

# ANTHONY ZHANG

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## EDUCATION

### Duke University, Pratt School of Engineering

Durham, NC

BSE Triple Major in Computer Science, Mechanical Engineering, and Mathematics | Aerospace Engineering Certificate May 2025

GPA: 3.81 / 4.00 | ACT: 35/36 | SAT Math II: 800/800 | Honors: Dean's List, Lynnfield High School Valedictorian

Relevant Coursework: Computer Networks, Computer Systems, Data Structures & Algorithms, Data Analysis & Decision Science

Activities: 1<sup>st</sup> Place Bain x UChicago GCC Case Competition, Duke Quantitative Finance, Asian Students Association, IM Basketball

## WORK EXPERIENCE

### Fidelity Investments – Global Financial Services Firm (\$4.5 Trillion AUM)

Boston, MA

Full Stack Software Engineering Intern

Jun 2023 - Present

- Safeguarded Fidelity Institutional's \$50 billion portfolio by evolving internal application to manage collateral, market, credit risk
- Created 'Data Vault' micro-app (to be used by 500+ analysts) that catalogs over 10K distinct fields, formulas, & metadata across 4+ risk groups with Angular, Java, Maven, Spring, & OracleDB; presented final deliverable to Head of Market & Collateral Risk
- Leveraged Agile methodologies, Scrum Boards, & Jenkins automation software to manage project workflow and CI/CD pipeline

### Cell Signaling Technology – Largest Antibody Supplier (\$200M+ Revenue)

Danvers, MA

Information Technology Intern | [github.com/anthonyjzhang/CloudParameters](https://github.com/anthonyjzhang/CloudParameters)

May 2022 – Aug 2022

- Identified bottlenecks in digital infrastructure; leveraged AWS to streamline production development pipeline for 140 employees
- Developed firmwide cloud computing solution with capabilities to store over 100 terabytes, improving database capacity by ~35%
- Implemented RESTful API function calls via AWS SDK to optimize retrieving, filtering, and storing antibody shipping properties
- Deployed application to store 5000+ key-value parameters using Maven and Spring to query company Amazon DynamoDB tables

### Four Alpha – Sports Betting Arbitrage Startup | [fouralpha.bet](https://fouralpha.bet)

Durham, NC

Co-founder / CEO | [github.com/anthonyjzhang/FourAlpha](https://github.com/anthonyjzhang/FourAlpha)

Dec 2022 – Present

- Founded & led 15 person team; leveraging data-driven strategies to execute risk-free bets that yield 5% guaranteed returns on avg.
- Aggregated historical, pre-game, & live betting odds from 100,000+ events and 12 bookmakers to capture arbitrage opportunities
- Engineered middle-tier with Python and TheOddsAPI to detect arbitrage opportunities across 60+ international sporting markets
- Integrated Firebase to automate storage & display of betting data; programmed frontend with React, designed UI/UX with Figma
- Raised \$10K in capital by creating investor deck and facilitating outreach, funding long-term vision of monetizing B2C SaaS model

## PROJECTS & EXTRACURRICULARS

### McKinsey Digital Hackathon 2023 – Sustainable & Inclusive Growth | [mckinsey-hackathon.vercel.app](https://mckinsey-hackathon.vercel.app)

New York, NY

- Developed gamified digital experience (in 24 hours) for Central Park Conservancy (CPC); utilized React and Vercel to deploy MVP
- Integrated ML recommendation system using Scikit-learn cosine similarity to suggest user-specific actions, driving app stickiness
- Pitched rollout strategy to increase donation/event revenue streams, drive CPC brand awareness, & enhance visitor engagement

### FaceSense - Facial Recognition Machine Learning Application | [github.com/anthonyjzhang/FaceSense](https://github.com/anthonyjzhang/FaceSense)

Durham, NC

- Implemented reliable predictive modeling algorithm to classify over 60 subjects as either 'Unknown', 'Not a Face', or Subject X
- Achieved 92% accuracy in facial recognition between 600+ distinct greyscale images while maintaining an 85% fraction of variance
- Reduced dimensionality of 112x92 images from 10,000 to 150 principal components with Principal Component Analysis (PCA)
- Leveraged ML & data analysis algorithms with Python Scikit-learn: Binary Classification, K-Nearest Neighbor, Random Forest, etc.

### Reliable Transport – Custom UDP Network Protocol | [github.com/anthonyjzhang/ReliableTransport](https://github.com/anthonyjzhang/ReliableTransport)

Durham, NC

- Developed a custom transport UDP protocol in C that forwards real-time packet-level traffic from sender through a simulated link
- Incorporated TCP Reno-like congestion control with additive increase & multiplicative decrease (AIMD), adaptive retransmission timeout (RTO); maximized bandwidth, yielding ~20,000 kB/s transfers with 95% fairness (measured by Jain's fairness index)
- Designed sliding window protocol, ensured in-order transmission, implemented checksum functionality, and handled packet loss

### Duke Applied Machine Learning Group – Innovate Solutions for Real-world Clients

New York, NY

- Advised FinTech startup 'Marco Financial' through strategic cloud migration: transferring on-prem ML models to AWS SageMaker
- Utilized cloud technologies (Lambda, S3, API Gateway) to effectively align IT infrastructure with future scalability requirements
- Streamlined processing of \$18M worth of invoices by conceptualizing innovative pipeline design to enhance document recognition

## SKILLS & CERTIFICATIONS

Languages & Frameworks: Java, Python (Pandas, Scikit-learn, Jupyter), C, JavaScript, TypeScript, Angular, React, Node.js, Spring, SQL

Tools & Software: AWS, Git, Agile, Scrum, Maven, REST, Databases (Firebase, DynamoDB, Aurora), TCP/IP, Figma, Jira, MATLAB

Certifications: AWS Certified Solutions Architect Associate, AWS Certified Cloud Practitioner Foundational, Bloomberg Market Concepts

Interests: Videography, NYT Mini-crosswords, Violin, Thrifting streetwear, Stand-up comedy, Poker, Tenting for Duke vs. UNC, Celtics