Rukun (Eric) Qiao | Machine Learning Engineer

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Profile

Hands-on machine learning engineer with end-to-end experience in robotics and 3D vision. **PhD research** centered on multi-view 3D reconstruction, sensor fusion, and deep learning for geometric perception, specialized in **predictive modeling and transformer model for data-driven decision making**. **Strong software engineering skills** across algorithms, application development, and data workflows; write clean, maintainable code and deliver reliably with testing and automation. **Full-stack developing experience** to move ideas from prototype to production. **Proactive engineer with an analytical mindset** who turns ambiguous problems into clear metrics, dashboards, and experiments, and communicates insights to guide data-driven decisions. **Passionate about using data and machine learning to deliver measurable improvements in business performance and user experience.**

Technical Skills

- **Languages**: Python, JavaScript, C++, C#, Java
- **GenAI**: LLMs, Retrieval-Augmented Generation (RAG)
- **Machine Learning**: PyTorch, TensorFlow, Scikit-learn
- **Data Platform**: PostgreSQL, VectorDB, Databricks, Snowflake, Spark
- **Experimentation**: A/B Test, Power Analysis, Statistic Tests
- **Full-stack Development**: React, Node.js, RESTful APIs, GraphQL
- **DevOps & Cloud**: Git, Docker, Github Actions, Azure, AWS
- **Data Visualization**: PowerBI, Matplotlib, Seaborn, MATLAB, OpenCV, Open3D

Soft Skills

- Agile development
- Ownership mindset
- Learning agility
- Problem solving
- Coaching & mentoring
- Analytical mindset
- Business argument

Education

Peking University | PhD in Artificial Intelligence — **Beijing, China**
QS World University Rankings #14 | School of Intelligence Science and Technology — *Sep. 2016 – Jul. 2024*

Peking University | BSc in Artificial Intelligence — **Beijing, China**
School of Electronic Engineering and Computer Science — *Sep. 2012 – Jul. 2016*

Kyushu University | Visiting Scholar Program — **Fukuoka, Japan**
Graduate School of Information Science and Electrical Engineering — *Sep. 2018 – Mar. 2019*

Professional Experience

Machine Learning Engineer | Yureca Technology — *Oct. 2024 – Now*
Tech Stack: React Native, FastAPI, PostgreSQL, Github Actions, Azure, AWS, LLMs, RAG, VectorDB

- **Led the development of an end-to-end household inventory management system**, delivering data-driven insights through automated recommendations and reports.
- Engineered **a production-ready full-stack architecture** across mobile front end, backend services, and PostgreSQL persistence, with JIRA-managed agile delivery.
- Developed **machine learning models to learn user consumption patterns and item features**, enabling purchase cycle prediction, restock recommendations, and automatic item annotation, with **online adaptation via user behavior tracking and CI/CD pipelines**.
- Implemented **GenAI and RAG pipelines** to support natural language item entry and proactive, context-aware recommendations based on user inventory state.
- Designed **ETL pipelines, dashboards, and periodic reports**, integrating backend metrics to monitor system performance, resource usage, and cost efficiency.

Software Engineer | CLCN *Mar. 2025 – Now*

Tech Stack: React Vite, Node.js, Figma, Github Actions

- Contribute to **the front-end development of an internal ERP web app** that creates a transparent, measurable collaboration framework and standardizes handoffs.
- Transform manual processes into **automated, step-based workflows** that deliver guidance, progress tracking, and reminders, aligned with clear UI flows/specs defined by business and design teams.
- **Build collaboration features around volunteer profiles and availability** so organizers can assemble teams, send invitations, and coordinate tasks transparently.
- Establish **unit and component tests for critical flows**, define QA checklist and regression suites.
- Instrument **data capture with data tracking** to support post-event reviews and training, laying the foundation for analytics-driven improvements and policy updates.

Before the completion of PhD

Machine Learning Engineer | SenseTime *Sep. 2020 – Sep. 2021*

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

- Built an automated multi-sensor data pipeline for **mobile 3D capture**, including standardizing images, time-aligning IMU data, and extracting features, to power downstream 3D reconstruction models.
- Acted as a professional consultant, engaging stakeholders for **requirement collection and success-metric alignment, setting acceptance thresholds and release gates to app performance**.
- Developed a **deep-learning multi-view model** to reduce reconstruction uncertainty, and enabled a **post-deployment fine-tuning loop** on user-returned images.
- Optimized inference efficiency by integrating classical 3D matching algorithms with deep learning models, **reducing computational load for mobile deployment**.
- **Delivered the solution as a modular Python package with clear docs and tests**, and exposed a lightweight REST/HTTP wrapper to streamline integration with the mobile app and internal tooling, enabled downstream 3D-model-based features.

Computer Vision Engineer | BOE Technology *Sep. 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 cameras and supportive sensors, performing intrinsic and extrinsic calibration to **achieve sub-millimetre pose estimation accuracy in production environments**.
- Implemented **C++ modules for real-time sensor data acquisition and preprocessing**, improving data reliability under varying lighting conditions, integrated into the commercial cleaning-robot line.
- Produced technical documentation and conducted workshops to help engineering and operations teams **interpret system outputs and safely adjust parameters** for different deployment scenarios.

Research Achievements

PhD research in **robotics and 3D perception**, with a focus on modeling **uncertainty in real-world sensor data**. Designed efficient deep learning methods that balance **accuracy, robustness, and computational cost**, enabling reliable perception under practical system constraints.

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.