Muskan Lalit

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EDUCATION

University of Southern California, Viterbi School of Engineering	**Los Angeles, CA**
Master of Science in Computer Science (Honors Student)	Aug 2022-May 2024
Coursework: Analysis of Algorithms, Game Engine Development, Machine Learning, Multimedia Systems Design	GPA: 4/4

Indira Gandhi Delhi Technical University for Women	**Delhi, India**
Bachelor of Technology in Computer Science and Engineering	Aug 2018-May 2022
Received: Anita B.org Grace Hopper Celebration Scholarship (2021), Mitacs Global Research Scholarship (2020)	GPA: 8.73/10

SKILLS

- Languages: **C/C++, Python**, **Java, HTML, CSS, JavaScript**, **React.js**, R, SQL, Kotlin, Obj-C, Swift, Lua
- Framework/Libraries/Tools: **Node.js, React Native, TensorFlow, PyTorch, Keras, scikit-learn**, fast.ai, OpenCV, Android Studio, XCode, git, three.js, Django, QuantStats, BeautifulSoup, PyQt, Celery, Redis, Jupyter, Maya, Visual Studio

EXPERIENCE

Animus Technologies — Los Angeles, CA
Software Developer Intern — *June 2023-July 2023*
- Automated the upload/download of holding reports using Google Drive API and Python, resulting in a 20% manual time reduction
- Implemented robust APIs and authentication mechanisms to interact with Google Drive services securely
- Created an HTML strategy sheet based on a detailed backtest tear sheet, providing valuable insights for investment strategies

Semio — Los Angeles, CA
Software Developer Intern — *June 2023-July 2023*
- Developed a multi-attention system with a demo robot hardware platform using 3D rendering in React
- Made an interactive dashboard for the bot using inverse kinematics in virtual space for eyes and TTS for mouth animation

Affective Computing Lab @ USC Institute for Creative Technologies — Los Angeles, CA
HCI Research Intern — *June 2023-Aug 2023*
- Developed a program to analyse synchrony between a human and an AI agent interacting in a video
- Processed the videos using OpenPose and calculated Dynamic Time Warping distances between the two agents in the video

Disney, India - Project — Bangalore, India
Software Development Engineering Intern — *Jan 2022-June 2022*
- Developed a partner device compatibility detector application in the Web Engineering (Consumer Experience) team
- Worked with NodeJS, React Native, Java, Swift, Obj C, XCode, Android Studio to design a cross-platform application
- App checked for 50+ hardware and software device features that saved 1600+ man-hours for debugging in the EMEA launch

University of Regina, Data Science Lab - Projects — Saskatchewan, Canada
Artificial Intelligence Research Intern, under Prof. (Dr.) Alireza Manashty — *May 2021-Aug 2021*
- Designed and developed a personalized LSTM model for time series forecasting of health vitals using Federated Machine Learning
- Achieved average improvement in metrics by 26.39% (MSE), 13.91% (MAPE), 12.15% (SMAPE)
- Worked with Python, PyTorch and authored two research papers during the internship, under review by the lab

University of Waterloo, QuIN Lab - Projects — Ontario, Canada
Artificial Intelligence and Machine Learning Researcher, under Prof. (Dr.) Na Young Kim — *Jan 2021-Jan 2022*
- Completed two computer vision and Python applications for automating analysis for quantum computing experiments
- Used Python, PyQt, TensorFlow, Keras for computer vision application and GUI development

Indian Institute for Information Technology, Allahabad, (IIITA) – Project — Allahabad, India
ML Research Intern, under Prof. (Dr.) Anupam Agrawal — *May 2020-Aug 2020*
- Worked on Early Autism Spectrum Disorder detection in children from EEG signals using Machine Learning
- Developed a model with 98% accuracy using statistical, non-statistical features and genetic algorithms

PROJECTS

Media Player with Video Indexing — April 2023
- Developed an interactive Media player in PyQt with Video indexing of Scenes, Shots, Subshots with close to real-time processing
- Used Video and Audio processing techniques such as scene hue, audio intensities, motion detection to create indexes

Image and Video Classification using Transfer Learning   April 2023
- Created a video classifier for Sports Videos using images and compared performances of active and passive learning
- Used transfer learning with ResNet50, EfficientNetB0, VGG16 to train CNNs that classified videos using moving averages

PrimeEngine – Video Game Engine in C/C++   December 2022
- Created a physics engine with camera culling for improved frame rate and lower CPU processing; used Visual Studio, Maya
- Added audio, collision detection, re-navigation, and animation of various characters in the engine using bounding boxes

Crowd Trajectory Prediction from surveillance videos https://doi.org/10.1016/j.procs.2023.01.207   Final Semester Project
- Published 2 researches; formulated a novel architecture using GANs for crowd trajectory forecasting in public spaces
- Defined an updated SGAN architecture and improved the primary error metrics by 40% compared to SGAN

Security System for public places based on Image Processing https://doi.org/10.1145/3492324.3494173   Jan 2020
- Developed a binary classifier for images of toddlers and pets to create a security application for automating surveillance systems
- Published research; used Keras and TensorFlow backend to achieve an accuracy of ~94% with InceptionResNetV2 and 0.03 loss

PUBLICATIONS

iSGAN: An Improved SGAN for Crowd Trajectory Prediction from Surveillance Videos
Procedia Computer Science, DOI: https://doi.org/10.1016/j.procs.2023.01.207
- Developed an updated GAN architecture using iVGAN (Improved Video GAN) and SGAN (Social GAN) for video frame prediction

Survey of Pedestrian Trajectory Prediction Techniques using Surveillance Videos
Presented in International Conference on Advances in Data Science and Computing Technologies (ADSC) 2022
- Researched and analyzed the state-of-the-art trajectory prediction techniques and highlighted areas for improvement

Recent Trends in Artificial Intelligence for Emotion Detection using Facial Image Analysis
Thirteenth International Conference on Contemporary Computing (IC3 '21). ACM, DOI: https://doi.org/10.1145/3474124.3474205
- Surveyed modern techniques for emotion detection in over 50 deep learning researches and highlighted weaknesses

Comparative Analysis of Pre-Trained Deep Neural Networks for Vision-Based Security Systems on a Novel Dataset
IEEE/ACM International Conference on Big Data Computing, Applications and Technologies. ACM, DOI: https://doi.org/10.1145/3492324.3494173
- Compared multiple binary classifiers and achieved an accuracy of 94% with InceptionResNetV2 and 0.03 loss

HONORS AND AWARDS
- Received MS Honors Status at USC (2023)
- Graduated First Division with Distinction (2022)
- Received Anita B.org GHC Scholarship (2021)
- Awarded Mitacs Graduate Research Scholarship (2020)
- Computer Science School Topper at Convent of Jesus and Mary (2018)

LEADERSHIP AND INVOLVEMENT

ITP 165: Introduction to C++ Programming – Teaching Assistant   2023
- Guided over 40 students with labs, homeworks and assignments with introduction to C++; assisted with grading and office hours

Google Developer Student Clubs – ML/AI Mentor   2021
- Guided 70+ students in learning Data Science, ML/AI with hands-on individual mentoring and group sessions on ML and Python

ACM IGDTUW – Core Lead and Advisory Committee   2022
- Organized sessions, workshops, pan-India hackathons, and tech fest; advised the succeeding executive committee of the chapter

All India AI/ML Masters Community (AIMC), IGDTUW – Advanced Mentor   2021
- Coached 20+ Intermediate track ML students in building projects, gaining practical knowledge and provided research counselling

WooTech – ML/AI Advisor Mentor   2021
- Advised, guided and collaborated with undergraduate female students in making projects across India on ML and Computer vision