, invited guest talk at IEEE CIS and C Lecture on "Advancements and Applications of Generative Adversarial Networks." ⎘

PROJECTS

Automatic Attendance Update System using Image Processing ⎘

- A complete working model for an automatic attendance system was developed, utilizing face detection and recognition. Face detection was performed using the open-source library OpenCV, and the "Binarized Statistical Image Features" algorithm was implemented in Python for face recognition.

- The system featured a user-friendly GUI to display attendance on a website (hosted using APACHE), accessed via an attendance app created with KIVY. The app was connected to a server using sockets and PHP, with data stored in a MySQL database. The project aimed to automate face detection and recognition to mark attendance.

Machine Learning and Deep Learning Projects

- Generative Adversarial Networks (GANs) were applied in domain adaptation, image-to-image translation, and human action recognition tasks. Invertible Neural Networks (INNs) were utilized to perform super-resolution and image denoising.

- Stock price prediction was conducted using Stacked LSTMs in Keras.

- A snake game was developed using Q-learning techniques.

- A story generator was built using Recurrent Neural Networks (RNNs) in Keras.

Image and Signal Processing Projects

- An automatic number plate detection and recognition system was implemented using edge and histogram-based image processing methods for detection and neural networks for recognition, coded in MATLAB. ⎘

- A thorough understanding of several image and signal processing concepts, such as image resizing, noise filtering, image enhancement, image segmentation, camera calibration, stereo reconstruction, affine, and projective transforms, was developed, and these concepts were implemented using MATLAB.

COURSEWORK

- **Signal & Image Processing**: Digital Signal Processing (EEE678), Digital Image Processing (EEE779), Multi-view Imaging (IMGS712)
- **Machine Learning**: Machine Learning, Deep Learning Independent Study (EEE799), AI Explorations (EEE 647), Pattern Recognition (EEE670)
- **Communications**: Information Theory Coding (EEE794), Image and Video Compression (EEE781)
- **Machine Learning Course**: Machine Learning by Stanford University on Coursera