

# Ying Zhang

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## EDUCATION

### Northwestern University

*Ph.D. in Computer Science*

**Advisor** *Fabián E. Bustamante*

Evanston, IL

*Sep 2024 – present*

### Northwestern University

*Master of Science in Computer Science*

**Concentration:** *Distributed Systems and Networks*

Evanston, IL

*Sep 2022 – Dec 2023*

### University of Wisconsin Madison

*Bachelor of Science in Computer Science, Minor in Mathematics*

**Coursework:** *Data Structures and Algorithms, Database, Computer Networks, Operating System*

Madison, WI

*Aug 2016 – May 2020*

## RESEARCH EXPERIENCE

### Northwestern University AquaLab with Professor Fabián E. Bustamante

Jan 2023 – Present

*RouteStress - weighing the submarine cables criticality*

*Evanston, IL*

- Developed Route Stress metric to quantify the reliance on a specific submarine cable by calculating the proportion of routes in a traceroute dataset that traverse the cable.
- Designed a mapping function to link traceroutes with undersea cable infrastructure for more precise network analysis.
- Leveraged iGDB to map terrestrial cable connections and align them with submarine infrastructure.
- Developed constraints to reduce available submarine cable bundle size from landing points to landing points.

*IP Geolocation Accuracy Enhancing Project*

*Evanston, IL*

- Proposed a novel approach to IP geolocation by considering the collective information from traceroutes, enabling more accurate and context-aware geolocation.
- Leveraged IP addresses' geolocation in traceroutes through Round-Trip Time (RTT) and hostnames in Reverse DNS (RDNS), trying to infer reasonable IP geolocation.
- Introduced a weighted module that evaluates the coherence of IP geolocation within entire traceroutes by analyzing the logical alignment of IP hops before and after each point.
- Integrated results into a comprehensive database, incorporating data from CAIDA's Hoiho (Holistic Orthography of Internet Hostname Observations).

*World Global Index of Internet Consolidation Project*

*Evanston, IL*

- Developed a dashboard for an annual survey of dependencies on third-party DNS, CDN, and CA providers and the corresponding consolidation trends around the world.
- Reported consolidation using the consolidation score metric, which quantifies the percentage of popular websites relying on a select few popular providers for each service.
- Website: <http://lisa.cs.northwestern.edu:8080/index.html>

## INDUSTRY EXPERIENCE

### Rubrik Inc.

February 2024 – Sep 2024

*Software Engineer at Core Infrastructure team*

*Palo Alto, California*

- Led a cost-optimization initiative for GCP dev developments.
- Deployed this project across ~100 long-running GCP dev deployments and automated its rollout for all future fresh deployments.
- Diagnosed and resolved recurring pipeline failures, ensuring minimal disruption.
- Facilitated fast, seamless weekly releases with cross-team collaboration.
- Used **Python, Kubernetes, GCP, Docker, Jenkins**

*Software Engineer Intern at Core Infrastructure team*

*Palo Alto, California*

- Integrated the RSC (Rubrik Security Cloud) deployment system with GCP for fast Kubernetes development.

- Reduced GCP dev deployments cost by **40%** (potentially \$400k saving per year).
- Reduced the time to iterate on code changes by **60%** and attributed cost of all dev deployments to future teams.
- Utilized **Kubernetes autoscaling (HPA & VPA)** to dynamically adjust resource allocation based on workload demands, ensuring optimal performance and cost-effectiveness.
- Used **Python, Kubernetes, GCP, Docker, Jenkins**.

## Bytedance Inc.

Nov 2021 – July 2022

*Backend Software Engineer at Douyin E-commerce*

*Beijing, China*

- Developed Buyin platform to facilitate live-streaming sales sessions for live-streamers on Douyin.
- Minimized noises on Buyin for live-streamers by **30%**, boosted message coverage rate by **30%** by updating inbox mechanism and assisted streamers in improving live-streaming skills by introducing essential features on Douyin.
- Restricted unwanted menus without permissions down to zero by upgrading Buyin menu system.
- Used **Go, Redis, MySQL, Hadoop, Kafka, CronJob, Faas, Api Gateway**.

*Backend Software Engineer at Pre-Kid*

*Beijing, China*

- Used HTTP as a backup of WebSocket to enhance stability and reduce commotion during live classroom sessions.
- Integrated live classroom to assist foreign teachers and local students in multiple apps both on PC and mobile.
- Reduced latency of interactions in live classrooms from overseas by **20%** using CDN.
- Successfully landed a web page to provide SOP, such as video-editing SDK for producing courses.
- Used **Go, Http, WebSocket, MySQL, Redis, Hadoop, Elastic Search, RTC, CDN**.

## PROJECTS

### E-Event+: Personalized Event Search and Ticket Recommendation

June 2019 – Dec 2019

- Developed a full-stack web application using with Java serving a REST API to provide event recommendation based on user's geolocation.
- Improved personalized business recommendations based on browser history and favorite records.
- Developed tables as per factory pattern in MySQL to store real business data captured from Ticketmaster API.
- Established web page to assist users in searching adjacent events and purchasing tickets.

### NBA-Chart: React JS-based NBA Player shooting performance visualization

May 2019 – Sep 2019

- Designed a website, highlighting players' performance for basketball fans.
- Visualized individual player's shot data, such as shot chart and user profile view by creating and executing dashboard using React, D3, and Ant Design.

## TEACHING AND MENTORING

### Northwestern Teaching Assistant

September 2024 – Present

- CS340: Introduction to Computer Networking
- Held weekly office hours to assist students with coursework and answer technical questions.
- Collaborated with faculty to develop grading rubrics and address student performance concerns.
- Managed Piazza forum duties in collaboration with other peer mentors, providing timely responses to student inquiries.

### Northwestern Peer Mentor

Jan 2023 – Present

- Conducted weekly mentoring sessions for a group of 10-20 students enrolled in CS336: Introduction to Algorithm.
- Conducted weekly mentoring sessions and answered questions on piazza for class CS340: Introduction to Computer Networking.

## TECHNICAL SKILLS

**Languages:** Golang, Python, Java, C/C++, SQL (Postgres), JavaScript, HTML/CSS, R

**Frameworks and protocols:** Flask, Gin, Hertz, FaaS (Function as a service), API, RPC, WebSocket

**Developer Tools:** Git, Kubernetes, Docker, Google Cloud Platform, Amazon Web Services, Redis, MySQL, Kafka, API Gateway, Tableau

**Libraries:** pandas, NumPy, Matplotlib