JUNZHE ZHANG

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EDUCATION

Bachelor of Science, New York University (NYU), New York, NY Expected Graduation: May 2023
Primary Major: Mathematics; Secondary Major: Computer Science
Cumulative GPA: 3.733 / 4.0
Relevant CS Coursework: Data Structure, Object Oriented Programming, Design & Analysis of Algorithms, Operating Systems, Computer Security, Computer Architecture and Organization, Artificial Intelligence and Society, Software Engineering, Design Project
Relevant Math Coursework: Calculus I&II, Multivariable Calculus, Discrete Math, Linear Algebra, Ordinary Differential Equations, Partial Differential Equations, Numerical Analysis, Complex Variables, Applied Statistics, Applied Probability, Abstract Algebra

EXPERIENCE

Research Assistant, *Flexible AI-enabled Mechatronic Systems Lab*, NYU July 2022 - Present
- Participate in project on depth perception of robots in device-assisted surgeries.
- Apply YOLOv5 algorithm to train robot to detect medical devices such as tweezers, scalpels, etc.
- Leverage NYU High Performance Computing Cluster to enhance the training of machine learning models.
- Use Singularity to create isolated environment and achieved parallelized job submission.

Intern, *Xinghualing Branch, China Construction Bank,* Taiyuan City, China June 2021 - August 2021
- ***Co-developer* of FastOrder, A Spring and Hibernate Based Online Product Ordering System**
- Implemented Rest API via Spring MVC including registration, menu searching, and ordering, checkout, etc.
- Utilized Hibernate to access and operate the data storage (menu, inventory, etc.).
- Used the Spring framework core technologies to loosely decouple all the components in the application.
- Built the client software with React JS and Ant Design to allow users add items to the shopping cart and place orders.
- Provided both authentication and authorization via Spring security to protect the software from malicious attacks.

PROJECTS

Automated Student Meal Reclamation and Donation System January 2022 – Present
- Create a software-based solution that resolves the food insecurity at NYU by providing students with a streamlined, convenient, and reliable access to free or affordable meals.
- Build two databases using PostgreSQL to store student donor information and the surplus of meal swipes.
- Design an algorithm to automatically collect unused meal swipes from student accounts.
- Maintain formal documentations including Software Requirement Specification and Software Project.

Around: Cloud and React Based Social Network February 2022 – June 2022
Frontend
- Designed a social network web application with React JS.
- Implemented features for users to create and browse posts, and search nearby posts.
- Improved the authentication using token-based registration/login/logout flow with React Router v4 and JWT.

Backend
- Launched a scalable web service in Go and deployed it in Google Cloud (Google App Engine).
- Used ElasticSearch (deployed in Google Cloud) to provide search functions.

Starpath: React JS Based Starlink Trajectory Visualization February 2022 – June 2022

- Designed a visualization dashboard using React JS and D3 to track satellites based on geo-location.
- Built location, altitude, and duration-based selector to refine satellite search.
- Animated the selected satellite paths on a world map using D3 to improve user friendliness.
- Deployed the dashboard to Amazon Web Service for demonstration.

Newswipe: Full-stack Web Service for Personalized News Recommendation September 2021 – December 2021

- Designed the Instagram Flavor News app based on Google Component Architectural MVVM Pattern.
- Implemented the bottom bar & page navigation using JetPack navigation component.
- Utilized 3rd party CardStackView (RecyclerView) to support swipe gestures for liking/disliking the news.

Cybersecurity Project: A Study on Defense Measures against Cyberattacks January 2021 – December 2021

- Created mock attack test cases to imitate the behavior of real cyberattacks.
- Built a security reference monitor with Repy V2 to enable access control
  - 90% of mock attacks were blocked.
- Implemented an attack mechanism with C++ that decrypted real user passwords
  - 20 passwords were successfully compromised under 4 hours.
- Analyzed the efficiency, accuracy, and security of SHA1 and SHA256 using the password attack result.

E20: An Assembly Language Emulator February 2021 – May 2021

- Simulated the Intel x86 CPU architecture's assembly language decoding and machine language execution.
- Coded all functionalities in C++; tested and ran the project on Linux terminal.
- Implemented an LRU cache system to improve performance.

PUBLICATIONS

Junzhe Zhang, Rui Li, Ali Fakhry, Dan Zhang, "Enhancing Depth Perception of Lung Tumors in Vision-Enabled Robotic Surgery," Under Preparation.

AWARDS AND HONORS

Dean's List (Fall 2019 – Spring 2020, Fall 2020 – Spring 2021, Fall 2021– Spring 2022)
Tandon Credit Grant, Fall 2019 – Spring 2020
Certificate of Merit, Virginia Mathematics League, 05/05/2018

SKILLS

Programming Languages: Java, C++, C, Python
Web Development: Java Servlet, HTML & CSS, React
Other Skills: Google Cloud, OpenGL, ArcGIS, Excel, Word, PowerPoint, Linux, HPC

LEADERSHIP

Vice President of National Honor Society, Randolph-Macon Academy September 2018 – June 2019

- Organized school events and students' activities with 5-member executive board.
- Examples: Honor Society Induction Ceremony, Military Ball, Homecoming Parade & Memorial Service.

Deputy Squadron Commander, Randolph-Macon Academy September 2017 – June 2019

- Coordinated flight meetings to develop cadets' teambuilding skills.
- Developed and updated administrative plans as the chief adviser to the squadron commander.