

# Robert Brown

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## EDUCATION

UC BERKELEY | MPH IN BIOSTATISTICS & EPIDEMIOLOGY

May 2017 | Berkeley, CA

UC DAVIS | BS IN NEUROBIOLOGY, PHYSIOLOGY, & BEHAVIOR, BA IN PSYCHOLOGY

May 2011 | Davis, CA

## EXPERIENCE

MACHINE LEARNING ENGINEER | ATROPOS HEALTH

December 2022 - Present • San Francisco, CA

- Led development of "ChatRWD", an agentic AI application using LLMs and RAG to accelerate Real-World Evidence generation from days to minutes, eliminating human bottlenecks in healthcare research workflows
- Architected and deployed production LLM systems for healthcare data analysis, implementing fine-tuning strategies and prompt engineering techniques to achieve domain-specific performance improvements
- Optimized core ML production codebase achieving 6x performance gains through parallel processing and 100x memory efficiency improvements, handling large-scale healthcare datasets
- Built end-to-end ML pipelines integrating traditional ML and LLM components for automated evidence generation in pharmaceutical and healthcare decision-making

DATA ENGINEER | BERLIN BRANDS GROUP

October 2021 - December 2022 • San Francisco, CA

- Architected scalable data infrastructure using AWS services (S3, Lambda, EC2) and Snowflake, building automated ETL pipelines to process multi-source data streams and provide actionable insights for executive decision-making
- Developed predictive revenue forecasting system using time series models (ARIMA, LSTM, Prophet) integrated into custom Django application, enabling data-driven brand acquisition decisions
- Deployed machine learning models to production environment with monitoring and automated retraining capabilities

DATA SCIENTIST | LOS ANGELES CO. PUBLIC HEALTH DEPT.

May - October 2021 • Los Angeles, CA

- Created production-ready dashboards using Dash and Plotly for real-time epidemiological surveillance and Airflow-based ETL systems for whole genome sequencing data processing, serving 10+ million LA County residents
- Implemented statistical modeling for disease trend analysis and outbreak detection, informing public health policy decisions

HEALTH DATA SCIENCE FELLOW | INSIGHT FELLOWS

September - November 2020 • San Francisco, CA

- Built predictive churn model achieving 78% ROC AUC using advanced feature engineering and survival analysis techniques for healthcare client retention
- Delivered data-driven recommendations to healthcare stakeholders, demonstrating ROI of ML-powered customer segmentation strategies

## ALAMEDA COUNTY PUBLIC HEALTH DEPARTMENT |

EPIDEMIOLOGIST II

August 2019-May 2021 | Oakland, CA

- Led COVID-19 data operations as Data Chief for Incident Command System, managing 25+ data professionals and building county's first agent-based modeling platform for disease forecasting
- Designed production ETL pipelines and SQL Server databases for surveillance of 70+ communicable diseases, ensuring real-time data availability for public health response and resource allocation optimization, producing quarterly disease reports and comprehensive annual surveillance reports

HIV DATA-TO-CARE SPECIALIST

August 2018-August 2019 | Oakland, CA

- Managed the HIV Data-to-Care program for the county, leveraging various case management and surveillance data with integrated inter-departmental work-flows to increase the number of HIV positive residents in care.

DATA ANALYTICS INSTRUCTOR & TA | UC BERKELEY EXTENSION

July 2019 - August 2020 • Berkeley, CA

- Taught comprehensive data science curriculum covering programming, ML, data engineering, and visualization in intensive 6-month bootcamp program

METHOD DATA SCIENCE | RESIDENT DATA SCIENTIST

November 2018 - April 2019 | Remote Work

- Developed ensemble ML algorithm (77% AUC) for hip replacement prediction and built customer segmentation dashboard using unsupervised learning, resulting in 13% customer base increase

EPIDEMIOLOGIST | CA. RURAL INDIAN HEALTH BOARD

October 2017 - August 2018 • Sacramento, CA

- Spearheaded the design and implementation of statewide disease surveillance data collection tools, including IRB and data management processes

- Secured future funding for the organization through successful grant writing efforts
- Developed a centralized data warehouse to store and integrate internal data sources with various state-level datasets, and provided automated reporting and data-driven insights to support leadership decision-making

## **UCSF SCHOOL OF MEDICINE | STATISTICIAN**

June-August 2017 | San Francisco, CA

- Consulted with several research teams to provide multiple high dimensional figures, and provided mathematical modeling and statistical for publications on multi-drug resistant tuberculosis (R).
- Provided multiple imputation on survey question that was systematically missing by sourcing comparable datasets resulting in being able to use validated survey tool.

## **UC BERKELEY | GRADUATE STUDENT RESEARCHER**

August 2016-March 2017 | Berkeley, CA

- Conducted analysis on the accuracy of population estimates of those with a genetic disorder or genetic determinants (e.g. cancer, congenital malformation, etc.) with those of elusive populations (e.g. drug addiction) using both non-Bayesian and Bayesian methods.

## **GOOGLE | PUBLIC HEALTH DATA SPECIALIST**

May-December 2016 | Mountain View, CA

- Responsible for data curation, data analysis of existing public health and medical research.
- Curated, verified, and provided expert feedback to improve the information in the health knowledge graph and related algorithm performance.

## **SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH | RESEARCH ANALYST**

May-December 2016 | San Francisco, CA

- Conducted various statistical analyses, mathematical modeling, data management, and data interpretation on over four studies involving randomized control trials of pharmacologic interventions to treat substance use, HIV risk, and a prospective longitudinal study among transgender youth.

## **AMITY FOUNDATION | PROGRAM COORDINATOR**

February - August 2015 | Los Angeles, CA

- Managed reporting, program evaluation and program implementation for grant that provided mentors to formerly incarcerated individuals.
- Implemented program plan, maintained program management efforts for a financial literacy grant entitled, Financial Empowerment.
- Provided interim support as financial literacy coach, and served as a mentor to formerly incarcerated individuals re-entering back into society.

## **NATIVE AMERICAN HEALTH CENTER | DATA COORDINATOR**

February 2014 - Mar 2015 | Oakland, CA

- Managed data collection, entry and analysis for health clinic that saw over 15 thousand patients at three sites in the San Francisco Bay Area. Supervised two Data Assistants.
- Created clinical and behavioral health reports from EHR with SQL for board of directors, clinicians, staff, and the public that included the status of the clinic and grant funded projects.
- Provided evaluation and project management on a technology integration grant that helped fund the creation of the clinics EHR service.

## **UC DAVIS | RESEARCH ASSISTANT**

September 2008 - June 2011 | Davis, CA

- Collected, maintained, and evaluated data on mutations of cardiac Troponin T and cardiac Troponin C and their relation to familial cardiomyopathies. Proteins were expressed in KO mice using in vitro techniques and structurally analyzed via homology modeling.
- Performed various molecular biology techniques such as gel electrophoresis, and western blots to determine relative levels of Ubiquitin levels and proteasome activity expressed KO mice.

## **ADDITIONAL EXPERIENCE & LEADERSHIP DEVELOPMENT**

### **UC BERKELEY | CENTER FOR HEALTH LEADERSHIP (CHL) FELLOW**

October 2015 - May 2017 | Berkeley, CA

- Selected to participate in a three-semester leadership development program.
- Learning activities include: consulting project with non-profit agency, training workshops, needs assessment, project management and meeting facilitation.

### **SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH | GUEST LECTURER**

July 2016 | San Francisco, CA

- Co-lecturer on Threats to Validity and Causal Inference to undergraduates participating in National Institute of Mental Health (NIMH)-funded Summer HIV/AIDS Research Program (SHARP) at the San Francisco Department of Public Health.

### **BAYEMT | EMT SKILLS INSTRUCTOR**

July 2016 | San Francisco, CA

- Taught various Emergency Medical Technician (EMT) skills to students.
- Provided review sessions for students the National Registry of Emergency Medical Technicians (NREMT) exam.

### **UC DAVIS | TEACHING ASSISTANT**

January 2011 | Davis, CA

- Taught various labs focusing on anatomical and physiological features of the human body using cadavers to undergraduate and graduate students during weekly laboratory meetings.
- Conducted weekly office hours, review sessions for exams and was responsible for maintaining the preservation of the cadavers.

# RESEARCH & IP

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## PATENTS

- Systems and Methods for Automated Evidence Generation. (2023). US Patent Application No. 20250078969 A1. Filed August 29, 2023.

## PUBLICATIONS

- Low, Y. S., Jackson, M. L., Hyde, R. J., Brown, R. E., & others. (2025). Answering real-world clinical questions using large language model, retrieval-augmented generation, and agentic systems. Digital Health, 11. <https://doi.org/10.1177/20552076251348850>
- Brown, R. E., Turner, C., Hern, J., & Santos, G. M. (2017). Partner-level substance use associated with increased sexual risk behaviors among men who have sex with men in San Francisco, CA. Drug and Alcohol Dependence, 176, 176–180. <https://pubmed.ncbi.nlm.nih.gov/28549302>
- Lloyd, T., Bender, M., Huang, S., Brown, R. E., Shiao, R., Yette, E., Shemsu, M., & Pandori, M. (2020). Assessing the use of polymerase chain reaction to screen for shedding of Salmonella enterica in infected humans. Journal of Clinical Microbiology, 58(6). <https://pubmed.ncbi.nlm.nih.gov/32376667>
- Allgeier, D., Gebreegziabher, E., Ycasas, J., Murgai, N., Brown, R. E., & Moss, N. (2018). HIV in Alameda County, 2015–2017. Alameda County Public Health Department. <http://www.acphd.org/media/532487/hiv2018<sub>ac</sub>.pdf>

## PRESENTATIONS

- Jackson, M., Gomber, S., Manickam, R., Brown, R. E., Tekumalla, R., & Low, Y. (2023). Validating a clinical informatics consulting service using negative control reference sets. Observational Health Data Sciences and Informatics.
- Brown, R. E., & Gomes, A. V. (2011). Understanding cardiomyopathies through a molecular modeling approach. Poster presented at the Undergraduate Research, Scholarship, and Creative Activities Conference, Davis, CA.

## SKILLS

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**Programming and ML Frameworks:** Python (PyTorch, TensorFlow, scikit-learn, Pandas, NumPy), SQL, R, PySpark

**LLM and AI Tools:** LLMs (Fine-tuning, RAG, prompt engineering, LangChain, LangGraph, MCP, Hugging Face Transformers)

**Cloud and Infrastructure:** AWS (SageMaker, Lambda, EC2, S3, OpenSearch), GCP, MLflow, Airflow, Docker, CI/CD

**Data Engineering:** ETL pipelines, real-time data processing, API integration, database design

**ML Specializations:** NLP, time series forecasting, survival analysis, A/B testing, ensemble methods, neural networks

## COMMUNITY LEADERSHIP & SERVICE

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- Mentor - Getting into Graduate School (GiGS) at UC Berkeley September 2015 - May 2017 | Berkeley, CA
- Mentor - Amity Foundation March - August 2015 | Los Angeles, CA
- HIV Tester & Counselor - Native American Health Center July 2013 - December 2014 | Oakland, CA
- Youth Services Outreach Intern - The American Red Cross December 2011 - June 2012 | Oakland, CA
- Volunteer Caseworker - The American Red Cross October 2011 - June 2012 | Oakland, CA
- Math Tutor - Davis Bridge January 2008 - June 2011 | Davis, CA
- Intern - Clinica Tepati September 2007 - June 2008 | Sacramento, CA

## AWARDS & FELLOWSHIPS

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- Grow with Google Challenge Scholarship Google via Udacity, January 10, 2018.
- Graduate Opportunity Program (GOP) School of Public Health Full Fellowship award University of California, Berkeley, April 15, 2015.
- Commendation [for public service and dedication to improve quality of life in Alameda county communities] Alameda County Board of Supervisors, San Leandro, May 21, 2012.
- Research Scholar Award University of California, Davis, April 29, 2011.