Divit Rawal

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EDUCATION

University of California, Berkeley   Aug. 2023 – Present
Physics, Mathematics & Statistics   *Berkeley, CA*
- **Relevant Coursework:** Statisical Physics; (Graduate) Random Linear Algebra, Optimization, and Large-Scale Learning; Quantum Mechanics; Probability Theory; Discrete Mathematics; Numerical Analysis
- **Activities:** Launchpad AI/ML, Data Structures Peer Tutor, Communcation Networks TA

EXPERIENCE

Berkeley Artificial Intelligence Research (BAIR)   Sep. 2024 – Present
Researcher   *Berkeley, CA*
- Examining in-context learning mechanisms and occurrence in shallow neural networks and kernel machines
- Authoring publication on Neural Tangent Kernels' ability to perform in-context learning using learnability in KRR

ExperienceFlow AI   May 2024 – Sep. 2024
Machine Learning Engineering Intern   *Remote*
- Reduced necessary training set size by 99% (from 5000 to 50) with minimal impact on performance by developing custom, from-scratch transformer and recurrent neural network architectures in PyTorch
- 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
Software Engineering 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 the 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 (compared to 80% previously)
- 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

Foresight | *ReactJS, MongoDB, D3.js*
- Developed a prediction market platform allowing users to bet on discrete and continuous outcomes using interactive probability distributions with D3.js
- Integrated Google OAuth 2.0 for secure sign-in and managed data with MongoDB for group and question sharing
- Implemented group-specific pages with dynamic routing and designed resolution criteria for market outcomes

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 from-scratch spatial attention-based 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

SKILLS

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