

# RUI TAO

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## EDUCATION

### University of Washington

M.S. in Electrical and Computer Engineering, GPA: 3.97/4.0

Sep 2023 - Jun 2025(Expected)

Seattle, WA

### Shandong University

M.S. in Computer Science and Technology

Sep 2017 - Jun 2020

Qingdao, China

### Ocean University of China

B.S. in Marine Science

Aug 2013 - Jun 2017

Qingdao, China

## WORK EXPERIENCE

### SLB (Schlumberger)

Software Engineer Intern — AI/Full-Stack

Sep 2024 - Dec 2024

Beijing, China

- Architected a high-performance well log platform with **React/Flask/MongoDB** stack on **Azure**, featuring well log generation, model lifecycle management, interactive data visualization, and real-time task monitoring.
- Engineered parallel task processing system using **Python multiprocessing** to bypass GIL, achieving 8x throughput for concurrent tasks (well log generation/model training/model prediction).
- Implemented well log resolution enhancement using **Autoencoder-SVR** hybrid model with **TensorFlow**.
- Optimized system performance through multi-level caching, file-based atomic operations, and process-safe queues.

### Alibaba Group

Software Engineer Intern — Game Server Development

Jun 2024 - Sep 2024

Guangzhou, China

- Implemented an efficient pathfinding system for an SLG game using an optimized **A\* algorithm** on a **Lua** and **C++** hybrid model, capable of handling a 1500×1500 hex grid within **200ms**, with path smoothing optimization.
- Developed a **Roguelike Shooter** demo using **Lua** and a **custom timer** with adjustable timescale, pause, and resume.
- Created the **game replay system** for online card game **Morimens**, with the **server** storing game frame instructions and states on an **OSS service**, and the **client** retrieving data directly from OSS and replaying.
- Optimized the **social system** for **Morimens** with **segmented caching**, **asynchronous preloading**, and **selective retrieval**, reducing **avg** and **max RPC times** by **83.2%** and **99.1%**, earning positive feedback.

### Parkalytics

UW ECE Capstone Project

Jan 2024 - Jun 2024

Seattle, WA

- Processed video frames and converted tracking datasets to object detection datasets, correcting annotations.
- Merged **VisDrone** and custom datasets into a comprehensive traffic dataset with data augmentation.
- Trained and evaluated models using **YOLOv8x** and **GELAN-C**, achieving mAP@0.50 of **0.545** and **0.52**.
- Integrated **YOLOv8/9** with **ByteTrack** for vehicle tracking and counting in video footage.

## PROJECTS

### AI-Enhanced Mock Interview Platform | React, TypeScript, NestJS

Nov 2024 - Present

- Architected a microservices platform using **React**, **NestJS**, and **Python FastAPI**, containerized with **Docker**.
- Implemented realtime video with **WebRTC**, **WebSocket**, and **Socket.IO**, managed state via **Redux**.
- Developed realtime speech recognition and an AI-driven post-interview analysis using **OpenAI**, and **LangChain**.
- Designed **RESTful APIs** with authentication using **Firebase Auth**, and data persistence with **MongoDB**.
- Deployed the application on **Google Cloud Platform** using **GitHub Actions** for CI/CD automation.

### P2P Video On-Demand Web Server | C++, Network, Concurrency

Dec 2023 - Apr 2024

- Developed a high-concurrency server using **Reactor**, **Epoll**, **thread pools**, and **RAII**-based connection pools.
- Engineered secure user authentication using **MySQL**, **Redis** with 5-minute **SessionIDs**, and a **Bloom filter**.
- Applied **regular expressions** and **state machines** to parse and manage HTTP requests.
- Created an **asynchronous logging system** using a singleton pattern and a blocking queue.
- Enabled reliable inter-node video transmission via **UDP** with retransmission and sliding windows.

## TECHNICAL SKILLS

### Languages

C/C++, Python, JavaScript, TypeScript, Go, Lua, Java, C#, Kotlin, CUDA

### Web Development

React, Redux, Zustand, Next.js, Vue.js, Angular, Tailwind CSS, HTML/CSS

### Backend Development

Express, NestJS, Django, Flask, FastAPI, Spring Boot, Gin, gRPC

### Data Management

SQL (MySQL, PostgreSQL), MongoDB, Redis, Mongoose, Elasticsearch

### DevOps & Tools

Git, Docker, CI/CD, Kubernetes, AWS, Google Cloud, Terraform, Jenkins