

MRIDUL PANKAJ KHANNA

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Education

Master of Science – MS, Natural Language Processing (GPA – 3.92/4)

University of California, Santa Cruz (Silicon Valley Campus)

Santa Clara, CA

Sept 2022 – Dec 2023

- Student Ambassador for MS NLP program
- Teaching Assistant (Advanced Programming – C++, Spring 2023)
- Tutor (Software Engineering, Fall 2023), Reader/Grader (Network Programming, Winter 2023)

Bachelor of Engineering – B.E., Computer Engineering (GPA – 3.4/4)

Pune Institute of Computer Technology, India

Pune, India

Aug 2014 – July 2018

Technical Skills

Languages/ Scripting, Tech-skills: C++, C, Python, Java, SQL, Natural Language Processing, Tree based models (Decision Tree), Classification models (Naïve Bayes, SVM), LSTM, Language Modeling, Reinforcement Learning

Tools and Frameworks: Computer Vision (Open CV), OpenAI Gyms, PyTorch, Pandas, Scikit-learn, Git, SpaCy, NLTK, NumPy, TensorFlow, Keras, Android Studio, Pygame (Python module to develop desktop-based games), Rest API's

Work experience (4.5 years)

Reliance Jio Global Resources

Software Development Intern – NLP & ML

Frisco, Texas

June 2023 - Present

- Developing automation scripts in Python for load testing of internal management platform (consisting of different network devices) by hitting Rest API endpoints. Working on this project with **Mimosa Networks**.
- Developed a chatbot on network data using open-source large language model to construct SQL queries, thereby, fetching the answer to the questions on network performance.
- Generated synthetic data from network performance data using “Copulas” library for running chatbot.
- Developed an end-to-end automation framework and set up a cron job for downloading data on a daily basis using PyAutoGUI script followed by backing up and removing the old data from the server.

Ubisoft Entertainment (Research Lab at Indian Institute of Technology, Bombay)

Research and Development Engineer

Mumbai, India

Sept 2018 – Sept 2022

- **Autonomous Navigation in open-world games**
 - Contributed to the development of a Deep Reinforcement Learning solution for autonomous vehicle driving in **The Crew 2** game using the Evolution strategy algorithm CMA-ES.
 - Designed and implemented a distributed system for training and validating the agents for on-road auto-navigation of a car.
 - Executed transfer learning of solution to other open-world games like **Assassin's Creed** and **Far Cry**.
- Optimized the Computer Vision solution to detect defects like floating objects in real-time in the vicinity of auto navigation agent/bot traversing the world by applying the K-Nearest Neighbors (KNN) algorithm.
- Facilitated in developing a sentiment detection solution and entity extraction of players' comments and issues regarding games using DistilBERT model for the Customer Relationship Team (CRC).

Natural Language Processing Projects

Sept 2022 – Present

Enriching Prompts for Text-to-Image Generation using Reinforcement Learning (Capstone Project with Adobe)

- Training a RL policy by using Soft Q-learning algorithm to maximize the reward for the text generated using language model. Reward is composed of Human feedback and aesthetic scores of the images.

Language Modeling on Penn Tree Bank

- Implemented a language model to predict the next word of the given input sequence. Trained a Long Short-Term Memory (LSTM) network using PyTorch and fine-tuned the performance with GloVe embeddings.

Gender De-biasing with Language Model (Professor - Dr. Amita Misra)

- Alleviated bias in the models by applying Data augmentation technique to the OntoNotes 5.0 dataset.
- Evaluated and compared the predictions (probability of pronoun assigned to the sentence containing occupation) with real-world occupation data by U.S Bureau of Labor Statistics on Winogender dataset.

Slot tagging for Natural Language Utterances

- Trained an LSTM network using PyTorch to correctly predict the tag associated with each word in the natural language utterances using IOB scheme.