Harry Zhu

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Education

George Fox University Graduated April 2024
Bachelor of Science in Computer Science (GPA: 3.55) Newberg, OR

Awards: Computer Science Department Annual Scholarship, Stevens Endowed Scholarship (2022), Pablo M. Ortiz Computer Science Scholarship (2023), 2x Top 500 National Cyber League Competitor (2023-2024)

Technical Coursework: Object-Oriented Design (C++), Algorithms (Scala), Data Structures (Java), Client-Server Systems, Parallel & Distributed Systems (C/C++), Database Systems, Operating Systems (C), Structures of Programming Languages, Computer Architecture, Artificial Intelligence, Machine Learning

Cybersecurity Coursework: Ethical Hacking, Penetration Testing, Computer Networking, Secure Software

Programming Languages: Python, Java, JavaScript, TypeScript, C#, Scala, PHP, C/C++, Bash, PowerShell

Programming Frameworks: React, NextJS, VueJS, Spring, Pandas, Numpy, Scipy, Scikit-Learn

Technical Tools: Docker, Amazon Web Services (EC2, WAF, Lambda), Google Cloud, BigQuery, PostgreSQL, MongoDB, Digital Ocean, Vercel, Postman, Linux, Apache, Git, Wireshark, Tcpdump, Ghidra by NSA

Networking Concepts: TCP/IP protocol suite, UDP, FTP, HTTP, SMTP, SNMP, SSL, TLS

Notable Academic Projects

TZ Medical Electrocardiogram (ECG) Medical Triage | Spring 2024 | **github.com/HarryZ10/ecg**

- Collaborated with 3 students and 12 professionals to translate business requirements into technical specifications
- Extracted 8 domain features on over **34,000+** ECG events by developing standalone data processing and ETL scripts using **SciPy**, **NumPy**, and **Scikit-Learn**, resulting in ∼**95%** precision in identifying unnatural heart rhythms

Personal Career Blog | CS 314 Client-Server Systems | Spring 2024 | **blog.harryzhu.com**

- Designed 10 **React** components and 9 back-end **APIs** using **PHP** and **PostgreSQL** on an **EC2** instance
- Implemented JWT APIs server-side and React Contexts and Hooks to manage user authentication and blog services

Resume Generator | CS 420 Programming Languages | Spring 2024 | **github.com/HarryZ10/api.resumes.guide**

- Developed a public REST service that generates professional results-oriented resume bullet points using Elixir

Haskell Lexical Analyzer | CS 420 Structures of Programming Languages | Spring 2024

- Developed a lexical analyzer in Haskell that processes input strings into a sequence of tokens, facilitating the syntactic analysis phase of a compiler, using finite state machine implementation logic
- Applied pattern matching and functional paradigms to handle reserved keywords, numbers, operators, and identifiers
- Provided error handling for unexpected tokens and invalid variable names, ensuring robust lexer behavior

Ecological Simulation Models | CS 434 Parallel & Distributed Systems | Fall 2023

- Implemented a parallelized predator-prey model in C++ using POSIX threads to simulate ecological dynamics on a grid where multiple threads concurrently update the same grid
- Extended the model using MPI for distributed memory systems in C, managing communication among processes to handle large-scale simulations across 10+ nodes with the ability to save and resume with IPC and checkpointing
- Developed a CUDA-based GPU acceleration model, achieving faster simulation times by offloading computation to the GPU, allowing detailed and large-scale simulation in a fraction of the time

Chess Engine | CS 370 Object-Oriented Design | Spring 2022

- Designed and integrated C++ classes for each piece type, including Bishop, Knight, Pawn, Queen, and Rook, each with their unique move validation, maintaining object-oriented programming principles using inheritance strategies
- Enhanced user experience through a console interface that displays the board status and guides user interaction

Professional Experience

Software Engineering Contributor (Part-Time) — Recidiviz YC19 November 2024 – Present
About: *A civic technology company partnering with state agencies to transform criminal justice by data-driven solutions*

- Contributing 8 hours per week to engage in data platform improvements using BigQuery and Python
- Transformed **200+** YAML schema manifests through caching metadata from BigQuery using Python automation, reducing query time from ∼**2.5s** to near-instant and projecting **$30K+ annual savings** in developer productivity

Software Engineer Intern (Full-Time) — F5 Networks July 2024 – September 2024
About: *A global technology leader providing enterprise-grade application security and delivery solutions*

- Implemented automated debugging using **Bash** shell scripting in Kubernetes-driven containers to analyze **100+** CI/CD pipelines resulting in **70%** faster crash analysis for **45+ developers** on F5's core traffic management system
- Iteratively refined crash analysis procedures through feedback from 3 departments, incorporating suggestions from 30+ engineers to create a solution that gained team-wide adoption
- Expanded knowledge sharing by creating documentation on crash analysis procedures, supporting 30+ developers
- Accelerated crash recovery time by **10%** across teams by aggregating 5+ stack traces into bug reports per day and performing a root cause analysis of **C** runtime and error traces in 50+ CI/CD pipelines that crashed

Software Engineer Intern (Part-Time) — George Fox Communications Office August 2021 – April 2024
About: *The University's marketing hub managing web presence and content strategy*

- Worked 10 hours per week to support and lead in automation efforts for the marketing department
- Engineered 20+ **NodeJS** programs to leverage internal content management system (CMS) APIs, reducing development cycles and time by 90%
- Guided web analytics team through transition to new CMS workflow, developing targeted training materials and providing 1:1 support to ensure smooth adoption
- Streamlined content review time by 95% of 4,000+ pages through an API-driven content management system monitoring web portal using **VueJS**, **Docker**, **PostgreSQL**, **NodeJS** and migration tools
- Enhanced user experience for 1,000+ daily visitors through performance and design optimization of 100+ pages

Software Engineer Intern (Full-Time) — Liminal Insights, Inc. June 2023 – August 2023
About: *A battery technology company optimizing testing and validation processes for EV manufacturers*

- Reduced configuration time by **90%** by developing **NextJS** and **Python** containerized services using Docker
- Enabled industrial-scale battery testing reliability by architecting a high-throughput, message-oriented system that processes 50+ debug logs per minute while maintaining testing throughput through ZeroMQ-based process isolation
- Achieved **95%** uptime for 100+ industrial control events through Redis-driven data flow by removing race conditions

Software Engineer Intern (Full-Time) — Recidiviz YC19 June 2022 – August 2022
About: *A YCombinator-backed civic tech company building data infrastructure for criminal justice reform*

- Eliminated **200+** OWASP security vulnerabilities (including XSS, CSRF, and package dependency issues) through automated scanning and remediation, strengthening platform security by **98%** for state-level criminal justice data
- Built API-driven security account automation system handling **15+** annual departures using Docker and Python frameworks, driving **95%** efficiency gain in audit workflows until replacement by enterprise SOC2 solution in 2024
- Prevented potential security incidents through implementation of 10 new security controls in Google Cloud

Security Analyst Intern (Full-Time) — Northwest Natural Energy, LLC May 2021 – August 2021
About: *A Pacific Northwest energy provider serving 2.5 million customers with natural gas and renewable energy solutions*

- Enabled real-time tracking of 1000+ daily logins through Splunk dashboard implementation for threat detection
- Reduced team search time by 5+ hours weekly through overhaul of 100+ SharePoint files and incident plans

Data Analyst Intern (Full-Time) — East Bay Municipal Utility District June 2018 – July 2018
About: *A Bay Area public utility providing water and wastewater services to 1.4M+ East Bay residents*

- Analyzed 10K+ customer records and personally identifiable information through PL/SQL queries and Excel analytics to support strategic planning initiatives
- Reviewed and marked 100+ historical board meeting archives, highlighting key decisions and policy metrics for departmental reference
- Validated 800+ district boundary customer records through property databases and open-source mapping tools to verify service jurisdiction

Additional Projects

Cascade Content Verification Parser | January 2024 – February 2024 | **github.com/HarryZ10/gfu-validator**

- Engineered a full-stack application with **VueJS** and **NodeJS** that automated content verification for Hannon Hill Cascade CMS, reducing manual review time by **75%** for the digital analytics personnel
- Designed and implemented a containerized microservices architecture using **Docker** with separate frontend, backend, and database services, enabling seamless deployment across different environments

Pickabox | February 2021 (Revised May 2024) | **pickaboxdemo.netlify.app**

- Won 2nd place in Best Design by building a web app used by **1K+ users** to aggregate **Wikipedia** articles
- Designed and launched an app utilizing **React**, **Express**, and**Google Cloud Functions** and showcasing random Wikipedia articles to enhance user learning and exploration

Confined Indorms | March 2020 – May 2020 | **gameheads.itch.io/confined-indorms**

- Led development of an isometric Unity game that simulates managing mental health and daily tasks during COVID-19 quarantine, collaborating with 6 game developers of various disciplines in a fully remote environment
- Architected event-driven task management system in C# to handle 20+ unique interactions and multiple narrative branches, resulting in a non-linear gameplay experience that reflects real student experiences during lockdown

Leadership Activities

Lab Fellow (Part-Time) — George Fox College of Engineering August 2022 – April 2024
About: *A peer mentorship program supporting 70+ computer science students through technical coursework*

- Mentored 45+ students in group sessions for data structures, algorithms, database systems, and operating systems for 5 hours per week
- Developed personalized mentoring approaches for diverse learning styles, resulting in 70% of tutored students showing improved academic performance
- Created inclusive study environments for 45+ students from various technical backgrounds, adapting communication styles to bridge knowledge gaps and build student confidence

Director of Student Associations (Part-Time) — George Fox University August 2023 – April 2024
About: *A university-wide leadership role overseeing 50+ student organizations and managing strategic initiatives*

- Worked 7 hours per week to support, empower, and celebrate 50+ student associations and clubs
- Automated club expenditure system using **Google Apps Script API**, reducing approval timeline by **93%** while managing **100+** form submissions and a **$50K** operating budget
- Coordinated onboarding for **50+** club leaders, conducting **20+** leadership development sessions
- Led two biannual club president roundtables to guide cross-club collaboration, leading to **20+** joint campus events

Treasurer — George Fox Asian Student Union August 2023 – April 2024
About: *An AAPI cultural organization promoting Asian American awareness and community building on campus*

- Managed a **$4K** annual budget for cultural events and club activities, implementing digital tracking systems to improve expense transparency by **40%**
- Organized AAPI cultural week through panels and exhibits that attracted **100+** attendees and engaged **10+** alumni

President — George Fox ACM Chapter August 2022 – May 2023
About: *A student chapter of the Association for Computing Machinery dedicated to supporting women in computing*

- Led a team of **4** officers to organize **12+** technical workshops and speaker events, increasing member engagement by **40%** for annual hackathon event of **20+ participants**
- Delivered **5+** weekly production builds for ACM-related websites using **React** and **Node/Express**, streamlining club marketing and reducing administrative workload by **90%**
- Managed a total of **$2K** operating budget and achieved **90%** increase in alumni engagement rate (**22%** cumulative) for an annual hackathon through strategic partnerships with locally-grown, Oregon-based company, Silverpine