

# 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: Probability Theory, Discrete Mathematics, Data Structures, Abstract Linear Algebra, Advanced Programming in R, Deep Learning, Computer Vision, Quantum Mechanics, Computer Networks
- Activities: Launchpad AI/ML, Hands-On PCB Engineering Course Staff, Data Structures Peer Tutor

## EXPERIENCE

### UC Berkeley, Department of Physics

Sep. 2024 – Present

*Researcher*

*Berkeley, CA*

- Conducting research on the emergence of In-Context Learning in wide neural networks using Neural Tangent Kernel theory
- Designing and evaluating deep neural networks within the kernel regime to assess their generalization capabilities

### 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 novel efficient 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

*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 [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

## SKILLS

**Languages:** C, C++, Python, R, Java, HTML/CSS, JavaScript, SQL

**Frameworks:** ROOT, Flutter, Flask, Mockito, ReactJS, React Native

**Libraries:** PyTorch, TensorFlow Keras, Pandas, NumPy, Matplotlib, SciKit-Learn, BeautifulSoup