

# Divit Raal

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## EDUCATION

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### University of California, Berkeley

Aug. 2023 – Present

*Physics, Mathematics, Electrical Engineering & Computer Science (Minor)*

*Berkeley, CA*

- Relevant Coursework: Data Structures, Deep Learning for Visual Data, Advanced Programming in R, Mathematical Physics, Computer Programs, Communication Networks, Information Devices and Systems, PCB Engineering
- Launchpad AI/ML, Hands-On PCB Engineering Course Staff

## EXPERIENCE

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### Amazon

Aug. 2023 – Dec. 2023

*OpenSearch Contributor*

*Remote*

- Selected as member of 2023 OpenSearch Contributor Initiative
- Contributed to the [ml-commons](#) repository by developing machine learning algorithms, unit tests, and plugins
- Collaborated with students, industry professionals, and Amazon Machine Learning Engineers worldwide

### UC Irvine, Department of Physics & Astronomy

Feb. 2022 – Jul. 2023

*Researcher*

*Irvine, CA*

- Developed, trained, and tested TensorFlow/Keras deep learning models to address data scarcity issues in high momentum collision analysis with >90% accuracy
- Simulated particle collisions using MadGraph, Pythia8, Delphes, and ROOT and designed/implemented reconstruction algorithms in C++ and Python to predict particle mass with <2% error

## PROJECTS

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### Neural Navigator | *Graph Neural Networks, LightGCN*

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

### Physics Directed Reading Program | *Statistical Modeling, Machine Learning*

- Studied applications of statistical and thermal physics to machine learning
- Investigated statistical and machine learning methods in physics, focusing on Markov Chain Monte Carlo methods
- Delivered engaging presentation about the intersection of physics and machine learning to physics students

### 3-D Filament Fuser | *PCB Design, KiCad, Circuit Design*

- Conceptualized and designed device that automatically joins 3-D filament together, allowing users to change filament color without interrupting their print
- Designed schematic, layout, and custom-printed circuit board in KiCad
- Presented final product to Apple engineers and UC Berkeley EECS faculty

### Research-Engine | *Python, Flask, Svelte, Web Scraping, Natural Language Processing*

- Led team of 3 to develop Research-Engine, helping users efficiently find and summarize information about a topic
- Developed a full-stack web application hosted on an AWS EC2 instance using Flask and Svelte
- Implemented web scraping and natural language processing to obtain and summarize information from Google

## CERTIFICATIONS

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### IBM Professional Certification in Machine Learning

- 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

### Stanford/UBC Game Theory Certification

- Studied multi and single player games, using mathematical modeling to optimize outcomes

## SKILLS

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

**Frameworks:** ROOT, Flutter, Flask, TensorFlow/Keras, PyTorch, Mockito

**Libraries:** Pandas, NumPy, Matplotlib, SciKit-Learn, BeautifulSoup