Rukun (Eric) Qiao

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Profile

PhD in AI & Computer Vision with deep algorithmic expertise and rigorous research mind set. **Proven industry experiences** translating advanced algorithms into scalable, production-grade solutions. **Self-driven full-stack developer** building production-ready web applications.

Technical Skills

Languages: Python, JavaScript (ES6+), C++, SQL.

Web Development & APIs: React, React Native, Expo, FastAPI (RESTful API design & JWT auth).

Machine Learning & AI: PyTorch, Scikit-learn, Transformers (GPT-4 API), Deep Learning.

Data & Visualization: PostgreSQL, pandas, NumPy, OpenCV, Open3D.

DevOps & Cloud: Git, Docker, Github Actions, Azure Functions & Static Web Apps.

Professional Experience

Independent Developer | Household Inventory Management App

Mar. 2025 – Now

Tech Stack: React Native, FastAPI, PostgreSQL, Github Actions

- Engineered a scalable full-stack solution with React Native (Expo) front end, FastAPI back end and PostgreSQL persistence.
- Secured all RESTful endpoints using JWT authentication to protect user accounts and sessions.
- Architected an offline-first draft management system via Context API, streamlining bulk data entry workflows.
- Designed modular hooks for future AI/LLM integration, defining OpenAI GPT-4.* API injection points and prompt response interfaces.
- Automated CI/CD pipeline (GitHub Actions – Azure Function & Static Web Apps) for test – build -deploy.

Machine Learning Engineer | SenseTime

Sep. 2020 – Jul. 2021

Tech Stack: Python, PyTorch, OpenCV, NumPy, CUDA, Git

- Engineered a deep learning-based multi-view stereo pipeline using MVSNet to reconstruct high-fidelity 3D meshes from smartphone image sequences.
- Built interactive visualization and debugging tools with Open3D for rapid model inspection and error analysis.
- Optimized inference efficiency by integrating classical stereo matching algorithms with ML models, reducing computational load and model size for mobile deployment.

- Delivered the solution as a modular Python package with well-documented APIs to streamline integration into the mobile app.

Computer Vision Engineer | BOE Technology *Oct. 2018 – Sep. 2019*

Tech Stack: C++, OpenCV, MATLAB, ROS

- Coordinated cross-functional teams to develop a visual navigation system for autonomous cleaning robots, aligning perception, planning and hardware modules.
- Installed and calibrated stereo camera rigs and ancillary sensors, performing intrinsic/extrinsic calibration to achieve sub-millimetre pose accuracy.
- Implemented C++ modules for real-time sensor data acquisition and preprocessing, improving data reliability under varying lighting conditions.

Education

Peking University | PhD in Artificial Intelligence **Beijing, China**

School of Intelligence Science and Technology *Sep. 2016 – Jul. 2024*

Kyushu University | Visiting Scholar Program **Fukuoka, Japan**

Graduate School of Information Science and Electrical Engineering *Sep. 2018 – Mar. 2019*

Peking University | BSc in Artificial Intelligence **Beijing, China**

School of Electronic Engineering and Computer Science *Sep. 2012 – Jul. 2016*

Research Achievements

Research Highlights

Keywords: Computer Vision, Deep Learning, Robotics, 3D Scanning

- Developed a disparity estimation network leveraging temporal correlation in structured light systems, reducing computing cost by about 50% for robotic vision applications.
- Pioneered the integration of neural implicit functions for structured light systems, enhancing depth estimation accuracy with minimal input patterns, and provide insightful research direction for structured light researches.

Publications

- **Rukun Qiao**, Hiroshi Kawasaki and Hongbin Zha, "TIDE: Temporally Incremental Disparity Estimation via Pattern Flow in Structured Light System," in *IEEE Robotics and Automation Letters*, pp.5111-5118, April 2022.
- **Rukun Qiao**, Hiroshi Kawasaki and Hongbin Zha, "Online Adaptive Disparity Estimation for Dynamic Scenes in Structured Light Systems," in *IEEE/RSJ International Conference on Intelligent Robotics and Systems,* 2023.
- **Rukun Qiao**, Hiroshi Kawasaki and Hongbin Zha, "Depth Estimation in Structured Light Systems via Neural Implicit Functions," in *International Conference on 3D Vision,* 2024.