VICTORIA CHEUNG

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EDUCATION

(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

SKILLS

TECHNICAL:

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)
SQL (PostgreSQL)	Single-cell Omics	

DOMAIN KNOWLEDGE:

Biochemistry	Microbiology	Neuroscience/Systems Neuroscience
Genetics/Single-cell Omics	Molecular Biology	Physiology

CAREER EXPERIENCE

Genentech   *SEP 2021 —PRESENT*

Oncology Bioinformatics and Molecular Oncology PhD Intern

- 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   *JUL 2016 — DEC 2021*

Graduate Researcher in Single-cell Omics, Systems Neuroscience

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   *MAY 2020 – JULY 2020*
Health Data Science Fellow
- 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   *JULY 2020 – AUG 2020*
Genentech Discovery Program: L.E.A.D. Supply Chain
- 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.

UCSF @Guo Huang Lab   *APR 2016 — JUN 2016*
Graduate Researcher
Area of Research: Regenerative Potential of Cardiomyocytes
- Performed heart explants for cell culture and subsequent drug studies for the purpose of exploring organ regeneration and repair in neonatal mice—with an emphasis on the pathways that regulate resident stem cell activation and mature cell de-differentiation/proliferation.
  - ○ Explored organ regeneration and development from an evolutionary standpoint across different species of animals *i.e.* naked mole rat, finch, rat, mouse, zebrafish.
- Utilized innovative and integrated approaches in engineering, single cell analysis, advanced imaging microscopy, drug delivery, and genome manipulation technology.

UCSF @Dengke Ma Lab   *SEP 2015 – DEC 2015*
Graduate Researcher
Area of Research: Homeostatic Response to Extreme Abiotic Factors
- Created a functional mutant line in *C. elegans* via cDNA microinjections and exposed the mutants to extreme abiotic environments via behavioral assays to understand cellular intrinsic tolerance of hypoxia/anoxia and hypothermia.
  - ○ Utilized RNA-seq to identify genes implicated in cryopreservation/hypoxia-tolerance with therapeutic potential.
  - ○ Obtained qualitative behavioral data on how animals sensed and responded to changes in internal states to elicit behavior and maintain homeostasis.

UCSD @ Andrew D. Huberman Lab   *DEC 2012 – JUL 2015*
Research Fellowship – UC LEADS & STARS
Area of Research: BINOCULAR PLASTICITY & DYNAMIC STRATEGY IMPLEMENTATION IN CUTTLEFISH

- Developed a model of visual perception and prey capture using cuttlefish to study the neural circuit organization supporting flexible eye movements.
  - Underlying goal: provide insight into amblyopia (lazy eye)
- Optimized behavioral parameters and refined surgical techniques for the novel model organism.
  - Increased consistency between experiments for reproducibility.
- Optimized tracking and analysis of dynamical eye movements using multi-planar high-speed imaging and *Simi Motion* software.
  - Increased productivity and output by 40%
- 3D-reconstructed neuron structure for morphometric analysis using *Neurolucida*.

UCSF @ David R. Copenhagen Lab — **JUN 2014 — SEP 2014**

Research Fellowship– UCSF Summer Research Training Program (SRTP)

Area of Research: EFFECTS OF LIGHT DEPENDENT Ca^{2+} SIGNALING DURING RETINAL DEVELOPMENT

- Explored the effects of light dependent Ca^{2+} waves in the developing mouse retina with a focus on the coupling of amacrine cells to melanopsin ganglion cells via gap junctions.
- Characterized appropriate transgenic lines and established baseline comparisons in adult retina to observe and document deviations from the developed animal to the developing animal.
  - Performed retinal dissections for cell coupling studies.

MENTORSHIP | DIVERSITY

UCSF @ Evan Feinberg Lab — **JUN 2016 — SEP 2021**

Mentor for Undergraduates

- 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 — **JUN 2019 — AUG 2019**

Student Advisor

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) — **JAN 2016 — JUN 2016**

Student Teacher

- 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) — **MAR 2013 — JUN 2015**

Scholar

- 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

CONFERENCES

SCIENTIFIC:

2021	UCSF S.O.L.V.E. Health Tech: Digital Health Equity Summit	attendee
2021	COSYNE (computational and systems neuroscience)	attendee
2018	UCSF Tetrad	oral (15 min) presentation

2017	SFN Annual Conference	attendee
2017	UCSF Tetrad	[poster presentation](#)
2016	UC LEADs Research Symposium	attendee
2015	UC LEADs Research Symposium	poster presentation
2014	SFN Annual Conference	[poster presentation](#)
2014	UCSF Summer Research Training Program Symposium	[poster](#) + oral (15 min) presentation
2014	UCSD Academic Enrichment Program	poster presentation (invited)
2014	SACNAS National Conference	poster presentation
2014	UCLEADs Annual Research Symposium	poster presentation
2013	UCSD Academic Enrichment Program	poster presentation (invited)
2013	SACNAS National Conference	poster presentation
2013	UCSD STARS Summer Research Conference	oral presentation (15 min)

DIVERSITY:

2019	Northern California Forum for Diversity in Graduate Education	speaker (1hr)
2018	Northern California Forum for Diversity in Graduate Education	speaker (1hr)

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 Volunteer Award
2011	Kaiser Permanente Student Achievement Award

MEDIA PRESENCE

2019	[UCSF Article: Students Who Are First in Their Family to Attend College Share Stories, Experiences](#)

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.