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Education

The University of Texas at Austin

Bachelor of Science and Arts in Biology	—— GPA: 3.94	May 2021
Elements of Computing Certificate	—— GPA: 3.96	
Pre-Health Professions Certificate	—— GPA: 3.95	

Academic Recognition

College of Natural Sciences: College Scholars — January 2019 - May 2021
- College Scholars include students who have both an in-residence GPA greater than 3.5 and are in the top 20% of their class by GPA. College Scholars is awarded each semester.

College of Natural Sciences: Graduation with Honors — May 2021
- Awarded to the top 20% of the May graduating class may receive honors.

Non-Academic Recognition

International Genetically Engineered Machines Conference 2018 Bronze Medal — October 2018
- Our team designed the Broad Host Range Kit for synthetic biologists working with non-model organisms. In addition to the extensive use of molecular cloning techniques, we also designed a website and surveyed industry experts.

Leadership Experiences

Peer Mentor in Microbe Hackers (Freshman Research Initiative) — January 2019 - July 2021
- As a peer mentor, I grade lab reports, supervise experiments, and lead a small team of freshmen and other mentors. In spring, my role is similar to that of a TA, and in fall, I function as a peer/project-lead.

Peer-Led Undergraduate Studying (PLUS) Facilitator — August 2019 - December 2019
- As a PLUS Facilitator, I helped lead a small discussion for my cell biology professor. Each discussion, we discussed the week's scientific paper and would summarize the lecture materials. We would also host exam reviews during midterms.

Preceptor Coordinator — Health Careers Mentorship Program — April 2020 - November 2020
- As a Preceptor Coordinator, I find physicians and other health professionals willing to take on observers and compile their contact information in our database. Our members can then easily contact and observe them.

Preceptor Director — Health Careers Mentorship Program — November 2020 - May 2021
- As a Preceptor Director, I lead a team to find physicians and other health professionals willing to take on observers and compile their contact information in our database. Our members can then easily contact and observe them.

Preceptor Advisor — Health Careers Mentorship Program — May 2021 - Present
- As a Preceptor Advisor I provide my experience to the new HCMP preceptor team as they navigate many of the same challenges I faced as a coordinator and director.

Research Activities

Researcher in Microbe Hackers Lab
January 2018 - August 2019

- In Microbe Hackers, I used molecular biology techniques to characterize bacterial species inhabiting kombucha (a fermented tea beverage). I designed a toolkit and workflow for working with non-model bacterial species. I performed computations and visualizations in our R&D software, Benchling.

UTEXAS iGEM Team 2018
April 2018 - November 2018

- We designed the Broad Host Range Plasmid Kit. This toolkit helps researchers working with non-model bacteria to find compatible genetic devices. We used molecular cloning and polymerase chain reaction to create the kit. We made a website and participated in the international Interlab Study for iGEM.

Volunteer Researcher in the Mueller Lab
June 2018 - March 2019

- I helped graduate student, Chi-Chun Andy Fang, make a developmental table for three species of myrmicine ants: *Solenopsis invicta*, *Atta texana*, and *Mycocepurus smithii*. I cared for the ant colonies, harvested eggs, and prepared eggs for in situ hybridization and immunohistochemistry.

Undergraduate Bioinformatician at the Kowalski Lab
February 2019 - July 2021

- I perform statistical and machine learning analyses on cancer molecular datasets. My main analyses center around genome-wide unsupervised cluster analysis and combined results clustering, but I also perform quantile survival, enrichment, and association analyses.

Community Service

Volunteering in College — Various Organizations
August 2017 - August 2019

- Since I was a freshman, I've done volunteer work alone or through student organizations. Notably, I've volunteered at the Light the Night Leukemia Walk, Alzheimer's Walk, and food pantry.

Productive Leisure Activities

Photography
August 2015 - Present

- I've done portraiture and macro photography for many years. In high school, I shot senior portraits and athletic photos for the newspaper and yearbook. In college, I've done professional headshots and group photos for student organizations.

Fun with AI
January 2020 - Present

- I frequent the Towards Data Science blog – here, I find interesting data science projects and artificial intelligence applications. As of now, I have built a poetry AI, joke AI, tinder bot, fashion AI and others.

Generative Art
July 2020 - December 2020

- I exercise my creative side with javascript and use simplex noise, random chance, and datasets to create art pieces.

Basic Web Design with Blogdown/Hugo
June 2020 - Present

- I built my own personal/professional website using the R package "Blogdown" and Hugo. This allows me to deploy web pages from a mixture of markdown and HTML files.

Healthcare Activities

Shadowing at Corpus Christi Medical Center Bay Area — December 2018 - January 2019
- I shadowed Dr. Mahmood, an oncologist. Here, I learned the skills that matter most in medicine are not technical, but interpersonal. I was also reminded of the importance of regularly exercising empathy.

Volunteering at Seton Williamson — January 2019 - June 2020
- I worked as a volunteer for the third-floor cardiac unit. My duties included answering the call light, stocking servers, performing discharges, and making patients as comfortable as possible. My work allowed the medical staff to focus on their patients rather than on logistics.

Shadowing at Dell Seton Medical Center — June 2018 - March 2019
- I shadowed Dr. Key, an oncological psychiatrist. Observing showed me the breadth of the cancer experience and the importance of establishing trusting relationships. Kindness is indispensable in pulling patients from destructive habits and pushing them toward well being.

Shadowing at Dell Children's Medical Center — January 2020 - May 2020
- I shadowed pediatric physicians in multiple specialties. The most memorable observation was with Dr. Mincher, a pediatric hospitalist. Dr. Mincher had incredible energy and bedside manner. He encouraged me that I could learn these skills too by "knowing what I need to know to help the patient."

Shadowing at Strictly Pediatrics — January 2020 - May 2020
- I shadowed Dr. Horwitz, a pediatric surgeon. I got to see how years of practice boil down to expertise and elegance. Every doctor and nurse performed excellently, despite taking time to quip. This reminded me that excellence in medicine could be achieved only through years of devoted practice.

Shadowing in Private Practices — January 2020 - May 2020
- I shadowed Dr. Gaglani, an allergist-immunologist. Dr. Gaglani is the embodiment of the physician-teacher. She reminded me of the importance of expertise, confidence, and patience in healthcare delivery.

Health Summit - Health Careers Mentorship Program — April 2021
- The Health Summit is a day-long outreach event hosted by HCMP. It works to expose local high school students to medicine and healthcare through workshops and a panel of professionals.

Technical Skills

- Molecular and Synthetic Biology: PCR, Minipreps, Electroporation, Electrophoresis, Sanger Sequencing Prep
- Data Visualization: Matplotlib; Excel; PowerPoint; Altair, ggplot2
- Bioinformatics: R 3.6.0; Consensus Clustering; Analysis of Cancer Molecular Datasets
- General Software Design: Python 3
- Basic Website Deployment: R 3.6.0; Blogdown; Hugo
- Artificial Intelligence and Machine Learning: Sci-Kit Learn, Tensorflow, and Keras (Python 3)
- Unsupervised Learning: Sci-Kit Learn;ConsensusClusterPlus

Soft Skills

- Teaching and Mentoring: 3+ years as a peer mentor; 0.5 years as PLUS facilitator
- Design and Photo Editing: Adobe Photoshop and Adobe Lightroom
- Desktop Publishing: Adobe InDesign
- Landscape and Portrait Photography
- Professional Communication: Kowalski Lab Presentations
- Collaborative: Over a dozen group projects throughout undergraduate

Projects

Broad Host Range Plasmid Kit — May 2018 - May 2020

- We designed the Broad Host Range Plasmid Kit. This toolkit helps researchers working with non-model bacteria to find compatible genetic devices. We used molecular cloning and PCR to create the kit. We made a website and participated in the international Interlab Study for iGEM.

Capstone Projects: Biostatistics Course SDS 328M — August 2018 - December 2018

- I used R 3.6.0 and ggplot2 to model climatological data from the National Oceanic and Atmospheric Administration's database. I discovered significant differences in precipitation and temperature between regions of the US between 1970 and 2017.

Unsupervised Learning Approach to Characterizing Colorectal Cancers — February 2019 - October 2019

- I performed hierarchical and consensus clustering, quantile survival, enrichment, and association analyses on several molecular datasets in The Cancer Genome Atlas colon adenocarcinoma (TCGA-COAD) dataset. Preliminary analyses show subtle but reproducible differences among cancers from different primary sites, a finding supported by the literature.

Multiplatform Approach to Characterizing Cancer Subtypes — October 2019 - July 2021

- I performed hierarchical and consensus clustering, quantile survival, enrichment, and association analyses on several molecular datasets in the Multiple Myeloma Research Foundation's CoMMpass trial. More data types were used here than in the TCGA-COAD analysis. We identified multiple subtypes in the data that were backed by literature.

Simple Selenium Gmail Bot — February 2020

- I drafted a basic email bot in the Selenium library for Python 3. This bot can take unique information from a file and apply it to an email template.

Alzheimer's Research Project: Data Analytics Course C S 329E — March 2020 - May 2020

- We performed supervised and unsupervised analyses on a molecular dataset with Alzheimer's Disease (AD) samples. We developed a model that can detect AD with 70% accuracy. We also found significant patient clusters inside the dataset, although they did not significantly associate with AD gene expression.

Haiku-Writing Long Short-Term Memory Neural Net — March 2020 - May 2020

- I designed a basic Long Short-Term Memory Neural Net; I trained this LSTM on 10,000 haiku by 18th century Japanese poet Kobayashi Issa. After modifying the LSTM to use a random text seed and pseudo-random text generator, the NN began to write somewhat novel haiku with the characteristic 3-5-3/5-7-5 pattern.

Diversity and Inclusion Initiative: Health Careers Mentorship Program — May 2020 - July 2020

- I developed several surveys to assess the Health Careers Mentorship Program's (HCMP's) intra-organization diversity and inclusion. Ideally, insights from these surveys would help the organization plan its marketing and outreach.

VGG Network-Powered Tinder Bot — May 2020 - July 2020

- I built a Selenium Webdriver bot capable of using Tinder.com. This bot was governed only by probability and would swipe left or right randomly. I performed transfer learning on the VGG Convolutional Neural Network to identify similarity to a training set. When installed in the bot, it effectively allows a user to specify people for which they would swipe right. The AI will swipe right on people that look like the user-specified group.

Consensus Clustering in Python 3 (Numpy, Pandas, Sci-Kit Learn) — May 2020 - June 2020

- There are no widely available Python libraries for consensus clustering. I sought to develop a Python library (packaged into a class) to conduct consensus clustering via Sci-Kit Learn's Hierarchical Clustering, Pandas dataframes, Numpy arrays, and Matplotlib figures. The code must be streamlined due to consensus clustering's computational demands.

Safe Protest Initiative — Texas — May 2020

- The Health Careers Mentorship Program, partnered with the Social Entrepreneurship Learning Lab, raised nearly $7,500 to purchase "Go-Bags." We distributed these bags to Black Lives Matter protesters in Texas. These bags contained KN95 masks and hand sanitizers that helped protesters align with public health guidelines regarding the coronavirus pandemic.

Data-Driven Approach to Search Engine Optimization — May 2020 - May 2020

- I helped a friend assess the best search terms and content to use for a carbon footprint calculator app/website. Used Matplotlib, Pandas, Numpy, and Sci-Kit Learn to process, cluster, and plot the SEO data.

Caffeinated Coli Kit — June 2020 - December 2020

- The Microbe Hackers Lab had engineered a strain of *E. coli* capable of measuring caffeine concentration in common beverages. We are designing the Caffeinated Coli Kit to bring this *E. coli* strain concepts to the classroom. The kit introduces students to synthetic biology through a modified version of our caffeine project and will include instructional videos, scientific equipment, and lesson plans.

Impact Labs Census — August 2020

- I used the Python Pandas and Numpy libraries to assess the ethnic diversity of Impact Labs. I scraped all the members of the organization's Slack channel into a dataset. I then cross-checked this dataset against the US Census to estimate the organization's proportions of races/ethnicities. I then drafted a figure displaying this data and sent my report to the executive board.

Google DeepDream: Forays Into Computer Vision — July 2020 - August 2020

- After rediscovering the Google DeepDream (on the Inception model), I learned the algorithm myself. I now have some scripts that can generate the classic "DeepDream Zoom" movie.

Generative Art: Javascript and Processing — July 2020 - August 2020

- I am practicing my javascript, html5, and Processing skills by creating generative/algorithmic art. Some of this is governed simply by probability, while other pieces rely on simplex noise.

Personal Website: Blogdown/Hugo — August 2020 - Present

- I have designed my professional website using R Blogdown, Hugo, Github, and Netlify. These allow me to build webpages from a template with only markdown, HTML, and CSS files. Netlify enables me to deploy websites from Github repositories.

Biochemistry Memes and Scientific Communication — January 2018 - May 2020

- My capacity to compose biochemistry memes parallels my knowledge of biochemistry and cell biology. Although these memes are primarily humorous, they also function to make complex scientific topics more accessible. I have leveraged these memes to explain cell biology concepts to my non-bioscience friends and peers.

Multiplatform Unsupervised Analyses to Characterize Pancreatic Adenocarcinomas — April 2020 - August 2020

- I performed hierarchical and consensus clustering, quantile survival, enrichment, and association analyses on several molecular datasets in The Cancer Genome Atlas pancreatic adenocarcinoma (TCGA-PAAD) dataset. More data types were used here than in the TCGA-COAD analysis. We identified multiple subtypes in the data that were backed by literature.

Microbe Hackers Scheduler — December 2020 - January 2021

- I designed and developed a Python program to help schedule mentors and students to lab sections and lectures. It takes schedule files from each student and mentor and outputs several valid schedules from which the Research Educator, Dennis Mishler, Ph.D., can choose.

Interests

Oncology | Unsupervised Learning | Cell and Molecular Biology | Computer Vision | Teaching | Portraiture | Generative Art