

Yiqian Li

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EDUCATION BACKGROUND

The Chinese University of Hong Kong (CUHK), China B.Sc. in Computer Science and Engineering GPA: 3.6/4.0	09/2020 – 07/2024
The University of California, Irvine (UCI), United State GPA: 4.0/4.0	01/2023 – 06/2023

RESEARCH INTEREST

Computer Vision | Reinforcement Learning | Robotics

PUBLICATIONS

- [1] Aojun Jiang, Miao Hao, **Yiqian Li**, Jiaqi Wang, Chunfeng Yue, Zongjie Huang, Ying Yang, Meng Ma, Qifeng, Lyu, Yu Sun, Zhuoran Zhang, "Occlusion-Aware Multi-Object Tracking for Point-of-Care sperm Analysis Using Smartphone Imaging", submitted to **IEEE Transactions on Automation Science and Engineering (IF 6.636)**.
- [2] Zhijing Li, Qiwei Fu, Zhijun Huang, Jianbo Yu, **Yiqian Li**, Yuanhao Lai, Yuchi Ma, Pinjia He, "Revisiting Log Parsing: The Present, The Future, and The Uncertainties", **IEEE Transactions on Reliability (IF 5.883)**.
- [3] **Yiqian Li**, Miao Hao, Zhuoran Zhang, "Pseudo Labeling Semi-supervised Classification for Sperm Morphology Analysis Using Smartphone Imaging", **under review**.
- [4] Yifan Mei*, **Yiqian Li***, Xiaoyu Shi, "A Diffusion Probabilistic Model for Medical image Denoising and Synthesis", **under review**.

RESEARCH EXPERIENCE (SELECTED)

Medical Image Synthesis and Denoising based on Diffusion Probabilistic Model [4]

Prof. Xiaoyu Shi / UCI

06/2023 - Present

- Establish and validate a 2D medical image synthesis framework based on a diffusion model, covering a forward Gaussian noise process and a reverse denoising process using the transformer-based diffusion model;
- Evaluate the quality, diversity, and authenticity of the synthesized medical images based on a set of fit-for-purpose metrics, covering X-ray, MRI and CT images.

Sperm Morphology Analysis under Smartphone Imaging [3]

Prof. Zhuoran Zhang / CUHK

12/2022 - Present

- Implement a specialized U-net network to segment every semen image into single sperm images;
- Design a pseudo label generation framework by applying DBSCAN and Agglomerative Clustering algorithms on morphological standard sperm images and unlabeled sperm images;
- Implement Resnet and Vision-transformer as semi-supervised classification models for sperms image sets with pseudo labels to calculate the morphological normal sperms ratio of the patient.

Sperm Video Segmentation and Tracking [1]

Prof. Zhuoran Zhang / CUHK **Ph.D. student Aojun Jiang** | University of Toronto

08/2022 – 12/2022

- Optimized the up-sampling process in U-Net to accelerate segmentation of sperms in each video frame;
- Enhanced the occlusion-flag-enabled PFT model for improved recognition and tracking of sperms in videos by modifying the occlusion-judge mechanism to analyze the concentration and motility of sperms;
- Leveraged TensorRT for model acceleration.

Design of a Log Detection and Analysis System for Huawei Cloud Service [2]

Prof. Pinjia He / CUHK

Ph.D. Zhijing Li | CUHK

Huawei Cloud Service Lab

09/2021 – 07/2022

- Implemented a semantic parser to parse logs; applied word2vec to calculate semantic similarity of logs to agglomerate logs from the same root cause;
- Extracted invariants among logs and monitor the dependency of invariants to inform log detection;
- Analyzed false detection by log parsing algorithms such as Drain, AEL, and IPLoM; Corrected some ground truth in log parsing datasets;
- Evaluated the accuracy and efficiency of CNN, auto decoder and LSTM algorithms for automated anomaly detection of logs;
- The log root cause detection system is implemented into Huawei Cloud Service.

PROJECT (SELECTED)

Reinforcement Learning for Optimal Traffic Signal Control

Prof. Xiaohui Xie / UCI

03/2023 – 05/2023

- Designed, implemented, and validated in Python a set of reinforcement algorithms for optimal traffic signal control so as to minimize waiting time of vehicles;
- Simulated cross-road traffic condition using Simulation of Urban Mobility (SUMO), allowing vehicle flow visualization;
- Employed 1) Deep Q-network, Double Deep Q-network, Dueling Deep Q-network, and Proximal Policy Optimization (PPO) reinforcement learning algorithms, and 2) various exploration strategies including greedy, epsilon-greedy, and upper confidence bound (UCB) to drive control, followed by a comparative study on the effectiveness and efficiency.

COMPETITION

DJI RoboMaster Robotics Competition

Prof. Simon Pun / CUHK

10/2020 – 05/2021

- Joined a multi-disciplinary team to prepare for the DJI Robomaster competition, developing and operating six robots that launch projectiles at opponent in order to deduct Hit Points;

- Established a simulation environment in Gazebo simulator to facilitate the intelligent robot development and testing;
- Analyzed QMIX and VDN algorithms for intelligent vehicle decision, covering engineering (loading and transporting bullets), infantry (fight with other robots), supply (ammunition management) and aerial (air combat) robots;
- Enabled route planning via A* algorithm, Dijkstra's algorithm, and a greedy heuristic.

SKILLS

Programming Languages: C/C++ | Java | Python | MATLAB | SQL | ARM Assembly | VHDL | Verilog HDL

Libraries: PyTorch | TensorFlow | OpenCV | ROS | Scikit-Learn | LibTorch