

Paras Maharjan

Research Scientist

Open to self-relocate | paras.maharjan@mail.umkc.edu | 8166052910 | Google Scholar | LinkedIn | GitHub

Website

Skills

Languages: Python, MATLAB, C/C++

Framework: PyTorch, TensorFlow, Numpy, Scikit-Learn, OpenCV, CUDA

Tools: FFmpeg, VVC VTM, VVenc/VVdec, Git, \LaTeX , Unix/Linux, TMUX, Docker, ssh, VSCode

Technologies: Image/Video Processing, Image/Video Compression, Image analysis, Image Signal Processors(ISP), Computer Vision, Deep Learning, Machine Learning, Denoising, Deblurring, Super-resolution, Statistical analysis

Education

University of Missouri-Kansas City

Completed July 2025

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

Dissertation - *Complex-valued SAR Image Compression: An Approach for Amplitude, Phase, and Gradient Recovery*

Experience

AI/ML Computer Vision Research Intern

Sept 2025 - Nov 2025

Sony Corporation of America – San Jose, CA

- Working on solving computer vision problem using AI/ML.

Intern Research Scientist

Feb 2024 – July 2025

Atombeam Technologies – Moraga, CA

- Architected an end-to-end **image compression** solution utilizing a machine learning approach 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 – July 2025

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.
- Developed a camera pipeline for learning-based dark **image enhancement** with **white balance correction** and **color tuning**, applying denoising before ISP and separately learning low- and high-frequency components.

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 **automatic 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.
- Performed objective and subjective **image quality assessment** for generated output images, achieving a 3% improvement in PSNR with real-time performance.

Research Intern of Image/Video Algorithms

Sept 2020 – Jan 2021

Kuaishou Technology – Palo Alto, CA

- Implemented deep learning-based **image denoising** techniques for real-world noisy images.
- 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 **video understanding** 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.

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 (Arm Cortex M3) for a thermostat with **data-logging** and location-based online weather acquisition.

Firmware Designer

Oct 2014 – May 2016

Real Time Solutions Pvt. Ltd. – Lalitpur, Nepal

- Worked with ICIMOD to set up the first **air quality monitoring station** in Nepal and Bhutan.
- Designed firmware(Arm Cortex M4) for the **data acquisition system**, supervised the system installation process, and provided technical support for the data interpretation.

Publications

Amplitude, Phase, and Gradient Recovery from Compressed SAR Images, TCSVT [Under Review]

Distributed Polarimetric SAR Compression with Joint Deblocking Using Side Information, ISCAS (2025)

End-to-End Compression of Complex-Valued SAR Images, MMSP (2024)

E2SIFT: Neuromorphic SIFT via Direct Feature Pyramid Recovery from Events, ICIP (2024)

Complex-valued SAR Image Compression: A Novel Approach for Amplitude and Phase Recovery, VCIP (2023)

Fast LoG SIFT Keypoint Detector, MMSP (2023)

Dct-based residual network for nir image colorization, ICIP (2022)

DCTResNet: Transform Domain Image Deblocking for Motion Blur Images, VCIP (2021)

Improving Extreme Low-Light Image Denoising via Residual Learning, ICME (2019)

Patents (15+ granted)

Systems and methods for synthetic aperture radar image compression, *US Patent: 12392891*

System and method for federated two-stage compression with federated joint learning, *US Patent: 12373739*

Distributed system and method for adaptive neural network-based data compression, *US Patent: 12375101*

System and method for hyperspectral image generation with quality assurance, *US Patent: 12322070*

Upsampling of compressed financial time-series data using a jointly trained Vector Quantized Variational Autoencoder neural network, *US Patent: 12229679*

System and methods for upsampling of decompressed genomic data after lossy compression using a neural network, *US Patent: 12224044*

Controllable lossy compression system using joint learning, *US Patent: 12199643*

Systems and methods for hyperspectral image generation, *US Patent: 12190573*

Upsampling of decompressed financial time—series data using a neural network, *US Patent: 12093972*

System and methods for upsampling of decompressed genomic data after lossy compression using a neural network, *US Patent: 12095484*

System and methods for upsampling of decompressed time-series data using a neural network, *US Patent: 12068761*

Systems and methods for neural network based data compression, *US Patent: 12224777*

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

Adaptive face brightness adjustment for images and video, *Worldwide Patent: WO2024112375A1*

System and method for learning-based lossless data compression, *US Patent: 12119848*

Methods and devices for joint sensor and pixel domain denoising, *US Patent: 11967047*