

KEVIN MIAO



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Education

University of California, Berkeley | *M.S. Electrical Engineering and Computer Science* **May 2022**

Advisor: Dr. J. Gonzalez

GPA: 4.0

Emphasis: Deep Learning, Computer Vision, Explainable Artificial Intelligence

University of California, Berkeley | *B.A. Computer Science* **May 2021**

Extracurriculars: Data Science Society at Berkeley, California Lightweight Rowing

GPA: 3.86

Highlighted Coursework

- Natural Language Processing
- Data Science
- Deep Reinforcement Learning
- Computer Vision
- Machine Learning
- Full Stack Deep Learning
- Artificial Intelligence
- Efficient Algorithms

Research Experience

Berkeley AI Research Lab, UC Berkeley **Oct 2021 – Present**

Graduate Student

Berkeley, CA

- Creating self-supervised models for interpretable representation learning using Vision-Transformers.
- Training and interpreting efficient and robust pre-training models for non-object centric classification, object detection and segmentation.

Real-time Intelligent Secure Explainable Systems Lab, UC Berkeley **Sep 2020 – Present**

Graduate Student

Berkeley, CA

- Developing novel attention mechanisms for deep learning architecture through the incorporation of weak-supervised attention.
- Fine-tuning segmentation and classification models for automated medical diagnoses using PyTorch and Weights-and-Biases, outperforming other SOTA models with a comparable number of parameters (89% AUC).

Hong Lab, UCSF Bakar Computational Health Sciences Institute **Jan 2020 – May 2021**

Biomedical Data Science Researcher

San Francisco, CA

- Streamlined data engineering pipeline for electronic health records stored in hospital cloud systems using Apache Spark.
- Published paper on training highly discriminatory machine learning models to identify high-risk cancer patients (82% AUC).
- Deployed model for clinical trials at Duke University and UCSF to decrease emergency room loads in a system of 300,000 patients.

Whiteman Lab, UC Berkeley **Jun 2018 – Dec 2019**

Bioinformatics Research Assistant

Berkeley, CA

- Performed computational genome analysis of divergent clades to identify common ancestral relationship.
- Applied dimensionality reduction algorithms on collected data to extract important key insights.

Teaching Experience

Data 198-003: Data Science Research Seminar for Undergraduates **Aug 2021 – Present**

Lead Instructor & Curriculum Developer

Berkeley, CA

- Lecturing weekly seminars, writing course materials and mentoring a group of fifteen underrepresented minority students in data science research.

Data 8: Foundations of Data Science **Jan 2019 – Present**

Teaching Assistant

Berkeley, CA

- Holding weekly discussions, lab sections, and office hours, achieving high student satisfaction (4.8/5.0).

CS61BL: Data Structures **Jun 2020 – Sep 2020**

Course Tutor

Berkeley, CA

- Facilitated homework review sessions, biweekly quizzes, and the midterm exam. Answered students' conceptual questions and helped them debugging coding assignments.

Biology 1B: General Biology **Aug 2018 – Dec 2018**

Undergraduate Student Instructor

Berkeley, CA

- Instructed weekly 4-hour labs, created quizzes, and answered students' questions related to experiments.

Longfellow Middle School **Aug 2017 – Dec 2017**

Student Teacher in Mathematics

Berkeley, CA

- Collaborated with local schools to roll out inquiry-based learning curriculums in middle school STEM courses. Taught 8th grade mathematics weekly.

Professional Experience

Felyx Ride Sharing

Jun 2021 – Aug 2021

Jr. Backend/Machine Learning Engineering Intern

Amsterdam, The Netherlands

- Led end-to-end development of deep learning pipeline, detecting wrongly parked eMopeds, which resulted into effective models (99% mAP).
- Deployed model in GoLang Backend Architecture and iOS App (CoreML) with more than 500,000 users in five European countries.
- Reducing nuisance complaints by 30%, which attracted attention from national news outlets.

monday.com

Aug 2020 – Dec 2020

Machine Learning Consultant

New York City, NY

- Oversaw production of forecasting and regression models to increase the retention of education users on the platform.
- Selected architecture for models to classify viability of marketing opportunities given 100+ predictors (0.05 RMSE).

PayPal

Aug 2019 – Dec 2019

Data Science Consultant

San Jose, CA

- Proposed data-driven, statistically corroborated recommendations leading to increased employee engagement (40%).
- Conducted natural language processing to automate inference and monitoring of employee satisfaction.

Publications and Presentations

Publications

- (1) **Miao, K.**, Singh, R., Petryk, S., Reed, C., Darrel, T., & Gonzalez, J. (2021). Interpretable, self-supervised representation learning of medical radiographs in vision-transformers. rXiv. (Planned Submission)
- (2) **Miao, K.**, Friesner, I., Dahle, J., Yousefi, S., Buchake, B., Kaur, P., Odisho, A. Y., Cinar, P., & Hong, J. C. (2021). Machine learning-based approach to assessing risk of outpatient cancer treatment-related emergency care and hospitalizations. (Under Review)
- (3) Matsunaga, T., Reisenman, C. E., Goldman-Huertas, B., Brand, P., **Miao, K.**, Suzuki, H. C., ... & Whiteman, N. K. (2019). Evolution of olfactory receptors tuned to mustard oils in herbivorous Drosophilidae. *In Molecular Biology and Evolution*.

Presentations

- (1) **Miao, K.**, Dahle, J., Yousefi, S., Buchake, B., Kaur, P., Odisho, A. Y., Cinar, P., & Hong, J. C. (2021). Machine learning-based approach to the risk assessment of potentially preventable outpatient cancer treatment-related emergency care and hospitalizations. *In Journal of Clinical Oncology (Vol. 39, Issue 28-suppl, pp. 333–333). American Society of Clinical Oncology (ASCO)*.
- (2) **Miao, K.**, Singh, R., Petryk, S. & Gonzalez, J. (2021). Towards interpretable deep diagnoses: guiding chest X-ray models using spatial attention. (*RISE Retreat, Summer 2021*) & (*UC Berkeley EECS Research Fair, Fall 2021*).

Technical Strengths

Languages: Python, R, Java, C, HTML/CSS, JavaScript, Swift, SQL, Shell

Technologies/Frameworks: PyTorch, Numpy, Pandas, Scikit-Learn, Sci-Py, Scikit-Image, OpenCV, Flask, Node.js, Linux, Git, Hadoop, Apache Spark, AWS, GCP

Awards and Honors

- 2021 **Distinction in General Scholarship**, UC Berkeley, College of Letters and Sciences
- 2019 **Coxswain of the Year**, California Lightweight Rowing
- 2017 **Debate Cup Champion**, Van Abbemuseum, Eindhoven, The Netherlands
- 2017 **Distinction (Biology, Chemistry)**, National Science Olympiad, Amersfoort, The Netherlands
- 2017 **Finalist**, Netherlands Latin Olympiad, The Hague, The Netherlands

Community Service and Other Activities

- 2021 – Present **Project Mentor** Data Discovery Research Program, UC Berkeley, CA
- 2018 – Present **SF Bay Area Ambassador**, Democrats 66, The Hague, The Netherlands
- 2019 – 2021 **Project Manager & Executive Member**, Data Science Society, Berkeley, CA
- 2018 **Volunteer**, Alta Bates Hospital, Berkeley, CA
- 2018 **Orientation Leader**, UC Berkeley, New Student Services, Berkeley, CA
- 2017 – 2021 **Student-Athlete, Vice-President**, California Lightweight Rowing, Berkeley, CA
- 2017 – 2018 **Member**, Global Environment Theme Program, Berkeley, CA