Ruiqi Wang

Ph.D. Candidate in Computer Engineering
LinkedIn: www.linkedin.com/in/rickywrq/

Email: ruiqi.w@wustl.edu
Website: rickywrq.github.io/ruiqiwang/

EDUCATION

Washington University in St. Louis — St. Louis, MO
Ph.D. in Computer Engineering; GPA: 4.0/4.0 — *Sep. 2020 – Present*

- **Advisor**: Chenyang Lu
- **Expected Graduation**: Dec. 2025

University of Michigan - Ann Arbor — Ann Arbor, MI
B.Sc. in Computer Engineering; GPA: 3.8/4.0 — *Sep. 2018 – Apr. 2020*

Shanghai Jiao Tong University — Shanghai, China
B.Sc. in Electrical and Computer Engineering; GPA: 3.7/4.0 — *Sep. 2016 – Aug. 2020*

AWARDS & CERTIFICATIONS

Best Student Paper Award: IEEE Real-Time Systems Symposium (RTSS '23)

Fullgraf Fellowship: Graduate research fellowship from Fullgraf Foundation (2022 – Present)

PUBLICATIONS

- **Wang, R.**, Wang, Z., Gao, P., Li, M., Jeong, J., Xu, Y., ... & Lu, C. (2024). Real-Time Video-based Human Action Recognition on Embedded Platforms. arXiv preprint arXiv:2409.05662. (In submission)

- Qiu, J., **Wang, R.**, Hu, B., Guérin, R., Lu, C. (2024). Optimizing Edge Offloading Decisions for Object Detection. 2024 IEEE/ACM Symposium on Edge Computing (SEC '24).

- **Wang, R.**, Liu, H., Qiu, J., Xu, M., Guérin, R., Lu, C. (2023). Progressive Neural Compression for Adaptive Image Offloading under Timing Constraints. In 2023 IEEE Real-Time Systems Symposium (RTSS '23).
  Best Student Paper Award

- Zhang, J., Dai, R., Rjob, A., **Wang, R.**, Hamauon, R., Candell, J., ..., Lu, C. (2023). Contact Tracing for Healthcare Workers in an Intensive Care Unit. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies. (Ubicomp-ISWC '23)

- Guillamet, M. C. V., Rjob, A., Zhang, J., Dai, R., **Wang, R.**, Damulira, C., ..., Fraser, V. (2023). Leveraging Bluetooth low-energy technology to improve contact tracing among healthcare personnel in hospital setting during the coronavirus disease 2019 (COVID-19) pandemic. Infection Control & Hospital Epidemiology.

- Qiu, J., **Wang, R.**, Chakrabarti, A., Guérin, R., Lu, C. (2022). Adaptive edge offloading for image classification under rate limit. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems.

SELECTED PROJECTS

- **Smart Kitchen**: A live, video-based human action recognition system (optical flow, video feature extraction, action recognition transformer, object detection, etc.) designed to assist users with cognitive impairments to complete tasks independently. It leverages **Transformer**-based LSTR, MViT, and **fine-tuned Vision-Language Models** (e.g., Qwen-VL, LLaVA, GPT4o) to understand cooking actions and provide real-time reminders for omissions or unsafe behaviors, enhancing safety and independence at home.

- **AI-Driven MDS Diagnostics**: Utilizing ML to diagnose Myelodysplastic Syndrome (MDS), a type of blood cancer, from digitized blood and bone marrow aspirates, as well as multiparameter flow cytometry data. Leveraging **object detection** (YOLO) for cell segmentation and **vision foundational models** (ViT, BEiT, etc.) for cell feature encoding, this approach automates the detection of subtle morphologic and antigen expression patterns, improving MDS screening and reducing the need for invasive bone marrow biopsies.

- **Real-time Edge Computing**: Lightweight algorithms for efficient encoding (utilizing a **rateless autoencoder**) and optimal task offloading (**Deep Q-Learning**) on embedded systems (Raspberry Pi 4) under network constraints, e.g., token bucket, or time constraints, e.g., transmission deadline.

- **Indoor Localization and Contact Tracing**: An automated contact tracing system for healthcare workers in hospital settings leverages embedded devices (dozens of Raspberry Pi Zeros) and wearable BLE beacons to track human contact and perform contact tracing after a positive diagnosis. The system has been deployed and evaluated in a real-world ICU at Barnes Jewish Hospital, where 187 healthcare workers participated during the COVID-19 period, and can be generalized to other infectious diseases.

Teaching Experience

Teaching Assistant, Fall 2023: CSE 521S: Wireless Sensor Networks

Teaching Assistant, Spring 2022: CSE 520S: Real-Time Systems

Relevant Courses

Washington University in St. Louis: Advanced Operating Systems, Data Mining, Computer Vision, Computer Systems Architecture, Machine Learning

University of Michigan - Ann Arbor: Computer Architecture, Computer Vision, Intro to Embedded System Design, Intro to Operating Systems, Computer Networks, Intro to Machine Learning, Linear System Theory

Technical Skills

Programming Languages: Python, C++

Machine Learning and Artificial Intelligence:

- **Frameworks**: PyTorch, TensorFlow, Keras, OpenCV
- **Tasks**: Image Classification, Object Detection, Human Action Recognition (HAR).
- **Models**: Transformer, Convolutional Neural Networks (CNN), Vision Language Models (VLM).

Embedded Systems: Raspberry Pi, Nvidia Jetson, Edge AI Optimization (Quantization, Pruning, Distillation)