# VICTORIA CHEUNG

victoriakcheung@gmail.com LinkedIn@victoriacheung GitHub@vic-cheung
website: vic-cheung.github.io

## EDUCATION

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|---|---|---|
| (UCSF) University of California, San Francisco | **PhD** | Genetics conc. Systems Neuroscience |
| (UCSD) University of California, San Diego | **BS** | Microbiology |
| Genentech Discovery Program | **Certification** | L.E.A.D Supply Chain |
| Cold Spring Harbor Laboratory | Vision: Linking Circuits, Perception, and Behavior | |

## TECHNICAL SKILLS

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|---|---|---|
| Data Analysis (Python, R, MATLAB) | Adobe Creative Suite (Ai, Lr, Ps ) | Animal Research/Surgery |
| Linux (bash, zsh) | Arduino | PCR/qPCR |
| AWS (EC2, S3) | CAD (Onshape, Cura, eMachineShop) | Microscopy |
| Experimental Design | Histology/Immunohistochemistry | Image Processing (FIJI, Zen) |
| PostgreSQL | Single-cell Omics | |

## CAREER EXPERIENCE

*Genentech* | **Oncology Bioinformatics and Molecular Oncology PhD Intern** *SEP 2021 —PRESENT*

- Characterized gene signature development and refinement for T cell signaling pathways in cancer models
  - Wrote a data processing pipeline utilizing Scanpy, Numpy, Pandas, scikit-learn
  - Performed statistical analyses on different drug treatment populations.
    - Gene set enrichment analysis
    - Differential gene expression analysis
  - Utilized supervised batch correction techniques and unsupervised clustering algorithms (UMAP, topic modeling) to visualize and analyze single cell RNA seq data outputs.
- Wrote custom plotting functions using Matplotlib to better visualize the effect of drug treatments.

*UCSF @Evan Feinberg Lab* | **Graduate Researcher in Single-cell Omics, Systems Neuroscience** *JUL 2016 — DEC 2021*

- **Project 1:** Developed a multiplexed, high-throughput, single-cell sequencing method for neurons that preserve connectivity information in addition to obtaining molecular identity (VECTORseq).
  - Wrote the data processing pipeline using Python after genome alignment using Cellranger (10x Genomics) on an AWS EC2 instance.
    - Used unsupervised machine learning techniques such as t-SNE/UMAP clustering to match molecular identities to cellular function and role in behavioral output.
    - Implemented nearest neighbors algorithms to account for batch differences when merging datasets.
  - Streamlined brain dissociation techniques and increased neuron survivability yield 100-fold based on data-driven outcomes from clustering analyses.
  - Validated clustering results of single-cell sequencing against the 2020 10x sequencing dataset from the Allen Atlas and that the methodology was functional.
    - Evaluated range of highly variable genes expressed per cluster for the validation of cell identity.
  - Managed collaborations with the Chan-Zuckerberg Biohub (Spyros Darmanis Group, now @ Genentech)
- **Project 2**: Designed an audition-based behavioral paradigm to study sensorimotor integration in the context of mice.
  - Wrote custom software to support custom-built hardware using serial communication between MATLAB and an Arduino microprocessor, which increased productivity by 6-fold from the parallelization and automation of data acquisition, storage, and analysis.
    - Used this system in exploring how sensory input is represented in the brain and transformed into behavioral commands, using mice as the model organism.
  - Wrote custom analyses software to automate, refine, and interpret both raw behavioral data and fiber photometry signals.
  - Used CAD software to design and 3D print custom behavioral apparatuses.
  - Refined surgical protocols to increase survival surgery success by 20%. Delivery of viruses, drugs, and organic dyes into the mouse brain.
  - Performed physiology recordings on brain slices to validate optogenetic and fiber photometry experiments
  - Assembled fiber photometry and optogenetic manipulation equipment to record and perturb neuronal activity in the context of quantitative behavioral assays.

*Insight Data Science @Silicon Valley* | **Health Data Science Fellow** *MAY 2020 – JULY 2020*

- Developed a predictive clinical calculator to assess Acute Kidney Injury in hospitalized patients, which would result in better management, care/medication dosing, injury prevention, and reduced hospital length of stay, thus freeing up occupied resources and minimizing financial costs to both patient and hospital.

- Utilized PostgreSQL querying to gather relevant data from the MIMIC-III database and manipulated the data with Python Pandas from 25 tables of data, 46,000 patients, thousands of diagnoses and lab tests, and clinical documentation--generating over 3 million rows of data and 70 unique features comprising lab tests and demographic information.
- Used supervised machine learning in Python such as regression models from scikit-learn and XGBoost to forecast Acute Kidney Injury, with a predictive accuracy of ~91%.
- *Medium Article* in *Towards Data Science*: Predicting Acute Kidney Injury in Hospitalized Patients Using Machine Learning

**OTHER EXPERIENCE**

*Genentech certification course* | **Genentech Discovery Program: L.E.A.D. Supply Chain** *JULY 2020 – AUG 2020*

- Learned about the fundamentals of supply chain, how the supply chain spans a variety of roles throughout Genentech's delivery of therapies as well as its involvement in providing medication access to underserved communities and its drive towards sustainability.
- Chatted with supply chain business leaders to interact with individuals in the industry.
    - Discussed the transferability of skills from the PhD to business/supply chain.
- Participated as Operations Lead in a ***supply chain simulation*** where my team and I **placed second** overall.

**MENTORSHIP | DIVERSITY**

*Evan Feinberg Lab @UCSF* | **Mentor for Undergraduates** *JUN 2016 — SEP 2021*

- Trained and mentored 3 undergraduates on performing research tasks on how to: think independently, plan experiments, perform surgical protocols, and analyze data. Gave career/research advice.
- Post-graduation outcomes of the 3 undergraduates:
    1. data analyst @BoxLunch
    2. research scientist @Alkahest
    3. applying to medical school

*UCSF SRTP* | **Student Advisor** *JUN 2019 — AUG 2019*

University of California, San Francisco (UCSF) Summer Research Training Program (SRTP)

- Developed curriculum to teach rising junior and senior undergraduates on:
    - how to become a strong graduate school applicant
    - how to create compelling posters and presentations
    - how to write personal statements
    - how to read and dissect scientific papers

*UCSF Science & Health Education Partnership (SEP)* | **Student Teacher** *JAN 2016 — JUN 2016*

- Created and developed a series of interactive and investigative lesson plans to teach freshman biology.
- Mentored URMs and socioeconomically disadvantaged students on different career paths in science.

*UC LEADs (University of California, Leadership Excellence through Advanced Degrees)* | **Scholar** *MAR 2013 — JUN 2015*

- Mentorship program for underprivileged and socioeconomically disadvantaged undergraduates for success in graduate school to later assume positions of leadership in industry, government, public service, and academia following completion of a doctoral STEM degree
    - Two-way avenue:
        1. Received mentorship from prior two cohorts as part of the incoming cohort
        2. Provided mentorship to the next two cohorts while progressing through the program

**AWARDS**

2017 Helmsley Scholar
2015 UC LEADs Symposium Presentation Award
2014 SACNAS National Research Conference Travel Scholarship
2013 UCSD STARS Scholarly Presentation Award
2013 SACNAS National Research Conference Travel Scholarship
2013 UCSD Provost Honors
2012 UCSD Provost Honors
2011 UCSD Provost Honors
2012 Kaiser Permanente Valuable Volunteer Award
2011 Kaiser Permanente Student Achievement Award

**PUBLICATIONS**

**Cheung, V**., Chung, P., Bjorni, M., Shvareva, V.A., Lopez, Y.C., and Feinberg, E.H. (2021) Virally Encoded Connectivity Transgenic Overlay RNA sequencing (VECTORseq) defines projection neurons involved in sensorimotor integration. Cell Reports, 37(12):110131

**Cheung, V.** "Predicting Acute Kidney Injury in Hospitalized Patients Using Machine Learning" *Towards Data Science*. Medium, 20 Jun. 2020. Web.