BAIR
Berkeley Artificial Intelligence Research

Research Assistant
Berkeley Artificial Intelligence Research · Part-time
Jun 2023 - Present · 1 yr 5 mos
Berkeley, California, United States · On-site

- Hardware and Cloud Researcher in the leading robotics lab at UC Berkeley AutoLab under the guidance of Professor Ken Goldberg
- Developed cloud based ros2 platforms, robotic tele-op applications, and legged robotics utilizing Reinforcement Learning

Skills: Generative AI · Robotics · Computer Vision · Artificial Intelligence (AI) · Machine Learning · Computer-Aided Design (CAD) · Optimization · SAS (Software)

STAC
Space Technologies At Cal.

Project Manager

Space Technologies At California (STAC) · Full-time

Jan 2023 - Present · 1 yr 10 mos

Jan 2023 to Present · 1 yr 10 mos

Berkeley, California, United States · On-site

- Recruited as a Comms engineer for the QubeSAT team with a launch date in 2024 with SpaceX
- Designed, tested, and built the PyCubed board that runs the entire satellite. Worked on RF communication and the WPI protocol to create a secure communication between ground station and the satellite
-Developed Power budget for the payload and flight computer utilizing spreadsheet automation
- Promoted to Project Manager to continue the development of the satellite

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Skills: Python (Programming Language) · Systems Engineering · Electronics · Radio Frequency (RF) · Management

Software Development Engineer Intern
Amazon · Full-time

May 2024 - Aug 2024 · 4 mos

Seattle, Washington, United States · On-site

- Worked in Tier-1 Service at Amazon, Identity login and authorization
- Worked on Integrating existing sign-in workflow with SNA Technology
- Created end-end integration of existing OTP workflow with Twilio's 3rd party API
- Worked in Tier-1 Service at Amazon, Identity login and authorization - Worked on Integrating existing sign-in workflow with SNA Technology - Created end-end integration of existing OTP workflow with Twilio's 3rd party API
Skills: JavaScript · Java · Back-end Operations · Front-End Development · Project Management
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Hardware Engineering Intern

Outer Rim Exploration (ORE) · Full-time

Jan 2024 - May 2024 · 5 mos

Tokyo, Japan · Hybrid

-Helped develop the PCB boards that run the rare metal identifying sensor from a research paper

-Prototyped a future sensors board that could hypothetically be placed in a drone and QubeSAT

-Helped develop the PCB boards that run the rare metal identifying sensor from a research paper -Prototyped a future sensors board that could hypothetically be placed in a drone and QubeSAT

Skills: Hardware Architecture · Electronics Hardware Design · Hardware Engineering · Hardware Development · Hardware Design

Skills: Hardware Architecture · Electronics Hardware Design · Hardware Engineering · Hardware Development · Hardware Design

[Home Page - ORE](#)

[Home Page - ORE](#)

Full Stack Intern

Plant Culture Systems · Full-time

Jan 2024 - May 2024 · 5 mos

Irvine, California, United States · Hybrid

-Wrote a PDR of all irrelevant plant apps to create a user friendly application
-Programmed an app that incorporated all major plant app features
-Developed and trained a full-stack GPT implementation using FlutterFlow and FireBase
-Wrote a PDR of all irrelevant plant apps to create a user friendly application -Programmed an app that incorporated all major plant app features -Developed and trained a full-stack GPT implementation using FlutterFlow and FireBase
Skills: Large Language Models (LLM) · iOS Development · Full-Stack Development · Software Development · Python (Programming Language)
Skills: Large Language Models (LLM) · iOS Development · Full-Stack Development · Software Development · Python (Programming Language)

[Plant Culture Systems](#)

Freelance modeler
Cults · Freelance

Cults · Freelance

Jul 2020 - Jan 2024 · 3 yrs 7 mos

United States · Remote

-Sold professional grade product and graphic designs created in 3D modeling softwares

-Monetized personal product designs

Skills: 3D Modeling · Monetization · 3D Printing

Freelance 3D modeller

CGTrader · Freelance

Aug 2018 - Jan 2024 · 5 yrs 6 mos

United States · Remote

-Sold professional grade product and graphic designs created in 3D modeling softwares

-More complex models sold on CGtrader than Cults such as a Tesla Cybertruck and the SpaceX rocket design

Skills: CNC Manufacturing · Autodesk Inventor · 3D Printing · SOLIDWORKS

More-STEM Initiative Founder

Alameda County Science and Engineering Fair · Self-employed

Aug 2021 - Sep 2022 · 1 yr 2 mos

Aug 2021 to Sep 2022 · 1 yr 2 mos

Dublin, California, United States · Remote

Dublin, California, United States · Remote

- Founded More-STEM initiative in partnership with the regional science fair non-profit, Alameda County Science and Education fair(ACSEF)

-Aimed at providing science fair mentoring to marginalized students

- Managed interactions and expectations brought forward by ASCEF board members with More-STEM team

-Managed organization workflow through Asana

- Reached out and helped over 50+ students within a year

- Founded More-STEM initiative in partnership with the regional science fair non-profit, Alameda County Science and Education fair(ACSEF) -Aimed at providing science fair mentoring to marginalized students - Managed interactions and expectations brought forward by ASCEF board members with More-STEM team -Managed organization workflow through Asana - Reached out and helped over 50+ students within a year

Skills: Leadership · Cross-functional Team Leadership · Team Management · Science

President of Sigma Xi, The DHS chapter

Sigma Xi, The Scientific Research Honor Society · Self-employed

Aug 2020 - Jun 2022 · 1 yr 11 mos

United States · On-site

- Led the club as the Founder and managed a cabinet of 3 other peers
-Provided 40+ members with access to Sigma Xi project funding
-Ran club discussions on Slack and club workflow through Asana

Skills: Leadership · Asana · Slack

Dublin 3-D printing Specialist

PrinToProtect · Freelance

Dec 2020 - Nov 2021 · 1 yr

Dublin, California, United States · On-site

- Onboarded onto team as a 3D printer of Face Shield holders
- Worked with regional team on distribution chains and more efficient models

- Onboarded onto team as a 3D printer of Face Shield holders - Worked with regional team on distribution chains and more efficient models

Skills: Distribution · 3D Printing

Skills: Distribution · 3D Printing

[Company Website](#)

[Company Website](#)

Assistant chess coach

Assistant chess coach

Fallon Chess Club · Part-time

Fallon Chess Club · Part-time

Sep 2018 - Mar 2021 · 2 yrs 7 mos

Sep 2018 to Mar 2021 · 2 yrs 7 mos

Dublin, California, United States · On-site

Dublin, California, United States · On-site

- Recruited as a volunteer assistant coach
-Managed and taught chess to 20-25 kids
- Split time between school and this job

- Recruited as a volunteer assistant coach -Managed and taught chess to 20-25 kids - Split time between school and this job

Skills: Mentoring · Management

Software Developer
Typeface · Internship
May 2024 - Aug 2024 · 4 mos
Palo Alto, California, United States

Developed back-end systems for Typeface's genAI video-focused features to improve marketing productivity and workflow.
Skills: Text-to-Speech Synthesis · Python (Programming Language) · Large Language Models (LLM) · SQL

Researcher
Berkeley Operations and Behavioral Analytics Lab · Apprenticeship
Mar 2024 - May 2024 · 3 mos
Berkeley, California, United States · On-site

Built games and analyzed data for testing human-AI interaction under Prof. Sinchaisri
Skills: Game Development · Data Analysis · Qualtrics · Next.js

TED

Technical Project Manager
TED Conferences · Contract
Jan 2024 - May 2024 · 5 mos
Berkeley, California, United States · Remote

Developed genAI-powered solutions for greater Gen-Z customer acquisition
Developed genAI-powered solutions for greater Gen-Z customer acquisition
Skills: Product Strategy · Generative AI · Full-Stack Development · Next.js · Product Management
Skills: Product Strategy · Generative AI · Full-Stack Development · Next.js · Product Management

coursera

Data Analyst
Coursera · Contract
Sep 2023 - Dec 2023 · 4 mos
Berkeley, California, United States · Remote

Created internal data analysis tools to highlight trends in revenue

Suggested courses to invest in based on these trends

Skills: Product Strategy · Data Analysis · Market Research

Software Engineer Intern
Pikrex · Internship

May 2023 - Aug 2023 · 4 mos

Remote

Developed back-end for autonomous video creation and translation of manga and light novels

Skills: Back-End Web Development · Python (Programming Language) · Computer Vision · Next.js

Technical Analyst
Amazon Web Services (AWS) · Contract

Feb 2023 - May 2023 · 4 mos

Conducting user research and data analysis to suggest recommendations for AWS Spark, an AWS education platform targeted towards high schoolers

Skills: Product Strategy · User Personas · Data Analysis · Python (Programming Language)

Undergraduate Research Assistant
Berkeley Artificial Intelligence Research · Part-time

Sep 2023 - Present · 1 yr 2 mos

Sep 2023 to Present · 1 yr 2 mos

Berkeley, California, United States · On-site

Developing RL (reinforcement learning) algorithms for autonomous drone control. Integrating heuristic-based curriculum learning in combination with off-the-shelf model-free reinforcement learning algorithms such as proximal policy optimization (PPO), soft actor-critic (SAC), and deep deterministic policy gradient (DDPG).

…see more

Python (Programming Language), Machine Learning and +2 skills

Quadrotor Obstacle Avoidance Using Heuristic-Based Curriculum Learning with Vision

Aarush Aitha
aarush.aitha@berkeley.edu

Bryan Li
bryanli0@berkeley.edu

Yikuan Fang
yikuanfang@berkeley.edu

Abstract

In this paper, we propose a curriculum learning framework in combination with reinforcement learning models to improve performance and training efficiency for quadrotor navigation and obstacle avoidance. Our research targets safe and effective flight in outdoors environments, making use of a quadrotor's agility but requiring precise control to avoid obstacles. We also rely on only the flight controller for computational power in combination with a depth image and inertial measurement unit (IMU) data, making real-time flight a challenge when considering obstacle avoidance. In particular, we also do not use GPS localization, making real-time kinematic flight (RTK) infeasible.

These limitations mean that many other approaches will perform below standards, such as Simultaneous Localization and Mapping (SLAM). Furthermore, imitation learning, although explored, has issues with generalization and adaptability in complex environments. Instead, we propose a curriculum learning methodology, gradually exposing the model to tasks of escalating complexity. This approach aims to cultivate a diverse skill set, enhance generalization, and mitigate the risk of overfitting. Our curriculum is augmented by heuristic-based difficulty estimation, providing a guided trajectory through the learning process. Some heuristics we use to define difficulty include the number of obstacles in the environment and their density, as well as the ratio between the optimal path distance found by the rapidly exploring random tree (RRT) method and the Euclidean distance from the start and destination points.

The chosen simulation environment, Isaac Gym, offers a dynamic and realistic setting, closely mirroring real-world challenges. We showcase some successful initial simulations, employing Isaac Gym and AerialGym, and the training and evaluation of several fundamental quadcopter control policies utilizing PPO (proximal policy optimization) and SAC (soft actor-critic) with and without our curriculum learning framework.

We found that integrating our heuristic-based curriculum learning strategy with the off-the-shelf PPO algorithm provided noticeable improvement in our returns, showing that this could be a promising research direction for future work. Furthermore, in our final PPO model trained with curriculum learning for an extended period of time, we achieved a success rate of over 80% despite not fully converging, and achieved a 97% success rate on lower difficulties.

As our research progresses, we pivot towards outdoor long-distance navigation, addressing a notable gap in existing studies. The core of our methodology lies in the synergistic application of reinforcement learning and curriculum learning, offering a structured approach to skill acquisition for agile and adaptive unmanned aerial vehicles.

Our code is fully open source and can be visited here:

https://github.com/bryli/cs285_project

[Quadrotor Obstacle Avoidance Using Heuristic-Based Curriculum Learning with Vision](#)

Software Developer

Neurotech@Berkeley · Part-time

Sep 2022 - Present · 2 yrs 2 mos

Sep 2022 to Present · 2 yrs 2 mos

Berkeley, California, United States · Hybrid

Developed software and built hardware for a blink-controlled RC car using EOG data streamed via Bluetooth from a Muse S headset and processed by Python code. Currently working on a project involving using ML to classify separable actions using EEG data.

…see more

Software Engineer Intern

NVIDIA · Internship

May 2024 - Aug 2024 · 4 mos

May 2024 to Aug 2024 · 4 mos

Santa Clara, California, United States · On-site

Implementing a distributed systems architecture to increase deep learning simulation job throughput by 20%. Designing a new interface for specifying tags and knobs for GPU/model configurations to run LLM workloads. Investigating effects of different hybrid mappings and parallelisms on run time, memory usage, and token throughput

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interface for specifying tags and knobs for GPU/model configurations to run LLM workloads. Investigating effects of different hybrid mappings and parallelisms on run time, memory usage, and token throughput

…see more

Undergraduate Researcher
Berkeley RISE Lab · Part-time

Jan 2023 - May 2023 · 5 mos

Berkeley, California, United States · On-site

Reinforcement learning for NLP, specifically program synthesis tasks such as code autocompletion and code optimization.

University of California, Berkeley
1 yr
Berkeley, California, United States

CS 70 Reader

CS 70 Reader
Part-time
Jan 2023 - May 2023 · 5 mos
On-site

Creating rubrics for student assignments and examinations. Grading student work. Assisting students one-on-one during office hours.

Creating rubrics for student assignments and examinations. Grading student work. Assisting students one-on-one during office hours.

CS 70 Academic Intern
Internship
Jun 2022 - Jan 2023 · 8 mos

Assisted students during discussion by providing hints and explanations when necessary. Taught problems to roughly 20 students relating to modular arithmetic, graph theory, and probability.

CS/AI Intern
Taskformer · Internship
Sep 2024 - Present · 2 mos

Sep 2024 to Present · 2 mos

Data Engineering Intern
Data Engineering Intern
U.S. Department of Homeland Security · Internship

Jun 2024 - Aug 2024 · 3 mos

Jun 2024 to Aug 2024 · 3 mos

Remote

Remote

- Science and Technology Directorate - Technology Centers Division
- Led project regarding Next Generation technology within PSAP/EOC/ECC 911 centers as part of the Technology Centers Division of the Science and Technology directorate
- Collected and scraped data from private data files using Python and Jupyter Notebook through Anaconda
- Used Microsoft PowerBI to make charts, tables, and various visualizations with data
- Led interviews with emergency service workers to gain insight on their experiences with next generation technology and NG911
- Science and Technology Directorate - Technology Centers Division
- Led project regarding Next Generation technology within PSAP/EOC/ECC 911 centers as part of the Technology Centers Division of the Science and Technology directorate - Collected and scraped data from private data files using Python and Jupyter Notebook through Anaconda - Used Microsoft PowerBI to make charts, tables, and various visualizations with data - Led interviews

with emergency service workers to gain insight on their experiences with next generation technology and NG911

Skills: Python (Programming Language) · Pandas (Software) · Data Scraping · Reporting & Analysis · Microsoft Power BI

Data Analyst Research Assistant

University of California, Riverside · Seasonal

Oct 2022 - Jun 2024 · 1 yr 9 mos

On-site

- Developed a data warehouse that integrated data from multiple sources, allowing for comprehensive reporting and analysis
- Compiled and executed data
- Analyzed and interpreted different datasets across a series of studies
- Conducted a study that measures the correlation of behavioral motives and decision making

Skills: Economic Analysis · Analytical Skills · Data Science

Skills: Economic Analysis · Analytical Skills · Data Science

Data Analysis Intern
4L Data Intelligence™ · Internship
Jul 2023 - Oct 2023 · 4 mos
San Francisco Bay Area · Remote

- Web scraping and data extraction from the internet and files containing public/private information
- Data analysis and harvesting of big data files within DevOps and Microsoft Office
- Developed Python programs to retrieve specific data for analysis and implementation parallel to company's objectives
- Web scraping and data extraction from the internet and files containing public/private information - Data analysis and harvesting of big data files within DevOps and Microsoft Office - Developed Python programs to retrieve specific data for analysis and implementation parallel to company's objectives
Skills: Python (Programming Language) · Data Scraping · Web Scraping · C++ · R (Programming Language)
Skills: Python (Programming Language) · Data Scraping · Web Scraping · C++ · R (Programming Language)

Data Analytics and Metrics Intern
Farmers Insurance · Internship

Jun 2023 - Sep 2023 · 4 mos

San Ramon, California, United States · On-site

- Analyze analytics regarding policy details and premium commissions amongst individual agents and compare various data to prior weeks to assess performance and formulate plans for growth
- Discuss and develop protocol pertaining to the restrictions on the different types of insurance — life,
commercial, auto, property, etc.
- Test and organize collected data on production reports, accelerators, and trackers within agents in District 65

Skills: Microsoft Excel · Apex Programming

Regional Head Coach
Arora Tennis and Fitness · Part-time

Nov 2019 - Aug 2023 · 3 yrs 10 mos

- Organized drills and game-improving exercises for students ranging from age 4 to 73
- Coached own summer camp focused on tennis, basketball, football, and baseball to invoke skills of teamwork as well as individuality within students aged 9 to 16
- Private coached adults and children by initiating games and drills as well as after-practice conditioning to append their love for tennis and general fitness

Blood Donor Ambassador
American Red Cross

Jan 2021 - Jun 2023 · 2 yrs 6 mos

- Checked in blood donors who scheduled appointments prior
- Supported patients undergoing procedures through small talk and providing snacks
- Viewed procedure being done first hand and assessed blood type based on attraction between blood cells and antibodies in a microscopic setting

- Checked in blood donors who scheduled appointments prior - Supported patients undergoing procedures through small talk and providing snacks - Viewed procedure being done first hand and assessed blood type based on attraction between blood cells and antibodies in a microscopic setting

Cofounder and Vice President of Internal Affairs
Cofounder and Vice President of Internal Affairs
National Honor Society

National Honor Society

Nov 2020 - Jul 2022 · 1 yr 9 mos

Nov 2020 to Jul 2022 · 1 yr 9 mos

Dublin, California, United States

Dublin, California, United States

- Raised over $600 in application fees and $5,000 in funds for volunteering opportunities for a group of 80+ students
- Worked alongside 3 fellow student officers to organize a branch of the National Honor Society in our city for the first time
- Communicated with external organizations to organize opportunities for students to volunteer and gain hours to graduate on time
- Worked against the struggles presented by the COVID-19 pandemic to compile over 70 distinct volunteering opportunities
- Raised over $600 in application fees and $5,000 in funds for volunteering opportunities for a group of 80+ students - Worked alongside 3 fellow student officers to organize a branch of the National Honor Society in our city for the first time - Communicated with external organizations to organize opportunities for students to volunteer and gain hours to graduate on time - Worked against

the struggles presented by the COVID-19 pandemic to compile over 70 distinct volunteering opportunities

Athlete
Athlete
(USTA) United States Tennis Association
(USTA) United States Tennis Association
Aug 2012 - May 2022 · 9 yrs 10 mos
Aug 2012 to May 2022 · 9 yrs 10 mos
United States
United States

- Won over 20 tournaments (1st Place) in U12, U14, and U16 Divisions
- Ranked top 25 in Northern California for U14
- Ranked #1 player for Dublin High School's Men's Varsity Tennis Team for 3 years
- Won over 20 tournaments (1st Place) in U12, U14, and U16 Divisions - Ranked top 25 in Northern California for U14 - Ranked #1 player for Dublin High School's Men's Varsity Tennis Team for 3 years

Biomedical Engineering Researcher
Biomedical Engineering Researcher
University of Rochester
University of Rochester
May 2021 - Jul 2021 · 3 mos

May 2021 to Jul 2021 · 3 mos

Rochester, New York, United States

Rochester, New York, United States

- Analyzed selected patient's physical difficulties and assessed various treatment plans
- Researched the implications of medical interventions on human physiology
- Utilized skeletal modeling and biomedical innovations to treat patient's problem
- Analyzed selected patient's physical difficulties and assessed various treatment plans - Researched the implications of medical interventions on human physiology - Utilized skeletal modeling and biomedical innovations to treat patient's problem

Skills: Computer Science