Michael Zhan

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Objective

Chemical engineering undergraduate student with a strong passion for computer science and data science. Seeking to build on knowledge and experiences through a computer science master's degree program with a concentration on data science.

Education

The University of Texas at Austin **May 2023 (Expected)**

- Pursuing **Bachelor of Science in Chemical Engineering** with **Certificate in Computer Science**
- Overall GPA: **3.99**/4.00, Major GPA: **4.00**/4.00
- GRE: Verbal Reasoning-**162**/170, Quantitative Reasoning-**168**/170, Analytical Writing-**4.5**/6
- Relevant courses: Statistics, Machine Learning (Stanford online course), Software Engineering, Data Analysis, Databases, Discrete Math, Numerical Methods, Vector Calculus

Research and Industry Experience

Genentech, Inc. | Process Technical Development Intern **Apr 2022 – Present**

- Developed soft sensor machine learning models using AutoML models, PLS regression, and CNN-LSTM models using Python and JMP for cell culture parameter prediction with time-series data
- Created automated tool with Python using pandas, a custom-developed API, and seaborn/matplotlib for dataset generation and visualization to train predictive models. Currently in use across multiple Genentech sites. Has been used for FDA manufacturing process compliance checks
- Implemented and streamlined data acquisition workflow for cell culture data within South San Francisco site. Decreased time required from multiple hours to minutes
- Gave weekly updates to manager and soft sensor team
- Initialized and led knowledge transfer to other team members in anticipation of end of internship

Genentech, Inc. | Cell Culture and Bioprocess Operations Intern **Jan 2022 – Jul 2022**

- Led implementation of sample-free bioreactor initialization process in Pilot Plant for molecule development
- Developed UV spectroscopy-based method to determine antioxidant concentration in conditioning buffers to reduce error 10-fold
- Validated the use of a new osmometer and wrote technical report for replacement in drug product toxicology studies
- Supported analytics in Pilot Plant development pipeline for pharmaceutical drug development
- Collaborated with many teams spanning the entire biotech pipeline (cell line development to drug product)
- Presented project results in department-wide meeting in concluding presentation

Georgiou Research Group, UT Austin | Undergraduate Research Assistant **Jan 2020 – Present**

- Developed Python and R analytical workflow using PCA and k-means clustering with RNA sequencing data and the bios2mds R package to identify novel antibody-encoding gene segments in ferrets to be used as future models for influenza and other disease research
- Genetically engineered bacteria in combination with computational screens to develop a correctly folding variant of a previously insoluble enzyme as a potential cancer therapeutic
- Developed fluorescence-based assay with fluorescence-associated cell sorting to determine enzyme viability and screen for possible soluble enzyme variants in a high-throughput setting

HackTX | Hackathon Participant **Oct 2022**

- Created website that allows users to rate and comment on study spots and other notable locations around the UT Austin campus
- Developed RESTful API backend using Python, Flask, and SQL databases
- 24-hour hackathon, worked with in a group of 3
- Held presentation to demonstrate and explain product for judging

Xuan Research Group, UT Dallas | Research Intern **Jun 2019**

- Developed rigorous mathematical proof for novel tool to predict complexity of DNA and RNA sequencing libraries, based on the unseen species problem

Zang Research Group, UT Southwestern Medical Center | Research Intern **May 2018 – Aug 2018**

- Identified and tested 3 drugs as potential new treatments for sepsis. Discovered that 2 of the 3 drugs increased immune cell activity by at least 50% using immunostaining and by tracking metabolic indicators
- Engaged in weekly lab meetings to share findings and research plans
- Prepared and presented research results at end of summer to senior scientists and Principal Investigator in lab-wide meeting

Wu Research Group, UT Southwestern Medical Center | Research Intern **May 2017 – Aug 2017**

- Investigated chemically controllable CRISPR-dCas9 system for temporally controlled and reversible epigenome editing

PepsiCo | Externship **Jan 2020**

- Shadowed sustainability engineer working on water conservation in new and existing PepsiCo manufacturing plants

Teaching and Communication Experience

Independent Tutor **May 2020 – Dec 2021**

- Tutored over 450 hours and over 40 students online throughout COVID-19 pandemic
- Instructed math, chemistry, and physics at high school and college levels
- Coached one student for US National Chemistry Olympiad who received Honors
- Managed lesson planning and scheduling directly with students and parents
- Maintained a 5-star rating on online independent tutoring platform Wyzant

Introduction to Biochemical Engineering | Grader **Aug 2022 – Present**

- Grader for elective biochemical engineering class
- Topics covered include bioreactors, modern molecular biology techniques, the immune system, and vaccines

Research Grant and Manuscript Editing | UT Southwestern Medical Center **May 2020 – Sep 2022**

- Edited multiple grant applications to NIH and research foundations
- Edited multiple manuscripts, acknowledged in publications in *Cancer Research* (https://doi.org/10.1158/0008-5472.can-21-4313) and *Cell Reports* (https://doi.org/10.1016/j.celrep.2021.109357)

Intern Project Report | Genentech Purification Pilot Plant Department Meeting **Jul 2022**

- *"Development of UV spectroscopy-based method for determining antioxidant concentration in conditioning buffer"*

Weekly Team Meeting | Genentech Soft Sensor Team **Apr 2022 – Present**

- Presented detailed updates on work done and next steps on dataset generation and machine learning model development

Research Project Report | UT Southwestern Medical Center, Dept. of Surgery **Aug 2018**

- *"Determining a link between autophagy and macrophage activity in sepsis"*

Skills

- Proficient in coding, data analysis, and model development
    - Languages/Programs: **Python**, **R**, MATLAB, SQL, Java, Excel, Microsoft Office Suite
    - Packages/Modules: pandas, sci-kit learn, NumPy, seaborn/matplotlib, bios2mds
- Strong math and logic skills, excellent at reasoning, analytical, problem solver
- Excellent in teams, effective communicator, strong desire to learn, passionate

Accomplishments/Awards

- 2019 - present, UT Austin Engineering Honors Program
- 2019 - present, Welch Foundation Scholarship, Recipient
- 2019 - present, T. W. Whaley, Jr. Friends of Alec Endowed Scholarship, Recipient
- 2019 - present, UT Austin Cockrell School of Engineering College Scholar Honoree
- 2019, National Merit Scholarship, Recipient
- 2019, Texas Math and Science Coaches Association "Top Gun" Scholarship, Recipient
- 2019, Albert A. Bennett Calculus Contest, 4th place
- 2019, Texas University Interscholastic League State Science Competition, 2nd place
- 2018, US National Chemistry Olympiad, Honors

Extracurricular Activities

- 2020 - present, Omega Chi Epsilon Honor Society, Active Member, Elected Treasurer (2022)
- 2019 - present, American Institute of Chemical Engineers (AIChE), Active Member
- 2017 - 2019, Highland Park High School Math and Science Team, Captain
- 2016 – 2018, Texas Scottish Rite Hospital for Children, Junior Volunteer

Hobbies/Interests

- Rock Climbing, 2nd Place UT Austin Intramural Competition, Advanced Division, Spring 2021
- Tennis, 1st Place UT Austin Intramural Competition, Co-Ed Doubles, Fall 2021
- Viola, UT University Orchestra, Spring 2020
- Volleyball, UT Austin Intramural Participant