

ELLIE KIM

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EDUCATION

AUG 2021-
MAY 2025 **The University of Texas at Austin**
B.S. in Neuroscience | B.A. in Government

- Certificate in Scientific Computation and Data Sciences
- Certificate in Elements of Computing
- Certificate in Computational Science and Engineering
- Minor in Philosophy of Law

GPA 3.96

Relevant Coursework: Genetics, Neural Computation, Neural Systems I, II, Neural Systems III: Quantitative Tools, Elements of Statistics, Elements of Data Science, Elements of Computers and Programming

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

RESEARCH EXPERIENCE

OCT 2022-
present **Department of Neuroscience at The University of Texas at Austin**
Research Assistant, Advisor: Michael D. Mauk

- 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 scripts to visualize neuron spike activity in raster plots and PSTHs

JUN 2023-
AUG 2023 **Department of Neurosurgery at MD Anderson Cancer Center**
Summer Research Trainee, Advisor: Kadir C. Akdemir

- Developed a novel algorithm to detect recurrently associated cancer genes in chromatin loop dataset
- Conducted bioinformatic analysis to classify molecular subtypes of brain tumor samples based on gene expression
- 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 **Dell Medical School at The University of Texas at Austin**
Research Assistant, Advisor: Joseph E. Dunsmoor

- 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 **Department of Psychology at The University of Texas at Austin**
Research Assistant, Advisor: Alissa Mrazek

- 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
- Department of Neurosurgery at MD Anderson Cancer Center**
Summer Research Trainee, Advisor: Kadir C. Akdemir
- 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
 - Contributed as co-author in lab's manuscript for journal submission

TEACHING & MENTORING

- 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
- 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
- Provided individualized instruction to 50+ students preparing for the TOEFL

WORK EXPERIENCE

- AUG 2021-
DEC 2022
- Customer Service Associate**
International Student and Scholar Services, The University of Texas at Austin
- Managed and addressed inquiries from prospective and current international students
 - Implemented proactive approaches to resolve complex immigration-related issues for students
 - Provided administrative support to 30+ office personnel, ensuring efficient workflow
- FEB 2021-
MAY 2021
- Content Editor**
CJ E&M Entertainment Div., International Business Department
- Edited 100+ video clips of television programs and published with designed thumbnails
 - Leveraged data mining tools to track consumer engagement and analyzed user data to drive strategic decisions
 - Collaborated to develop marketing tactics, resulting in a significant boost in viewership

PROJECTS

- JUN 2023-
AUG 2023
- Structural Disruptions of 3D Genomic Architecture in Human Brain Tumors**
- Utilized computational tools to analyze brain tumor sequencing data and investigate the effects of structural alterations on 3D chromatin conformation
 - Generated and investigated a hypothesis on whether cancer genes linked to structural disruptions exhibit altered expression levels
 - Applied dimensionality reduction, hierarchical clustering, and diverse statistical techniques to effectively address the research question
- 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 on Delta-Notch signaling and cell differentiation to inform the development of the computational model
- Developed a Python-based simulation model that utilizes differential equations and mathematical functions to visualize and analyze the neural development process over time
- Designed an algorithm inspired by the random walk process to generate an agent-based cell network that simulates the interactions between neighboring embryonic stem cells in the brain
- Utilized the ligand-receptor binding mechanism and other biological processes to create a mathematical model that accurately simulates the Delta-Notch signaling system

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

MAY 2022-
JULY 2022

Computational Investigation of Single Nucleotide Driver Mutations and Tumor Evolution Using Chromatin Conformation Data

- Leveraged 3D genome sequencing techniques to gain novel insights into the evolution and underlying drivers of tumors
- Conducted mutational signature analysis to understand the mechanisms of tumor development
- Utilized public genomic databases to accurately detect and compare mutations in tumor samples

POSTER PRESENTATIONS

AUG 2023

CPRIT CURE Summer Program Poster Competition, MD Anderson Cancer Center

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

Dean's Honor List, College of Liberal Arts, The University of Texas at Austin

Fall 2022 (Summa Cum Laude), Spring 2023 (Summa Cum Laude)

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