

Qi (Leo) Yu

Portfolio: [yq-leo.github.io](https://github.com/yq-leo)

Email: qiyu6@illinois.edu

LinkedIn: [linkedin.com/in/qi-leo-yu/](https://www.linkedin.com/in/qi-leo-yu/)

EDUCATION

- University of Illinois at Urbana-Champaign** Champaign, U.S.
Master of Computer Science; GPA: 3.94/4.0 Aug. 2022 - May. 2024
Courses: CS446 Machine Learning(A), CS543 Computer Vision(A), CS508 Manycore Parallel Algorithms(A)
- Dalian University of Technology** Dalian, China
Bachelor of Engineering - Computer Science; GPA: 90.4/100, 4.04/5.0 Sept. 2018 - Jul. 2022
Courses: Machine Learning, Artificial Intelligence, Numerical Analysis, Information Retrieval, Linear Algebra, Calculus
- 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

- Programming:** Python, C++, Java, Golang, JavaScript
- ML Dev & Databases:** PyTorch, OpenCV, CUDA, MySQL, MongoDB, Neo4j
- Web Dev & Cloud:** HTML, CSS, React, Node.js, Express.js, Next.js, AWS, GCP
- Miscellaneous:** Git, Linux, Z3-solver, Gurobi, L^AT_EX

PROJECTS

- Parallelization over forward-pass of LeNet-5 (Parallel Algorithms, DNN):** Implemented and optimized the forward pass of convolution layers of a modified LeNet-5 through multiple parallelization techniques including input matrix unrolling, fixed point arithmetic, and joint register & shared memory tiling SGEMM. Optimizations achieved up to 10x speed up compared to the baseline. **Tech:** CUDA, C++, Profiling, NVIDIA Nsight Compute (Oct. 2022)
- Intelligent Handling Robot (Computer Vision, Facial Recognition, Robotics):** Led a team of five students to program an intelligent robot capable of detecting and carrying the pillar with the correct facial image to the designated area automatically; Developed a Java mobile application used for controlling robots in a robots boxing competition; Project scored the highest in the class. **Tech:** Android Development, PyTorch, OpenCV, Raspberry Pi, Socket. (Jul. 2021)
- Anomalous Behavior Detection under UAV Scenarios (Object Detection, Deep Learning, Drone Platform):** Led a team of four to develop a derivatives of YOLOv3 for detecting abnormal human behavior under an UAV perspective; Boosted the model's performance to 0.76 mAP and 0.85 mAR through a customized game-based dataset. **Tech:** PyTorch, OpenCV. (Feb. 2020)

EXPERIENCE

- Minimum WCRT under Prioritized List Scheduling** Dalian University of Technology
Undergraduate Research Assistant Feb. 2022 - Jul. 2022
 - ILP:** Encoded the priority assignment problem for DAG tasks into an Integer Linear Programming (ILP) formulation.
 - WCRT:** Designed an iterative algorithm to derive the minimum WCRT under PLS algorithm.
 - Result:** Proposed algorithm solved the ILP formulation optimally by involving only 12.67% variables on average.
 - Responsibilities:** Implementation of proposed algorithms, Conducting experiments under various settings
- Drug-drug Interaction Detection in Drug Knowledge Graph** Dalian University of Technology
Undergraduate Project Jan. 2022 - June. 2022
 - Drug KG:** Constructed a large-scale drug knowledge graph by joining multiple pharmaceutical databases (DrugBank, PharmGKB, etc.) based on drug-related entity alignment.
 - Model:** Implemented and compared multiple embedding algorithms on the constructed KG, and proposed a lightweight Conv-LSTM model to predict drug-drug interaction based on drug embeddings.
 - Result:** Proposed model outperformed existing end-to-end GNN models by 6% on MCC and 2% on AUPR.
- UCInspire Summer Research - Personalized ML for Edge Computing** University of California, Irvine
Undergraduate Research Project Jun. 2021 - Oct. 2021
 - ML for Edge:** Proposed a specialized machine learning schema for resource-constrained edge computing systems by exploiting temporal correlations among stream data.
 - Model:** Proposed a two-stage classifier model for client-side training and intelligent task-offloading.
 - Result:** Prototype model significantly improved network congestion and resource utilization on client side.
- Research - Static Job-shop Scheduling** Dalian University of Technology
Undergraduate Research Project Nov. 2020 - Jul. 2021
 - JSP:** Formulated the static Job-Shop Scheduling Problem (JSP) into a programmable model on factor graph.
 - Model:** Proposed a derivative of the distributed max-sum algorithm to solve the NP-hard problem in a heuristic way.
 - Result:** Proposed algorithm resolved large-scale JSPs in an industrial environment setting with a 3-time faster speed than existing heuristic methods.

PUBLICATIONS

- Conference:** 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*.