Qi (Leo) Yu

Portfolio: yq-leo.github.io

Email: qiyu6@illinois.edu
LinkedIn: linkedin.com/in/qi-leo-yu/

EDUCATION

University of Illinois Urbana-Champaign — Champaign, U.S.
Master of Computer Science; GPA: 4.0/4.0 — *Aug. 2022 - Dec. 2023*
Courses: *Distributed Systems, Database Systems, Applied Parallel Programming, Manycore Parallel Algorithms, Machine Learning*

Dalian University of Technology — Dalian, China
Bachelor of Engineering - Computer Science; GPA: 90.4/100, 4.04/5.0 — *Sept. 2018 - Jul. 2022*
Courses: *Computer Architecture, Numeric Methods, Operating Systems, Algorithms & Data Structures, Computer Networks, OOP*

University of California, Los Angeles — Los Angeles, U.S.
Summer Session - Algorithm and Complexity; GPA: 4.0/4.0 — *Jun. 2020 - Sept. 2020*

SKILLS SUMMARY

- **Languages:** C++, Python, Java, HTML&CSS, JavaScript, SQL, PHP
- **Frameworks:** Bootstrap, CUDA, PyTorch, OpenCV, Numpy, Z3-solver, Gurobi
- **Tools:** Node.js, MySQL, Git, AWS
- **Platforms:** Linux, Windows, MacOS

PROJECTS

- **RateMyRSOs - A review and rating website for RSOs at UIUC**: Built a full-stack web application, RateMyRSOs, which allows students at UIUC to post reviews and ratings to UIUC's different Registered Student Organizations (RSOs). **Tech**: MySQL, HTML&CSS, Bootstraps, JavaScript, Node.js, GCP *(Jan. 2023, in progress)*

- **Competition - Optimizing forward-pass of LeNet-5 using CUDA (Parallel Algorithms, DNN)**: Implemented and optimized the forward convolution layers of a modified LeNet-5 using CUDA C++. Optimizations beat 90% fellow competitors in terms of speed. **Tech**: CUDA, C++, Profiling, NVIDIA Nsight Compute *(Oct. 2022)*

- **Drug-drug Interaction Detection through Drug Knowledge Graph (Data Mining, Knowledge Graph, Graph Neural Network)**: Constructed large-scale drug knowledge graph and proposed a DNN based on Conv-LSTM to predict drug-drug interaction with AUPR of 0.99 and MCC of 0.88. **Tech**: TensorFlow, PyTorch, PHP, SPARQL. *(Mar. 2022)*

- **Intelligent Handling Robot (Computer Vision, Facial Recognition, Robotics)**: Led a team of five to program an intelligent robot capable of carrying the pillar with the correct facial image to the designated area. Project scored the highest in the class. **Tech**: Android Development, PyTorch, OpenCV, Raspberry Pi, Socket. *(Jul. 2021)*

- **Anomalous Behavior Detection under UAV Scenarios (Computer Vision, Deep Learning, Drone Platform)**: Led a team of four to develop a deep-learning-based algorithm for detecting abnormal human behavior under an UAV perspective; Boosted model performance to 0.76 mAP and 0.85 mAR through a customized game-based dataset. **Tech**: PyTorch, OpenCV. *(Feb. 2020)*

EXPERIENCE

Research - Prioritized List Scheduling — Dalian University of Technology
Undergraduate Research Assistant — *Feb. 2022 - Jul. 2022*
- **IP**: Encoded priority assignment problem for a DAG task into an Integer Programming (IP) formulation.
- **Gurobi - Python**: Designed an iterative algorithm to derive minimum WCRT using Python Gurobi solver.
- **Result**: Proposed algorithm capable of solving IP formulation optimally by involving only 12.67% variables on average.

UCInspire Summer Research - Distributed Personalized ML — University of California, Irvine
Undergraduate Researcher — *Jun. 2021 - Oct. 2021*
- **Distributed ML**: Proposed a specialized machine learning schema for resource-constrained distributed systems by exploiting temporal correlations among data and enabling local training.
- **Test on HAR**: Implemented a two-stage system in PyTorch for task-offloading and tested it on the HAR dataset.
- **Result**: Proposed method improved resource utilization by 91% and reduced network communications by 84%.

Research - Static Job-shop Scheduling — Dalian University of Technology
Undergraduate Researcher — *Nov. 2020 - Jul. 2021*
- **JSP**: Formulated the static Job-Shop Scheduling Problem (JSP) into a programmable model in Factor Graph.
- **Max-sum Algorithm**: Proposed and Implemented a derivative of the distributed max-sum algorithm in C++, which is commonly used for message passing through multi-agent systems, to iterate on the formulated Factor Graph model.
- **Result**: Proposed algorithm capable of resolving large-scale JSPs in an industrial environment with a 3-time faster speed than that of state-of-the-art heuristic methods.

PUBLICATIONS

- **Journal**: Chang, S., Bi, R., Sun, J., Liu, W., **Yu, Q.**, Deng, Q., & Gu, Z. (2022). Towards Minimum WCRT Bound for DAG Tasks under Prioritized List Scheduling Algorithms. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems.*

- **Patent**: **Qi Yu**, Yuhan Wang, Jinghao Sun. 2021. A Distributed Max-Sum Algorithm for Job Shop Scheduling in an Industry 4.0 Environment, CN 202110789792.5.