Lalit Bhagat

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EDUCATION

University of California - Los Angeles (UCLA) **Dec 2023**
Master of Science in Computer Science GPA: 4.0/4.0

- Awarded Graduate Council Diversity Fellowship

Jaypee Institute of Information Technology (JIIT) **May 2021**
B. Tech in Computer Science and Engineering with Honours GPA: 8.7/10

RESEARCH INTERESTS

Generative AI, Human-AI interaction, Adversarial Robustness, AI for Climate Change, Computer Vision, Cognitive Psychology

INDUSTRY EXPERIENCE

Amazon Science **Jan 2023 – Present**
Applied Scientist *Seattle, WA*

- Developing a transformer based ML model for actionable insights of customers

Amazon Science **Jun 2022 – Sep 2022**
Applied Scientist Intern *Seattle, WA*

- Developed Payment Intelligent Embedding Representation (PIER) for Amazon customer data
- Implemented VAE, leading to an 83% reduction in storage costs and reducing training time by 75%
- Designed PIER to make payment data accessible to internal teams without privacy issues

RESEARCH EXPERIENCE

Zhou Lab at UCLA **July 2023 – Dec 2023**
Research Assistant | Advisor: Bolei Zhou *Los Angeles, CA*

- Improved spatial steerability of GANs without searching for steerable directions in the latent space or requiring extra annotation
- Developed a user interface enabling user to edit the output image by adjusting the scene layout, moving, or removing objects
- Integrated DragGAN to enable fine-grained manipulation efficiently, supporting a step-by-step coarse-to-fine editing approach

UCLA Computational Machine Learning Lab **Oct 2022 – June 2023**
Masters Thesis | Advisor: Cho-Jui Hsieh *Los Angeles, CA*

- Developed a Parameter-free Adversarial Attack via Learned Optimizer using meta learning
- Achieved better l-inf norm 8/255 attack accuracy than PGD when tested on robust models trained on MNIST dataset

NeWS Lab, Indian Institute of Technology Hyderabad **Jun 2020 – Aug 2021**
Research Intern | Advisor: Antony Franklin *Hyderabad, India*

- Designed a Multi-neural network based tiled 360°video caching solution with Mobile Edge Computing
- Implemented asynchronous actor-critic (A3C), CNN, LSTM, LFU and LRU algorithms for caching of tiles in 360° video
- Evaluated proposed framework through simulations with real-world head-movement traces, enhanced user experience
- Improved cache hit rate by 10% and reduced end-to-end latency along with back-haul usage by at least 35%

Gurugram Police **Jun 2020 – Jul 2020**
Cyber Security Intern *Remote*

- Developed a mobile camera application to prevent the saving and sharing of inappropriate images, to curb cybercrime.
- Designed an ML model and integrated it client-side to mitigate security breaches often resulting from API calls.

Jaypee Institute of Information Technology **Sep 2019 - May 2020**
Research Assistant | Advisor: Dinesh C. S. Bisht *Noida, India*

- Developed a Hybrid Adaptive Time Variant Fuzzy Time Series model with Genetic Algorithm
- Implemented Genetic Algorithms for selection and optimization of fuzzy intervals in Fuzzy Time Series
- Evaluated model on real-time Air Quality Index data of 2 cities, improved the RMSE by at least 2 units

PUBLICATIONS

Obscene Image Excluder | *App. No:* 202011041018 | https://ipindiaservices.gov.in/publicsearch **10/23/2020**

- Indian **Patent** (published) | Name of Inventors: **Lalit Bhagat**, Nancy Sharma, Himani Bansal, Kanchan Hans

Wang, J.*, **Bhagat, L.*** Yang, C., Xu, Y., Shen, Y., Li, H., & Zhou, B. (2023). **Spatial Steerability of GANs via Self-Supervision from Discriminator.** arXiv preprint arXiv:2301.08455. Submitted IEEE Transactions on Pattern Analysis and Machine Intelligence **(TPAMI)**

Kumar, S., **Bhagat, L.**, Franklin A, A., and Jin, J., **Multi-neural network based tiled 360°video caching with Mobile Edge Computing**, Journal of Network and Computer Applications **(JNCA)**, 2022, 103342, ISSN 1084-8045**[SCI IF: 7.57]**

Bhagat, L. (2023). Parameter-free Adversarial Attack via Learned Optimizer (Masters thesis, University of California, Los Angeles).

Bansal H., **Bhagat L.**, Mittal S., Tiwari A. (2021) **Image Correction and Identification of Ishihara Test Images for Color Blind Individual.** Proceedings of Second International Conference on Computing, Communications, and Cyber-Security. Lecture Notes in Networks and Systems, vol 203. Springer, Singapore. **[SCOPUS] [DBLP]**

Bhagat, L. et al. (2021), **Air quality management using genetic algorithm based heuristic fuzzy time series model**, The TQM Journal, Vol. ahead-of-print No. ahead-of-print. **[SCOPUS]**

TEACHING

Machine Learning, Teaching Associate, UCLA **Fall 2023**

MATLAB Programming, Teaching Associate, UCLA **Summer 2023**

Advanced MATLAB Programming, Teaching Associate, UCLA **Winter 2023**

SQL and Basic Data Management, Teaching Assistant, UCLA **Fall 2022**

MATLAB Programming, Teaching Assistant, UCLA **Spring 2022**

Cognitive Psychology, Teaching Assistant, UCLA **Winter 2022**

PROJECTS

High-resolution weather forecasting via downscaling | *AI for Climate Change* **Fall 2022**

- Proposed a novel joint training framework for weather forecasting and downscaling, which improves the accuracy and resolution of climate predictions.
- Showed that the joint framework outperforms isolated high-resolution forecasting models

SketcHTML - An interactive sketch to HTML converter | *CS 269 UCLA* **Spring 2022**

- Developed an innovative "no-code" tool for creating HTML web pages from hand-drawn sketches
- Extended software to generate Web-UI images to create an enhanced dataset and achieved better performance
- Improved upon existing applications by allowing more variations in the layouts and an interactive tool for styling

Daltonism | *Minor Project* | *Image Processing* | *OpenCV* **Jan 2020 – May 2020**

- Developed a mobile application for color the deficient patients, to help them perceive colors they normally can't see.
- Implemented image processing techniques for mapping of images to different color spectrum that falls in visible spectrum

Clustering of Air Objects and Trajectory Prediction | *Team Lead, Smart India Hackathon* **Jan 2020 – May 2020**

- Extracted features like max velocity, max altitude, drop in altitude, etc. from 4D trajectory of air objects
- Applied K-means algorithm on extracted features for clustering of air objects - Airplane, Missile and Drop Bomb
- Achieved a R2 score of 99.5 by training separate LSTM models on each air object cluster. Airplane data set: NASA

TECHNICAL SKILLS

C, C++, Python(Pytorch, Tensorflow) , MATLAB, SQL, Linux