

Utkarsh Tamrakar

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EDUCATION

M.S., Computer Science | University of South Florida | Expected, May 2022 (GPA: 3.95/4.00)

- *Thesis Topic:* Prediction of the number of objects in a robotic grasp

B.Tech., Computer Science | Jawaharlal Nehru Technological University Hyderabad, India | May 2018

TECHNICAL SKILLS

- **Languages:** C, C++, Java, Python, JavaScript, PHP, Assembly, Prolog, CLIPS, Linux Programming
- **IDE:** Eclipse, NetBeans, Turbo C++, Visual Studio, Android Studio, Sublime, Google Colab, Jupyter Notebook
- **Databases:** Oracle, SQL Server, MySQL
- **Tools/Libraries:** MS Excel, Web Scrapping, BeautifulSoup, Flask, Heroku, Plotly, Matplotlib, Pandas, TensorFlow, Keras, PyTorch, Weka, OpenCV, NumPy, SciPy, scikit-learn, Git, decision tree, random forest, xg boost

EXPERIENCE:

Machine Learning Intern, X2 Analytics

(January 2022, Present)

- Working on a large database (41k+) to perform anomaly detection in the user information and reviews using various Machine Learning techniques.
- Collaborating in teamwork in collecting/web scrapping data, providing intelligence and data-driven analytics to improve business outcomes of B2B clients.

Research Assistant, USF

(August 2021, Present)

- Proposed innovative deep learning models using variations of autoencoder, vision transformer for prediction of number of objects in a novel multi object grasping using robotic hand and its tactile sensors, hand pose angles, torque readings and implemented fine tuning for simulation to real system transfer learning.
- Performed analysis on data collected (100k+) from Barrett Hand and CoppeliaSim simulations system and liaised data cleaning with the team which resulted in 20% improvement in accuracy in neural network models.
- Experimented various deep learning techniques for multi-object grasping, robotic manipulation, classification of imbalanced dataset, noise removal and dimension reduction.

Graduate Teaching Assistant, USF

(August 2021, Present)

- Prepared course materials and projects for Deep learning fundamentals and graded & supervised undergraduate students
- Participated in assessment process and provide effective, timely, and appropriate feedback to students to support their learning

Data Engineer, 3G Solutions, Raipur, India

(July 2018, December 2019)

- Developed OCR software by leveraging image processing, pattern recognition using OpenCV framework and created OMR software with 100% accuracy and reduced team's manual toil by 40%.
- Utilized NumPy, scikit-learn, and machine learning algorithms to perform data processing and analysis and generate insightful reports which were used to improve overall revenue by 3x times.

RESEARCH/ACADEMIC PROJECTS

Reinforcement Learning

- Designed deep neural network for Q-learning, and convolutional neural network with huber loss function using PyTorch.
- Built a DQN and Double DQN agent capable of beating the Atari pong game after 56 hours of training using OpenAI gym.

Sequence Prediction

- Designed recurrent neural networks to estimate the response to a sequence of manipulation actions.
- Built predictive model using LSTM and GRU to model pouring behavior which estimate the change of the amount of water in pouring cup utilizing Keras and TensorFlow with RMSE loss of 0.01280 on test dataset.

Image classifier

- Devised a CNN architecture for object's state classification of food items for robotic cooking using PyTorch with 77% accuracy involving ETL input pipeline and preprocessing, performance optimization, image transformation, evaluation, and inference.

Profiling Internet Users

- Analyzed the Internet usage of each subject with the usage of the same subject and other subjects using spearman correlation. Processed internet usage data of 54 users over a span of month using Pandas.

Graph Traversal Algorithm

- Coded an A* algorithm and BFS algorithm in python, capable of traversing in 8 directions with alternating colors and reaching the end of the maze and visualized the traversal using plotly.

Chatbot

- Deployed a web-scrapper chatbot using Flask and BeautifulSoup for Kik Messenger on Heroku and by leveraging the API to retrieve data from the IMDb database.