# HAO REN

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## EDUCATION

**Carnegie Mellon University**                                                          **May 2022 - Dec 2023 (Expected)**
Master of Science in Mobile and IoT Engineering

**National University of Singapore**                                                          **Aug 2018 - May 2022**
Bachelor of Engineering (Computer Engineering), with Honors (Distinction)
- Courses: Real-time Operating System, Software Engineering and OOP, Database Systems Implementation, Parallel Computing

## WORK EXPERIENCE

**SP Digital, AI Engineering Intern**                                                          **Jan 2021 - Jun 2021**
- Developed a dashboard website that enables customer users to visualize the AI model's results and to trace and manipulate pass records; Constructed an ad-hoc database using Postgres and deployed the website on the intranet using Kubernetes.
- Explained the AI model's predictions using Tree SHAP values.
- Implemented a PyTorch pipeline for anomaly detection project, integrating modularized training and testing stages.

**Jiaxing Zhongke Opto-Electronics Engineering Center, Software Intern**                    **May 2019 - Aug 2019**
- Built a special image manipulation software with Qt5 that additionally supports image segmentation, greyscale, and Laplacian sharpening for internal usage.

## RESEARCH EXPERIENCE

**A\*STAR Institute for Infocomm Research (I2R), Research Assistant**                    **July 2022 - Sep 2022**
- Researched a novel and more computationally efficient group-wise pruning method for convolutional network models.
- Implemented group-wise regular pruning in code and tested it on state-of-the-art datasets.

**National University of Singapore, Research Assistant (with Prof. Mehul Motani)**          **Aug 2021 - Aug 2022**
- Evaluated CURATE.AI, a novel personalized dosage recommendation method, on a large medicine dataset (MIMIC-IV).
- Collaborated with hospital doctors to give dosage recommendations for real Diabetes and Hypertension patients.

**ROSE lab, Nanyang Technological University, Research Assistant (with Prof. Alex Kot)**    **Aug 2021 - Aug 2022**
- Obtained nearly perfect accuracy in detecting AI synthesized voices by preprocessing audio with MFCC/MEL and transferring it into frequency-domain pictures.
- Improved occluded person re-identification model's mAP metric by 2-3% on PartialLIDS and PartialREID datasets.
- Initiated a new large-scale occluded person re-identification dataset using the Character Creator 4.

## ACADEMIC PROJECT

**Proxy Lab**                                                                          **Aug 2022 - Aug 2022**
- Built a proxy server program with cache that handles HTTP communication between server and multiple clients concurrently.

**Malloc Lab**                                                                          **Jun 2022 - July 2022**
- Wrote a C program to mimic C's Dynamic Memory Allocation library from scratch; Brought the utilization to > 74% by eliminating footers in boundary tags and decreasing the minimum block size.

**Computer Engineering Capstone Project**                                                   **Aug 2021 - Nov 2021**
- Coordinated with five peers to develop a dancing motion recognition system from scratch, including hardware sensors, wireless communication, machine learning models, and visualizing software.
- Conducted the machine learning part and achieved 100% accuracy in the final evaluation.

**Independent Software Development Project**                                                   **Aug 2019 - Nov 2019**
- Developed a student assist software named "Gazeeebp" to help students plan academic journeys and check course information.

## SKILLS

**Programming Language & Development Platform:** Python, C, Java, C++, assembly, JavaScript, TypeScript, HTML; Docker
**Machine Learning:** PyTorch, TensorFlow, scikit-learn
**Database Management System & Parallel Computing:** SQL, PostgreSQL; CUDA, OpenMP programming, MPI programming