Alex Chen

Computer Science Student

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Education

Columbia University, Fu Foundation School of Engineering and Applied Science — *New York, NY*

Bachelor of Science in Computer Science — *Sept. 2021 - May 2025 (EXPECTED)*

- **Relevant coursework**: Data Structures, Physics: Mechanics and Relativity, Multivariable Calculus, General Chemistry — *Fall 2021*

University of California, Berkeley — *Berkeley, CA*

Pre-College Scholars — *June 2020 - Aug. 2020*

- **Relevant coursework**: Machine Structures — *Summer 2020*

Skills

Languages/Frameworks Java, Python, C, HTML/CSS/JavaScript, PostgreSQL, T-SQL, React, GraphQL, Flask, Azure

Creative/CAD Adobe (Photoshop, Illustrator, Premiere Pro), SolidWorks

Computer Microsoft (Word, PowerPoint, Excel, Outlook), Google Docs, LaTeX, Git

Experience

FIRST Tech Challenge — Robotics Competition — *San Jose, CA*

Programming Lead — *Sept. 2016 - May 2021*

- Refined the pure-pursuit path following algorithm to make better use of holonomic drivetrains; quicker (autonomous) navigation between waypoints made it possible for robots to score more points during the fixed 30-second game period.
- Established a CAD-first workflow within a 15-member team, teaching members to fully design robot mechanisms in SolidWorks; sped up the prototype/build cycle and helped team take full advantage of 3D printing.
- Delegated tasks to a 3-member programming subteam using GitHub.
- Earned the Control Award at World Championships for excellent robot performance because of well-tested code and innovative computer vision algorithms.

Sleekfin — Real Estate Startup — *San Jose, CA*

Frontend Developer, Graphic Designer Intern — *May 2020 - Aug. 2020*

- Created a full mobile app mockup with 30+ screens in Adobe XD from verbal descriptions of desired functionality.
- Developed React Native components for user input; migrated existing codebase to use these new components, unifying the app's design langauge.

Hack on Track — STEM Education Nonprofit — *San Jose, CA*

Co-Founder, Head of Curriculum — *June 2018 - May 2021*

- Taught weekly coding workshops at community centers and low socioeconomic status schools covering SCRATCH, Python, and JavaScript using self-written lesson plans; reached rougly 10–20 new students each session.

Projects

KiloDoc — Collaborative Typesetting Web App

React, GraphQL, PostgreSQL, Azure Functions — *Apr. 2020 - PRESENT*

- Provisioned a full-stack web app consisting of static React code and a GraphQL API running on Azure Functions connected to a PostgreSQL database.
- Optimized the performance of infinitely-scrolling cloud documents by designing a tree-like storage format and dynamically loading/unloading subtrees based on browser viewport.
- Wrote certain SQL queries by hand (instead of using an ORM) to speed up performance-critical tasks and enable complex operations like full-text search within a document subtree.
- Solved the tricky issue of PDF generation by using headless Chromium instances controlled by Puppeteer, consuming an Azure Service Bus Queue and writing to Azure Blob Storage.

Foxtrot — Rapid 2D Spline Generation GUI

Java *Oct. 2019 - Mar. 2020*

- Built a 2D interface using Java Swing for editing splines by drag-and-dropping anchors; supports viewport x/y translation and zoom.
- Utilized by robotics team to rapidly create and test autonomous robot paths.
- Developed custom file format based on JSON that stored the minimum representation of paths; format also contained an array of coordinates and curvatures along the path to aid the robot's path following algorithm.

PALS — Robotics Tournament Scouting Platform

Python, Flask, T-SQL *Nov. 2018 - Apr. 2019*

- Created an online tournament scoring platform on which specifications for each season's robot game could be registered; platform uses game specifications to create scouting forms where each input (checkbox, numeric, etc.) is assigned a point value; platform aggregates form submissions across a tournament to display bar graphs showing team rankings and report each team's strengths/weaknesses.