

Biomedical researcher passionate about applying mathematical theory and developing software to solve problems in biology

## Experience

### Staff Research Associate

University of California Los Angeles (2022 - present)

- Conducted research in two labs investigating metabolic and transcriptional reprogramming across prostate cancer disease states:
  - [Goldstein lab](#)
  - [Boutros lab](#)
- Led two distinct research projects in parallel and developed a third open-source software project
- Hands-on experience in culturing and performing experiments with ~8 different prostate cancer model systems:
  - Lentiviral transductions
  - Immunoblotting
  - Metabolic tracing assays
  - Viability assays
- Developed and applied computational pipelines for transcriptional analysis
- Developed an R datasets package containing processed transcriptional data from over 200 samples across seven different studies at release:
  - Performed data curation and quality assessment where I detected and corrected sample swaps in external datasets
  - Developed an object-oriented dataset class using the S4 system to enable easy access to metadata, sample information, and analysis methods
  - Added gene set enrichment analysis and meta-analysis features
  - Implemented a gene identifier mapping system to enable cross-species analysis without relying on external databases
  - Resolved graphics-rendering failures caused by memory limits and label collisions in enrichment and volcano plots using custom downsampling and cartesian coordinate offsetting algorithms
  - Extended the default lattice axes labeling system to support logarithmic axes
  - Implemented a custom colour-mapping engine based on deriving and using an affine RGB transformation matrix, enabling continuous two-colour gradients and three-colour (diverging) schemes
- Developed RAGToolBox: a modular python package for Retrieval-Augmented Generation (RAG) prototyping
  - Engineered 9 modules with 4 CLI entrypoints for loading, indexing, retrieval, and augmentation
  - Shipped v0.1.0 with tagged release and changelog
  - Implemented 3 CI/CD workflows via GitHub Actions
  - Published packaged to PyPI
  - Implemented continuous unit and integration testing with ~83% coverage

### Lead K-12 Mathematics Instructor

Mathnasium, LLC (2019 - 2021)

- Provided one-on-one and group tutoring in foundational mathematics (e.g. algebra, geometry, trigonometry, calculus) and other general science courses
- Managed learning center operations on weekends:
  - Administered assessments to new students
  - Managed student learning plans
  - Followed up with leads
  - Scheduled and matched instructors with students

# Education

## BS: Biochemistry

University of California Los Angeles (2020-2022)

- Conducted biomedical research while completing undergraduate coursework
- Completed a graduate-level course in mass spectrometry proteomics, and upper-division electives in mathematics and machine learning

## AA (honors): Social and Behavioral Science

Santa Monica College (2015-2020)

- Explored multiple academic tracks before transitioning to STEM
- Worked part-time in service roles and as a peer tutor for foundational science and math courses

# Skills

- Python programming
- R programming
- NumPy
- pandas
- Unix
- Machine learning
- Data science
- Statistics
- Transcriptomics
- Metabolomics
- AI Engineering
- RAG
- Nextflow
- git
- Docker
- CI/CD
- High-performance computing
- Pipeline development and applications
- Applied mathematics
- Network analysis
- Simulation-based inference
- Biomedical experimental design
- Mammalian cell culture
- Immunoblotting
- Microscopy and IHC
- Cellular respirometry
- Scientific communication
- Mentorship