

Shaurya Dewan

[Website](#) | [Linkedin](#) | [Github](#) | [Google Scholar](#) | P: +1 (412) 287-8594 | srdewan@andrew.cmu.edu

EDUCATION

CARNEGIE MELLON UNIVERSITY

Master of Science in Computer Vision | GPA: 4.00 / 4.00

Coursework: Deep Learning Systems, Multimodal Machine Learning (Ongoing), Learning for 3D Vision (Ongoing)

Pittsburgh, PA
Dec 2024

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY - HYDERABAD

Bachelor of Technology (Honours) in Computer Science and Engineering | CGPA: 9.12 / 10.00

Teaching Assistantships: Automata Theory, Mobile Robotics

Coursework: Machine Data and Learning, Digital Image Processing, Computer Vision, Statistical Methods in AI

Hyderabad, India
May 2023

RESEARCH

Physical Perception Lab @ CMU | Prof. Shubham Tulsiani

Nov 2023 – Present

Generalizable 3D Gaussian Splatting in the Sparse Setting (Ongoing)

- Currently leading a project on learning a model that can predict attributes of 3D gaussians in a single-forward pass without any optimization for a new scene at inference from sparse data (4-5 views) such that these gaussians can be rendered from any novel view.

Robotics Research Center @ IIIT-H | Prof. Madhava Krishna

May 2021 – May 2023

Canonical Fields: Self-Supervised Learning of Pose-Canonicalized Neural Fields ([Project Page](#)) | Brown University

- Published a CVPR 2023 highlight paper as a co-first author in collaboration with Brown University (Prof. Srinath Sridhar) to develop a pipeline, CaFi-Net, for self-supervised canonicalization of NeRF-generated fields in PyTorch-lighting.
- Created a dataset of 1300 trained NeRF models. This involved designing a Blender-based simulator to capture images of ShapeNet models, experimenting with the NeRF codebase to obtain clean models, and sampling the density fields from the trained models.
- Extended the notion of equivariance to and enabled the operation of 3D point cloud networks on NeRFs.
- This pipeline employed NeRFs, Tensor Field Networks (TFNs), spherical harmonics, and MLPs.

Pose-Shape Optimizer Pipeline ([Code](#))

- Recreated a pipeline in MATLAB and Ceres that reconstructs and localizes a vehicle in 3D given a monocular 2D image.
- This involved deforming a 3D wireframe (obtained from vehicle shape priors using PCA) by estimating and optimizing for the pose and shape deformation such that the wireframe aligned with the vehicle's key points when reprojected to 2D.
- Further applied multi-view optimization over the shape to stabilize it across sequences of video frames.
- Made use of a deep stacked hourglass CNN model to estimate vehicle key points in the images.

Precog Research Group @ IIIT-H | Prof. Ponnunrangam Kumaraguru

Jan 2022 – Dec 2022

Synthetic Data Generation | Infosys

- Assembled a relationship-preserving multi-table synthetic data generation system using a hierarchy-preserving variant of CTGAN from the SDV framework in Python which has since been integrated into the Infosys Enterprise Data Privacy Suite (iEDPS). Employed classification and regression models such as Random Forest, Lasso, Ridge, etc. to model and enforce relationships between attributes.

SACH Fact Check Search Engine | Factly

- Collaborated with Factly on analyzing and improving the reverse image search pipeline within their fact check search engine.
- Established performance metrics of the existing search pipeline, compared it with other baselines such as image hashing methods, and experimented with various image preprocessing methods such as text removal and OCR to improve the pipeline.

WORK EXPERIENCE

Virtual Labs

Hyderabad, India | Remote

Software Engineer Intern

May 2021 – Jul 2021

- Designed an experiment template in HTML, CSS, and JavaScript for reuse by other developers and built 10 experiments of the [Soil Mechanics Lab](#) which became the third-most viewed IIIT-H lab for the past 2 years with 1.2 million views.

PROJECTS

Editing Segmented Objects in 3D Gaussian Splatting (Ongoing) | CMU

Feb 2023 - Present

- Developing an extension of [LangSplat](#) to enable editing of a segmented object's appearance from text prompts by optimizing the gaussians' learnt CLIP embeddings. We learn to predict a gaussian's RGB properties from these embeddings to allow editing.

Interpretability of Diffusion Models (Ongoing) | CMU

Feb 2023 - Present

- Currently working to make diffusion models interpretable using circuit probing and by comparing the structural similarities between the visual (generated) and textual (prompt) latent spaces. Also considering applying information decomposition methods.

Needle Deep Learning Library ([Code](#)) | CMU

Sep 2023 - Dec 2023

- Developed a PyTorch-like Deep Learning library from scratch including auto differentiation and CUDA programming of linear operations such as matrix multiplication, transpose, convolution, etc. This library includes all the essential components required to build fundamental Deep Learning models, some of which (CNN, LSTM, Transformer, etc.) have been demonstrated in the codebase.

TECHNICAL SKILLS AND CERTIFICATIONS

Languages: Python, C++, C, MATLAB, R, Octave, Bash, x86

Web Technologies: HTML5, CSS, JavaScript, React, GraphQL

Libraries: PyTorch, OpenCV, Open3D, scikit-learn, Pandas

Tools: Blender, Anaconda, Jupyter, Git, Postman, Latex

Databases: MongoDB, SQL

Certifications: 6th Summer School on AI by CVIT @ IIIT-H