

# Ryan Liu

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## EDUCATION

### Northwestern University

B.S. Computer Science and Mathematics | GPA: 3.8/4.00

**Expected Graduation: June 2027**

Evanston, IL

**Relevant Coursework:** Machine Learning, Operating Systems, Data Structures, Algorithms, Databases, Computation Theory

## AWARDS

**ICPC North America Championship Honorable Mention ACM-ICPC**

**2025**

**USACO Platinum USA Computing Olympiad**

**2025**

**American Invitational Mathematics Exam (Top 0.27% of 300,000)** Mathematical Association of America

**2022, 2023**

## EXPERIENCE

### Amazon

**June 2025 – Sep 2025**

#### Software Development Engineer Intern

Seattle, WA

- Designed and deployed 80 site-level call-quality alarms in CloudWatch, enabling detection of poor voice performance across global customer support centers, configured SNS notifications and Lambda-powered auto-remediation workflows
- Architecting an audio-quality scoring system, defining metrics and alert thresholds to track call latency and packet loss

### Juxta Technologies

**June 2024 – Feb 2025**

#### Founding Software Engineer

Chicago, IL

- Led the development of analytics-driven logistics tools for a \$6M health-tech startup backed by \$600K from Lynett Capital, Velocity Catalyst, and Authentic Ventures, improving hospital efficiency and reducing operational costs
- Developed algorithms to minimize idle time, optimize task assignment, and streamline workflows using Python, JavaScript, and Firebase, boosting patient transporter efficiency by 44% and reducing transport times by 7.6 minutes per trip

### Northwestern AI and Security Lab

**January 2024 – Present**

#### Undergraduate Researcher

Chicago, IL

- Applied machine learning to predict time-to-exploitation and severity of Cybersecurity Vulnerabilities and Exposures
- Built CVE data pipelines from diverse datasets, leveraging APIs, web scraping, and data integration techniques
- Developed Northwestern Cybersecurity Early Warning System with Next.js and React to visualize CVE trends and risks

### International Center for Advanced Internet Research

**October 2023 – August 2024**

#### Information Technology Intern

Chicago, IL

- Used machine learning to optimize Data Transfer Nodes (DTNs) with NVMeoF, achieving 400GB/s throughput
- Implemented a JupyterHub-based controller to detect DDoS attacks in real time using Sketch-based Entropy Estimation
- Deployed Python and Bash scripts to monitor network traffic, identify anomalies, and estimate the likelihood of attacks

### Northwestern University

**September 2024 – June 2025**

#### Guest Lecturer, Undergraduate Teaching Assistant - Discrete Math

Chicago, IL

- Delivered a full 50-minute lecture to 107 students on theorems in number theory and connections to encryption
- One of 2 undergraduates to set problems in the recent history of the course; Held weekly office hours to 200+ students

## PROJECTS

**Offline Judge** | Personal Project | [github](#) | 15 hours

**HTTP Requests, Webscraping, C++, Python**

- Developed an offline judge for olympiad problems, with test case scraping and runtime/memory limit enforcement.
- Designed a system using g++, subprocess, and ulimit, ensuring accurate performance benchmarking.

**Customer Churn Prediction** | Personal project | [github](#) | 15 hours

**Python, Machine Learning, Data Processing**

- Developed and deployed ML models, achieving 96% accuracy and 97% F1 score for churn prediction
- Conducted data analysis to identify key churn indicators like income levels and card preferences for actionable insights

## SKILLS

**Programming Languages:** Python, C++, JavaScript, TypeScript, Java, SQL, MATLAB, R

**Softwares and Tools:** Git, Bash, React, React Native, Next.js, Node.js, HTML, CSS, NumPy, scikit-learn, OpenCV, REST APIs, GraphQL, Google Cloud Platform, AWS, Jupyter, PostgreSQL, MongoDB, Docker, CI/CD pipelines