Rhitvik Sinha

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Education

Courant Institute of Mathematical Sciences, New York University — New York, NY
Master of Science in Computer Science — *2022 - 2024*

Indian Institute of Technology, Kharagpur — Kharagpur, India
Bachelor of Technology (Honours) in Electrical Engineering — *2018 - 2022*

Delhi Public School, R. K. Puram — New Delhi, India
High School — *2016 - 2018*

Projects

Optimizing Diffusion Models for Image De-Noising — Fall 2022
Course Project (CSCI-GA 2565 Machine Learning), Guide: Prof. Rajesh Ranganath — *NYU*

- Reviewed literature on generative models (VAEs, GANs etc), with special emphasis on diffusion models.
- Reproduced results from Denoising Diffusion Probabilistic Model (DDPM) to set benchmark results.
- Modified pre-trained diffusion models to accept noisy images as input, and reported effect of input noise level, diffusion input step and diffusion cycles on the de-noising output of DDPM.
- Designed a custom class conditional DDPM for missing pixel imputation; achieved similar images to benchmark.

Deep Learning for Extreme Weather Forecasting — Spring, Fall 2021
Undergraduate Research, Guide: Prof. Adway Mitra — *IIT Kharagpur*

- Performed literature review, with specific focus on Capsule Neural Networks and Analog Weather Forecasting.
- Used surface temperature (T2m) and geopotential height at 500 mbar (Z500) (from the NCAR CESM-LENS datatset) to make analogous predictions of the onset of heat/cold waves over North America, 1-5 days ahead.
- Observed that CapsNets outperformed CNNs and logistic regression; confirmed trends observed in the paper 'Analog Forecasting of Extreme-Causing Weather Patterns Using Deep Learning' (2020, Chattopadhyay et al.)

Experience

Transformational AI Intern — Fall 2021
Ministry of Electronics and Information Technology (MeITy), Govt. of India — *New Delhi, India*

- Worked directly under the supervision of Mrs. Kavita Bhatia (Senior Director, MeITy), on Transformational AI projects in the Health Sector, as part of Ministry's Digital India Internship Scheme (2021).
- Landscaped and reviewed the ecosystem and policies operating at the intersection of AI and healthcare in India.

Deep Learning Intern — Summer 2021
Kabuni Ventures Ltd. — *(Virtual) London, UK*

- Applied pre-trained Deep Learning models for the Human Pose Estimation (HPE) task. Used extracted Pose Information to suggest improvements in a Cricket (Sport) Learner's technique, preventing inefficiency and injuries.
- Fine-tuned Torchvision's KeypointRCNN class for best accuracy in the HPE task.
- Outputs from KeypointRCNN used to generate sequential pose data from video clips.
- Trained sequence models to detect potential errors in pose and technique from generated data.

Autonomous Robotics and AI Intern — Summer 2020
Ottonomy IO — *(Virtual) Dover, DE*

- Assisted with the automation of last mile delivery through self-driving rovers that operate on sidewalks.
- Set up cloud-based training and deployment pipelines for Deep Learning frameworks (TensorFlow, PyTorch) utilizing AWS services: S3, EC2, SageMaker.

Technical Skills

Programming Languages: Python, MATLAB, R, C++, JavaScript, Scala, Java
Python Frameworks: PyTorch, Numpy, Matplotlib, TensorFlow 2.x, Scikit-Learn, Pandas, OpenCV
Developer Tools: Git, Docker, AWS, Google Cloud Platform, VS Code