Divit Rawal

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Education

University of California, Berkeley Aug. 2023 – Present
Physics, Mathematics, Electrical Engineering & Computer Science (Minor) *Berkeley, CA*

- Relevant Coursework: Quantum Mechanics, Mathematical Physics, Advanced Programming in R, Data Structures, Deep Learning for Visual Data
- Activities: Launchpad AI/ML, Hands-On PCB Engineering Course Staff

Experience

ExperienceFlow AI May 2024 – Present
Machine Learning Engineering Intern *Remote*

- Reduced necessary training set size by 99% (from 5000 to 50) with minimal impact on performance by using novel machine learning techniques
- Designed, implemented, and evaluated recurrent neural network-based, deep Q-Learning, and SARSA techniques for predicting time evolution of finite state machines and maximizing rewards

Amazon Aug. 2023 – Dec. 2023
OpenSearch Intern *Remote*

- Developed K-means clustering algorithm in Java, improved unit test coverage (from 66% to 78%), and resolved critical data pipeline issues affecting over 1 million users in ml-commons repository
- Selected as member of 2023 OpenSearch Contributor Initiative, collaborating with industry professionals and Amazon Machine Learning Engineers worldwide to build an open-source data analytics and visualization platform

UC Irvine, Department of Physics & Astronomy Feb. 2022 – Jul. 2023
Researcher *Irvine, CA*

- Developed, trained, and tested deep learning models using TensorFlow/Keras to address data scarcity in high momentum collision analysis, achieving over 90% accuracy
- Simulated particle collisions with MadGraph, Pythia8, Delphes, and ROOT; designed and implemented reconstruction algorithms in C++ and Python, successfully predicting particle mass with less than 2% error

Projects

Antichess | *Python, Statistical Decision Making, PyTorch*

- Developed PyPI package to play and simulate antichess games with single or multi-player modes
- Implemented decision making techniques including Minimax with alpha-beta pruning and Monte Carlo Tree Search to enhance strategic gameplay
- Currently designing and implementing a from-scratch multi-head transformer model to score board positions

Neural Navigator | *Graph Neural Networks, Recommender Systems*

- Developed deep-learning based recommender systems to recommend users activities and events in the Bay Area
- Implemented collaborative filtering with LightGCN and matrix factorization methods
- Built web application for user interaction using the React.js and Django frameworks

Physics Directed Reading Program | *Monte Carlo Methods, Machine Learning*

- Studied applications of statistical physics to machine learning in UC Berkeley Physics Directed Reading Program
- Examined Boltzmann machines, Monte Carlo methods, and Markov Chain Monte Carlo methods
- Delivered engaging presentation about the intersection of physics and machine learning to physics students

Certifications

Machine Learning *IBM*

- Studied data analysis, supervised, unsupervised, and semi-supervised learning with a focus on deep learning
- Completed capstone project using machine learning to build recommender systems

Skills

Languages: Python, R, SQL, C, C++, Java, HTML/CSS, JavaScript
Frameworks: ROOT, Flutter, Flask, Mockito, ReactJS, React Native
Libraries: PyTorch, TensorFlow Keras, Pandas, NumPy, Matplotlib, SciKit-Learn, BeautifulSoup