ELLIE RAHM KIM

2400 Nueces St, Austin, TX 78705
404-317-0324 | erkim11.github.io | ellierahmkim@utexas.edu

RESEARCH INTERESTS

My research interests revolve around integrating computing/engineering methodologies to formulate innovative approaches for biomedical sciences. I am driven to contribute to the advancement of precision medicine in cancer through the development of novel computational methods that unravel the complexities of the cancer genome.

EDUCATION

AUG 2021- MAY 2025 **The University of Texas at Austin** GPA 3.97

B.S. in Neuroscience
- Minor in Computer Science
- Minor in Computational Engineering
- Minor in Scientific Computation and Data Sciences
- Minor in Applied Statistical Modeling

B.A. in Government
- Minor in Philosophy of Law

RESEARCH EXPERIENCE

OCT 2022- DEC 2023 **The University of Texas at Austin (Mauk Lab)**
Research Assistant
- Conducted research on neural computation using a conductance-based spiking network model
- Managed a project analyzing the efficacy of synaptic plasticity models for network performance
- Led a comparative project on cerebellar cell learning rates in a computational simulation
- Developed Python scripts to visualize neuron spike activity in raster plots and PSTHs

JUN 2023- AUG 2023 **MD Anderson Cancer Center (Akdemir Lab)**
Summer Research Trainee
- Utilized computational tools to analyze 3D chromatin conformation data from tumor samples
- Developed an algorithm to detect recurrent cancer genes from chromatin loop dataset
- Investigated a hypothesis on whether genes linked to 3D chromosomal rearrangements exhibit altered expression levels
- Applied diverse statistical methods to effectively address research questions
- Proficiently handled large-scale genomic data on cluster computing environment
- Actively contributed to lab activities through journal club presentations and mentoring

AUG 2022- OCT 2022 **The University of Texas at Austin (Dunsmoor Lab)**
Research Assistant
- Conducted MRI scans on patients with PTSD while adhering to established safety protocols
- Analyzed data through efficient cleaning and manipulation using Python's pandas and NumPy libraries

NOV 2021- OCT 2022 **The University of Texas at Austin (Mrazek Lab)**
Research Assistant
- Developed a web scraping technique to prospect potential clients
- Designed a data collection strategy that leveraged a federal freedom of information law
- Created visualizations using Python scripts to effectively present findings and insights
- Presented a comprehensive overview of web scraping and HTML parsing

MAY 2022-
JULY 2022

MD Anderson Cancer Center (Akdemir Lab)
Summer Research Trainee

- Developed genomic analysis scripts to study mutational patterns in cancer
- Built an efficient pipeline for identifying significant variants in large-scale genomic data
- Leveraged advanced computational tools to visualize and quantify tumor progression
- Utilized public genomic databases to accurately detect and compare mutations in tumor samples
- Contributed as co-author in lab's manuscript for journal submission

TEACHING EXPERIENCE

JAN 2024-
present

Peer STEM Tutor
College of Natural Sciences, The University of Texas at Austin

AUG 2023-
present

Teaching Assistant
Genetics (BIO 325), The University of Texas at Austin

- Designed lesson plans and led weekly discussion sessions for 30+ students
- Offered personalized assistance during office hours and exam review sessions
- Managed course-related responsibilities, including grading and attending lectures

AUG 2023-
DEC 2023

Teaching Assistant
Neural Systems III: Quantitative Tools (NEU 340), The University of Texas at Austin

- Provided tailored support for students learning coding for scientific research purposes
- Effectively managed administrative tasks alongside a substantial grading workload

JUL 2019-
SEP 2020

Private Tutor
Self-Employed

- Tutored 2 students in High School Mathematics, including Algebra, Calculus, and Statistics

JUN 2019-
DEC 2019

Academic Instructor
Patrick Language Institute

- Instructed 50+ students in preparing for the Test of English as a Foreign Language (TOEFL)

INDEPENDENT PROJECTS

FEB 2023-
APR 2023

Investigating Cell Differentiation in the Brain with a Computational Model of Delta-Notch Signaling and Dynamical System Analysis

- Conducted extensive literature review to inform the development of the computational model
- Developed a Python-based mathematical simulation model to visualize the neural development process over time
- Designed an algorithm inspired by the random walk process to generate a cell network that simulates the interactions between neighboring embryonic stem cells in the brain

FEB 2023-
MAR 2023

Comparative Analysis of Single Nucleotide Polymorphism (SNP) Genomic Data in Patients with Anxiety Disorder (AD) and Major Depressive Disorder (MDD)

- Acquired genomic data from publicly available sources and curated the datasets for analysis
- Conducted exploratory data analysis using dplyr and tidyr packages in R
- Analyzed differences in single nucleotide mutation profiles between patients with AD and MDD
- Created visualizations with ggplot to answer research questions

NOV 2022-
DEC 2022

Simulation Analysis of Neuron Firing Activity in Cerebellar Cells for Learning and Extinction Evaluation

- Performed in-depth analysis of neuron firing activity to investigate learning and extinction rates in classical conditioning trials
- Employed statistical analysis techniques to confirm the accuracy and reliability of the outcomes

- Delivered a presentation on results to classmates and lab members

VOLUNTEER WORK

DEC 2023-present **Advising Fellow**
Matriculate

APR 2022-AUG 2023 **International Orientation Advisor**
International Student and Scholar Services, The University of Texas at Austin
- Served as a mentor and student panelist at the orientation for incoming international students
- Delivered engaging virtual information sessions, presenting insights on student life and answering questions from a 300+ audience

PRESENTATIONS

SEP 2023 Fall Undergraduate Research Symposium, The University of Texas at Austin
AUG 2023 Summer Research Program Poster Competition, MD Anderson Cancer Center
- Winner of the 2023 Poster Competition

APR 2023 College of Natural Sciences Undergraduate Research Forum, The University of Texas at Austin
APR 2023 Longhorn Research Poster Session, The University of Texas at Austin

HONORS & AWARDS

University Honors, The University of Texas at Austin
Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023

Dean's Honor List, College of Liberal Arts, The University of Texas at Austin
Fall 2022 (Summa Cum Laude), Spring 2023 (Summa Cum Laude), Fall 2023 (Magna Cum Laude)

SEP 2023 Central Texas Mensa Scholarship, Mensa Education & Research Foundation
JUN 2023 Government Department Scholarship, College of Liberal Arts, The University of Texas at Austin
JUN 2023 Mensa Foundation Scholarship, Mensa Education & Research Foundation
MAY 2023 CPRIT Research Training Award, Cancer Prevention & Research Institute of Texas (CPRIT)
MAY 2023 International Education Fee (IEF) Scholarship, The University of Texas at Austin
APR 2023 Second Year Excellence Award, College of Natural Sciences, The University of Texas at Austin
APR 2023 College Scholar, University Honors Day, The University of Texas at Austin
MAY 2022 International Education Fee (IEF) Scholarship, The University of Texas at Austin
MAR 2022 Research or Conference Travel Scholarship, The University of Texas at Austin
JAN 2022 Alpha Lambda Delta Honor Society, The University of Texas at Austin

SKILLS

Programming Languages: Proficient in Python, R, Familiar with Bash, Exposed to C++, HTML
Technical Skills: bioinformatics, genomic data analysis, data visualization, cluster computing, certified MRI Level 1 user
Languages: Fluent in Korean