

Paras Maharjan

Open to self-relocating | paras.maharjan@mail.umkc.edu | +1(816) 605-2910

Paras Maharjan - Google Scholar | linkedin.com/in/parasmaharjan | github.com/parasmaharjan

Skills

Languages: Python, MATLAB, C/C++

Framework: PyTorch, TensorFlow, ONNX, TensorRT, Numpy, Scikit-Learn, OpenCV, MATLAB's Neural Network Toolbox, CUDA

Tools: FFmpeg, VVC VTM, VVenc/VVdec, Git, ~~TeX~~TeX, Unix/Linux, TMUX, Docker, ssh, VSCode, MeshLab

Technologies: Image/Video Processing, Image/Video Compression, Information Theory and Coding, Computer Vision, Deep Learning, Machine Learning, Large Language Model, Generative AI, Diffusion model

Education

University of Missouri-Kansas City

Expected July 2025

Ph.D. in Electrical and Computer Engineering (GPA: 4.0/4.0)

Experience

Intern Research Scientist

Feb 2024 – Present

Atombeam Technologies – Moraga, CA (Startup)

- Architected a transform-domain end-to-end image compression solution utilizing deep learning techniques for complex-valued SAR images, achieving a 28% reduction in inference time.
- Optimized channel context modeling through feature grouping based on latent energy, leading to a 26.5% BD-rate improvement over VVC/H.266-based SAR image compression.

Graduate Research Assistant

June 2018 – Present

Multimedia Computing and Communication Lab, UMKC – Kansas City, MO

- Designed a residual learning-based deep neural network for extreme low-light denoising, achieving a $29\times$ speedup with improved reconstruction performance.
- Designed a deep learning-based SAR deblocking network to mitigate compression artifacts introduced by the HEVC/H.265 and VVC/H.266 compression engine for complex-valued SAR images, achieving 10% bitrate savings compared to baseline.
- Devised a distributed polarimetric SAR compression and deblocking network that utilizes side information for efficient compression and artifact removal, attaining 37% bitrate saving over the VVC/H.266 codec while preserving polarimetric features.

Video Processing Research Intern

May 2022 – Aug 2022

Dolby Labs – Sunnyvale, CA

- Formulated a local gamma correction algorithm for adaptive face brightness adjustment in video conferencing scenarios.
- Developed a machine learning-driven technique to determine the optimal tuning parameter for background exposure correction.

Research Intern of Image/Video Algorithms

Jun 2021 – Aug 2021

Kuaishou Technology – Palo Alto, CA

- Constructed a deep neural network for image deblocking and deblurring, leveraging DCT decomposition for enhanced transform-domain processing.

Research Intern of Image/Video Algorithms

Sept 2020 – Jan 2021

Kuaishou Technology – Palo Alto, CA

- Proposed a dual-input-dual-output network with a dual loss function that processes noisy raw and ISP-processed noisy sRGB images to generate clean sRGB outputs.

Image Processing Engineering Intern**Jun 2020 – Sept 2020**

Dolby Labs – Burbank, CA

- Accelerated real-time sports recognition and image segmentation using deep neural networks, achieving a 3× speedup for sports recognition and a 30% improvement in segmentation.

Camera Design Intern**May 2019 – Aug 2019**

Poly Inc. (Previously Polycom) – Austin, TX

- Prototyped multi-camera image fusion techniques to improve image quality in real-time applications.
- Developed an algorithm for multi-camera systems incorporating geometric calibration, image registration (SIFT), parallax correction, and alpha fusion-based blending for seamless video transitions.

Embedded Firmware Designer**June 2016 – Aug 2017**

Temco Controls Nepal – Lalitpur, Nepal

- Researched on an underwater navigation system utilizing sensor fusion between a velocity sensor and an IMU.
- Designed firmware for thermostat with data-logging and location-based online weather acquisition.

Embedded Firmware Designer**Oct 2014 – May 2016**

Real Time Solutions Pvt. Ltd. – Lalitpur, Nepal

- Worked with ICIMOD to set up first air quality monitoring station in Nepal and Bhutan.
- Designed firmware for the data acquisition system, supervised system installation process and provided the technical support for the data interpretation.

Publications

Paras Maharjan, Zhu Li, Chris McGuinness, "Amplitude, Phase and Gradient Recovery from Compressed SAR Images", *Submitted to IEEE Transactions on Circuits and Systems for Video Technology (TCSVT) [Under Review]*.

Paras Maharjan, Zhu Li, "Distributed Polarimetric SAR Compression with Joint Deblocking Using Side Information", *2025 IEEE International Symposium on Circuits and Systems (ISCAS 2025)*.

Paras Maharjan, Corey Marrs and Zhu Li, "End-to-End Compression of Complex-Valued SAR Images", *2024 IEEE 26th International Workshop on Multimedia Signal Processing (MMSP 2024)*.

Paras Maharjan, Zhu Li, "Complex-valued SAR Image Compression: A Novel Approach for Amplitude and Phase Recovery", *2023 International Conference on Visual Communications and Image Processing (VCIP 2023)*

Paras Maharjan, Lyle Vanfossan, Zhu Li, Jerry Jialie Shen, "Fast LoG SIFT Keypoint Detector", *2023 IEEE 25th International Workshop on Multimedia Signal Processing (MMSP 2023)*.

Paras Maharjan, Zhu Li, Ning Xu, Xuan Xu, Yuyan Song, "DCTResNet: Transform Domain Image Deblocking for Motion Blur Images", *2021 International Conference on Visual Communications and Image Processing (VCIP 2021)*.

Paras Maharjan, Zhu Li, Ning Xu, Chongyang Ma, Li Li, Yue Li, "Improving Extreme Low-Light Image Denoising via Residual Learning", *2019 IEEE International Conference on Multimedia and Expo (ICME 2019)*.

Patents (10+ granted)

Paras Maharjan, Zhu Li, Brian Galvin, "Controllable lossy compression system using joint learning", *US Patent 12199643*

Paras Maharjan, Zhu Li, "Systems and methods for neural network based data compression", *US Patent: 12224777*

Paras Maharjan, Zhu Li, "Real time discrete cosine transform image and video processing with convolutional neural network architecture", *US Patent: 12198304*

Paras Maharjan, Tsung-Wei Huang, Guan-Ming Su, "Adaptive face brightness adjustment for images and video", *Worldwide Patent: WO2024112375A1*

Paras Maharjan, Zhu Li, "System and method for learning-based lossless data compression", *US Patent: 12119848*

Paras Maharjan, Ning Xu, Xuan Xu, Yuyan Song, "Methods and devices for joint sensor and pixel domain denoising", *US Patent: 11967047*