

Alena Zhang

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EDUCATION

Duke University, Trinity College of Arts and Sciences

Expected: May 2024

Intended: Bachelor of Science in Computer Science | Bachelor of Science in Economics

Durham, NC

- GPA: 4.0/4.0 | Relevant Coursework: Data Structures and Algorithms, Introduction to Programming in C, Microeconomics
- Awards:** Duke SPIRE (STEM Pathways for Inclusion, Readiness, and Excellence) Fellow (2020)

Westwood High School

Aug 2016 – May 2020

GPA: 4.0/4.0 | Rank: 3/655

Austin, TX

- SAT: 1590/1600 | SAT Math II: 800/800 | AP Computer Science A, Computer Science Principles: 5/5 | IB Computer Science HL: 7/7
- Awards:** National Merit Scholarship Winner (2020), U.S. Presidential Scholar Semifinalist (2020), National AP Scholar (2020)

WORK EXPERIENCE

NASA STEM Enhancement in Earth Science

Jul 2019

Summer Intern

Austin, TX

- Generated graphs of satellite data using **Python's** Matplotlib and NumPy library for 24 locations that experienced natural disasters
- Identified gaps in the data to determine important time frames during natural disasters that the satellite was unable to capture
- Formulated solutions to improve the satellite's ability to assess the impact of natural disasters and inform of possible response measures
- Showcased the effectiveness and feasibility of a solution involving a satellite constellation to NASA scientists in a 30-minute presentation

PROJECTS

Huffman Coding

Nov 2020 - Dec 2020

Data Structures and Algorithms Class Project

Durham, NC

- Programmed in **Java** to implement Huffman coding algorithms for the compression and decompression of text and image files
- Determined encodings for each byte of input data by creating a Huffman tree based on the frequency of each byte in the file

Percolation

Oct 2020 - Nov 2020

Data Structures and Algorithms Class Project

Durham, NC

- Programmed in **Java** to create a Monte Carlo simulation to estimate the value of the percolation threshold in a random system
- Implemented breadth-first-search, depth-first-search, and union-find and analyzed the space-time trade-offs of these approaches

Texas Electric Cooperatives (TEC) Membership Due Calculator

Dec 2019 - Mar 2020

Client-Based Project

Austin, TX

- Programmed in **Java** and **JavaFX** to create a desktop application that calculates yearly membership dues for the 75 members of TEC
- Designed algorithms to calculate dues based on their annual number of electric meters served, profit, and member status
- Built an interface that allows users to enter due-related information and generate yearly invoices to send to members of TEC

Implementation of Blockchain Technology in Cross-Border Transactions

Jun 2019 - Mar 2020

Self-Initiated Research

Austin, TX

- Investigated the potential of blockchain technology to improve efficiency and reduce the risk associated with international transactions
- Analyzed the strengths and weaknesses of 3 existing models that adopted blockchain technology into financial systems
- Devised a method of implementation that maximized speed, affordability, and security and summarized findings in a 4000-word essay

Unit Converter App

Jan 2020 - Feb 2020

Native Mobile App

Austin, TX

- Programmed in **Dart** to build a Flutter app compatible with iOS and Android that converts units in 8 categories
- Designed an interactive user interface, created stateful widgets, and retrieved API data with guidance from Udacity helper code

LEADERSHIP & ACTIVITIES

Duke DTech

Aug 2020 - Present

First-Year Member

Durham, NC

- Joined a leadership development program for high-potential women pursuing technical careers at Duke
- Engaged in technical skill development, mentoring activities, and networking opportunities with tech companies twice a week

Duke Business Oriented Women

Oct 2020 - Present

First-Year Member

Durham, NC

- Selected through a competitive application process to join Duke's premier women's pre-professional organization
- Participated in skill-building workshops, general body meetings, and guest speaker events with industry professionals three times a week

Westwood High School DECA Business Club

Aug 2017 - May 2020

Team Leader

Austin, TX

- Designed and presented a 20-page International Business Plan centered around launching a pollution-reducing car engine filter in China
- Collaborated with 3 team members to evaluate revenue streams, cost structures, key metrics, and detailed financials of the business
- Awards:** Top 16 International Finalist (2019), International Qualifier (2019, 2020), State Winner (2018, 2019, 2020)

SKILLS & INTERESTS

- Skills:** Java(Proficient), Python(Proficient), HTML/CSS(Proficient), C(Proficient), SQL(Proficient), JavaScript(Novice), R(Novice), Dart(Novice), Git(Proficient)
- Languages:** Mandarin (Fluent), French (Proficient)
- Interests:** Going on food tours in big cities, playing the flute, baking soufflés, playing card games