

Alan Tian

1530 Brookvale Drive Apt 1, San Jose, CA 95129; Phone: 973-382-4101

alantian2018@gmail.com

Self-motivated and hardworking student with great interest in artificial intelligence, machine learning, algorithms, data analysis, and entrepreneurship. Conducted research at Columbia University, UC Santa Barbara, and participated in Columbia University Academic Year High School Immersion Program. Familiar with research methodology, scientific report writing and presentation.

ACADEMIC:

Georgia Institute of Technology (2023-2027), Atlanta, GA

- Current Freshman at Georgia Tech

Lynbrook High School (2019-2023), San Jose, CA

- GPA (4.0/4.0)
- SAT 1550
- ACT 35
- **College Board AP tests: (10 courses – all 5/5)**
AP Calculus BC & AB Subscore; AP Physics C-Mechanics; AP Physics C-EM; AP Computer Science A; AP Psychology; AP Chinese; AP Language and Comp; AP Statistics; AP Chemistry; AP US History
- **Planned AP Tests: (4 courses)**
AP Biology, AP English Literature and Comp, AP Gov/Pol, AP Spanish Lang
- **College Courses (Taken at West Valley College):**
Math 4A: Intermediate Calculus (Fall 2022)
Math 4C: Linear Algebra (Spring 2023)

JOURNAL PUBLICATION:

Fan, X., Pan, H., **Tian, A.**, Chung, W. K., Shen, Y., SHINE: protein language model-based pathogenicity prediction for short inframe insertion and deletion variants, *Briefings in Bioinformatics*, 2022, bbac584, <https://doi.org/10.1093/bib/bbac584>

PRESENTATIONS:

Tian, A., Zhao, Y., Shen, Y., Transfer Learning to Predict Functional Impact of Missense Variants by Language Model Embedding of Protein Sequences, *International Conference on Intelligent Biology and Medicine (ICIBM 2022)* Philadelphia, PA, August 7-9, 2022 (Poster Presentation)

Tian, A., Dani, A., Yu, L., Vehicle License Plate Recognition and Detection using Neural Networks, *UC Santa Barbara Summer Research Academies 2020 Capstone Seminar*, July 23, 2020

COMPETITIONS and AWARDS:

- **Honorable Mention Award at Synopsys Championship**,
Santa Clara Valley Science & Engineering Fair Association (March 2022)

RRI Physical Science and Engineering project: Integrating Transformer Model of Proteins with Linear Neural Networks to predict Pathogenicity of Missense Mutations

- First place winner, 2022 Augmented Hacks

Developed an interactive visualizer, *CliMap* to predict future climate change using machine learning models Bootstrap and Django. Website: <https://pollution.theglobaltech.org/>

- First place winner, Sneakystraw (a startup company), 2021 National Junior Achievement Social Innovation Challenge. Website: <https://sneaky-straw.square.site/>

- USA Computing Olympiad (USACO): Silver (September 2019-Present)

- American Mathematics Competition: 90 (2021, 91.5 AIME Cutoff)

- 2020 *Canadian Intermediate Math Competition (CIMC)*: Rank 36/7819

- 2019 *Canadian Open Mathematics Challenge*, Performance with Distinction

- 2018 *Canadian Open Mathematics Challenge*, Performance with Honors

RESEARCH AND PRE-COLLEGE PROGRAM:

Research at Shen Lab at Columbia University (mentor: Dr. Yufeng Shen), July 2021-Present

Project: Transfer learning to predict functional impact of missense variants by language model embedding of protein sequences

- Developed a classifier to leverage transformer model embeddings to predict pathogenicity of protein sequences using 120k data sequences.

- Generated protein embeddings using Facebook's ESM-1b and ESM-MSA models and created convolution, RNN, linear classification model

- Conference presentation at ICIBM 2022 and publication at *Briefings in Bioinformatics*

UC Santa Barbara Summer Research Academies (SRA), June -July 2020

Project: Vehicle License Plate Recognition and Detection Using Neural Networks

- Developed license plate recognition technology with modified Multi-task Cascade Convolutional Neural Network (MTCNN) model to perform automatic license plate recognition

- Processed over 25,000 images of license plates with various angles, lighting, and resolutions

Columbia University Academic Year High School Immersion Program (Spring 2021)

Big Data, Machine Learning, and Their Real World Applications

- Developed Twitter topic recognition by using Natural Language Toolkit

- Implemented Artificial Intelligence models in R (Decision Trees, Clustering, Classification, etc.)

ACTIVITIES:

Teaching Assistant (TA) for AP Chemistry at Lynbrook HS

Junior Achievement USA (Sept. 2019- May 2022)

- Participated in weekly entrepreneur mentoring program
- Learned how to start and grow a company
- Co-Founded three startup companies

Company 1: Mamoru (Sept. 2019- May 2020; 5 member team); *Role: Financial Manager*

- Designed phone case with customizable gadgets
- Learned how to draft financial documents and write business plan

Company 2: SneakyStraw (Sept. 2020-May 2021, 6 member team); *Role: Sales Manager*

- Designed a customizable, reusable stainless steel straw
- Built sales connections with businesses (PG&E, Ernst & Young) and generated bulk sales
- Developed a website and Etsy page to facilitate individual orders
- Generated ~\$2000 in revenue over the lifetime of the company
- Formulated company business plan and created slides for the JA company competition

Company 3: GreenTotes (Sept. 2021- May 2022, 5 member team); *Role: CEO*

- Oversaw the project and led team members
- Developed eco-friendly customizable tote bags
- Generated ~\$200 revenue

Creekside Farmers' Market Online Ordering System (April 2020-Jan. 2021)

- Created an online ordering platform with 3 team members to help farmers at Creekside Farmers' Market sell their produce during pandemic
- Raised greater community awareness in assisting small business affected by COVID-19
- Automated transaction recording, calculation, and order acknowledgement
- Facilitated ~\$16,000 in sales in 9 months

Cupertino Math Circle, a branch of National Math Circle (Spring 2020 - present; Co-President since August 2021)

- Taught ~30 middle school students competition math and its role in the real world through bi-weekly meetings
- Organized and wrote problems for the annual Back To School international math competition
- Hosted an in-person math social event
- Invited guest speaker to discuss applications of math
- Organized 2022 fundraising and raised \$1100 in 3 months

STEM Summer camp at Teen Challenge Women & Children's Center, San Jose (July 2022)

Organizer and teacher

- Planned and led two weeks of fun and engaging activities for seven underprivileged children (2nd-5th grade) with mothers recovering from substance abuse
- Conducted science projects, reading, and engaging math games.

Augmented Hacks 2022 1st place winner

- Developed an interactive visualizer, *CliMap* to predict future climate change using machine learning

models, Bootstrap and Django. Website: <https://pollution.theglobaltech.org/>

Menlo Hacks Hackathon (April 2021)

- Developed a natural language processing and sentiment analysis model to evaluate the credibility of twitter tweets by using topic recognition, web scraping, and topic comparison models

ByteKode Hackathon (June 2021)

- Developed a website to classify different types of garbage using image processing
- Taught users about environmental impacts of different types of household waste

Lockheed Martin LEAP Program (Sept. 2019-March 2020)

- Led the software component in a robotic challenge
- Learned how to design engineering prototypes and troubleshoot errors
- Visited the 3D printing lab and gained a deeper understanding of task-orientated design

SKILLS:

- Strong problem solving skills
- Fluent in Chinese, proficient at Spanish

Programming Languages:

- Proficient: Python, Java, R
- Familiar: Javascript, HTML, CSS, C++

Technologies:

- NumPy, Matplotlib, Scikit-learn, TensorFlow, PyTorch, REST APIs, Discord Bots.