

HARSHAD BARAPATRE

[LinkedIn](#) | [GitHub](#) | Buffalo, NY 14216

EDUCATION

University at Buffalo, the State University of New York <i>Master of Science in Computer Science and Engineering</i>	Aug 2021 – Aug 2022 CGPA: 3.84/4
CodePath <i>Certificate in iOS Development</i>	Jan 2022 – May 2022 Score: 100%
MCT's Rajiv Gandhi Institute of Technology, University of Mumbai <i>Bachelor of Engineering in Information Technology</i>	Aug 2017 – Jun 2021 CGPA: 8.59/10

SKILLS

Programming Languages: Python, Swift, R, and Java

Libraries: TensorFlow, Keras, PyTorch, Flask, OpenAI Gym, MPI, NLTK, and CocoaPods

Cloud: GCP and AWS

Tools: Git, Postman, SLURM, KNIME, and Apache Solr.

PROFESSIONAL EXPERIENCE

School of Engineering and Applied Sciences, University at Buffalo <i>Graduate Student Ambassador</i>	Apr 2022 – Present
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- Engaged and interacted with prospective students to assist and answer their questions with regards to the university, student life, and academics on behalf of the Office of Graduate Education.
- Provided outstanding student service by demonstrating core values of leadership and professionalism.
- Participated in student forums and discussion panels to increase enrollment and student participation by 25%.

SELECTED PROJECTS

JellyClub, CodePath (GitHub) <i>Tech Stack - Swift, CocoaPods, Web API, Postman, Git, Xcode</i>	Feb 2022 – May 2022
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- Developed an iOS application for a social network for music enthusiasts and deployed it on TestFlight.
- Used iTunes Search API to fetch tracks and related information including previews, various Cocoapods to implement functionalities, and Back4App to handle the back-end database system.

Tridiagonal Systems of Linear Equations Solver, University at Buffalo (GitHub) <i>Tech Stack – Python, MPI, SLURM, Git, CLI</i>	Feb 2022 – Apr 2022
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- Implemented a parallel prefix product algorithm using MPI on a cluster in collaboration with the Center for Computational Research, University at Buffalo.
- Improved the running time of the algorithm by a factor of 50% in each iterative execution by increasing the number of specifically configured nodes as compared to the sequential algorithm.

Ad-hoc Comparison of Reinforcement Learning Algorithms, University at Buffalo <i>Tech Stack – Python, TensorFlow, Keras, PyTorch, Numpy, OpenAI Gym</i>	Oct 2021 – Present
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- Implemented Deep Q-Networks and Actor-Critic methods on multiple Atari environments by utilizing custom CNN structures and reward functions to speed up training by 40% compared to naïve implementations.
- Solved GymRobotics environments using decentralized and distributed reinforcement learning algorithms.

HATS Search and Sentiment Analysis of Twitter Data, University at Buffalo (GitHub) <i>Tech Stack – Python, AWS, Apache Solr, Flask, TensorFlow, NLTK, Git, Postman</i>	Oct 2021 – Dec 2021
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- Collected more than 150,000 tweets related to COVID-19 and vaccines in multiple languages using the Twitter API and indexed them in Apache Solr on an AWS EC2 instance.
- Implemented the backend of a web application using Flask to enabling multi-keyword queries and designed filters and pagination to streamline the results to increase efficiency by 74%.
- Developed an API to facilitate search and support a dashboard for graphical representations of the entire corpus.

CERTIFICATIONS

- Google Cloud Ready Facilitator Program, Google Cloud, QwikLabs
- PH125.8x: Data Science: Machine Learning, Harvard University, edX
- Data Science Foundations (V2) and Applied Data Science with Python, IBM

LEADERSHIP

Association of Budding Information Technocrats (ABIT-RGIT) <i>President</i>	Sept 2020 – Sept 2021
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- Managed a committee of 100+ students divided in technical, logistics, event management and marketing teams.
- Led a marketing team and successfully raised \$700, an increase of 40% compared to the previous academic year.
- Organized 9 seminars and workshops helping over 500 students improve their skills across various fields.

Ad-hoc Comparison of Reinforcement Learning Algorithms

December 2021

- Created a custom environment based on the OpenAI Gym Structure in Python and solved it using various tabular methods – Dynamic Programming, Monte Carlo, TD(0), Q-Learning.
- Implemented various Deep Q-Networks and Actor-Critic methods on multiple environments like Ms. Pacman, MountainCar, Breakout to compare algorithms like DQN, DDQN, A2C, PPO, and TRPO.
- Utilized custom CNN structures to extract features from image representations of the environment and modified reward functions to speed up the training phase of the algorithms.

Maximizing Stock Value using Reinforcement Learning

November 2021

- Developed a custom stock trading environment based on the OpenAI Gym Structure.
- Fed historical stock trends from the last five years as input data to an RL agent and trained it to perform a series of stock trades to maximize account value over the evaluation period by 150%.

Clustering on the CIFAR-10 Dataset using K-Means and Autoencoders

October 2021

- Clustered the sparse representations of the CIFAR-10 dataset by writing K-Means from scratch and verified the performance using metrics like Average Silhouette Coefficient (ASC) and Dunn's Index (DI).
- Improved the ASC of the algorithm by 33% and the DI by 8% as compared to sklearn built-in K-Means function.

Predicting Agricultural Produce - A Drone Based Solution

May 2021

- Used a custom CNN model to identify crops from leaf image dataset and deployed it as a Streamlit web-app.
- Performed data wrangling and EDA on datasets provided by the Ministry of Agriculture and Farmers Welfare, India.
- Estimated crop production and prices using supervised machine learning classification algorithms in Python.
- Published a research paper in the International Journal of Research and Analytical Reviews.

Coursework: Algorithms Design and Analysis – Parallel and Sequential, High-Performance Computing, Information Retrieval, Machine Learning, Reinforcement Learning, and Data Intensive Computing.