Qiyao Xue

| Personal website | Email: 19083647d@connect.polyu.hk | Phone: +86 13804805360 |

EDUCATION

University of Pittsburgh, United State of America Aug 2024 - present
Ph.D. in Electrical and Computer Engineering

The Hong Kong Polytechnic University, Hong Kong Sep 2019 - Jun 2023
BEng in Electrical Engineering, First Class Honor (GPA: 3.74/4.3, ranking: top 2%, 11 awards, 2 dean lists)
Minor in Applied Mathematics (GPA: 3.86/4.3)

University of Maryland, USA Jan 2022 - Jun 2022
Exchange Program in Electrical and Computer Engineering, 2 students selected in PolyU

University of Cambridge, UK Jul 2021 - Aug 2021
Engineering Summer Program, 4 students selected in department

INTERNSHIP EXPERIENCE

Research Assistant, Pitt Intelligent System Lab, University of Pittsburgh, US Aug 2024-present

Project: PhyT2V: LLM-Guided Iterative Self-Refinement for Physics-Grounded Text-to-Video Generation

- Proposed **PhyT2V**, a training-free iterative self-refinement approach that can effectively enhance the temporal causality and physical realism of generated videos by diffusion models embedded with the CoT and step-back reasoning capabilities of LLMs
- Accepted to **CVPR 2025** in **first author** (accept rate: **22.1%**, 2,878 out of 13,008, paper link)

Project: ProGait: A Multi-Purpose Video Dataset and Benchmark for Transfemoral Prosthesis Users

- Developed a multi-purpose dataset supporting vision-based gait analysis for individuals with transfemoral prosthetic legs. The dataset includes 412 video clips from walking trials of four above-knee amputees and supports tasks such as video object segmentation, 2D human pose estimation, and gait classification. Benchmarked fine-tuned models demonstrated improved performance and generalizability over standard pre-trained vision models for prosthesis-specific tasks.
- Accepted to **ICCV 2025** with **highlight** (accept rate: **1%**, 112 out of 11,152, paper link)

Project: MMBERT: Scaled Mixture-of-Experts Multimodal BERT for Robust Chinese Hate Speech Detection under Cloaking Perturbations

- Proposed **MMBERT**, a BERT-based multimodal model using text, audio, and visual inputs with a Mixture-of-Experts architecture. Introduced a corresponding three-stage training strategy to enhance stability and adversarial robustness. Achieved state-of-the-art results on multiple Chinese hate speech datasets.
- Under review in **first author** (paper link)

Research Assistant, Professor Qi Dou's Lab, The Chinese University of Hong Kong, HK Jul 2023-Mar 2024

Project: Deep Learning in Medical image Analysis

- Developed a competition model backbone based on **nnUnet**, **TransUnet** and **SwinUnet** for multi-organ segmentation, and **ViT** for multi-disease detection, achieving 0.94 mean accuracy in segmentation and 0.91 mean accuracy in classification
- Developing a real-time annotation app used for press conference on 3D MRI, embedded with **SAM**, **ResNet**, **Transformer** and **Mult-stage model** for multi-organ segmentation by using the **PyQt5** and **PyTorch**
- Rebuilt the official lab website (Med-AIR Lab@CUHK)

Front End Developer, User Experience Design Division, Hazedawn Ltd., HK May 2022-Jul 2022

- Designed a dynamic and browser compatible page system using **HTML5**, **CSS3** and **JavaScript**
- Built multiple page applications and responsive web design, developed the UI by **HTML5** grid layouts and **CSS3** media queries, added responsive features through JavaScript functions

RESEARCH PROJECTS

Senior (Final Year) Project, Department of Electrical Engineering, PolyU Sep 2022-May 2023

Project: Electrical Energy Forecasting Based on Federated Learning in Edge Computing System

- Proposed and implemented a transfer learning approach of model personalization in federated model training process for energy forecasting in smart meters system as well as a collaboratively worked **CNN-BiLSTM** deep neural network developed by **PyTorch** framework
- Analyzed the effectiveness of the proposed model structure with the personalized federated training approach by comparing various baseline models under different model training approach in terms of training loss and energy forecasting accuracy, around 30% decrease in RMSE compared with baseline models was achieved
- Deployed the whole personalized federated learning system with the **CNN-BiLSTM** model on the Raspberry Pi system for energy forecasting, developed a web application based on **Flask** framework

Undergraduate Research Innovation Scheme, PolyU Jul 2021-May 2023

Project: Hollow-core fiber gas sensor based on Raman photothermal spectroscopy

- Conducted theoretical modeling (**MATLAB**, **COMSOL**) of phase modulation due to stimulated Raman dispersion and evaluated the potential performance of the stimulated Raman dispersion based the hollow-core fiber sensors
- Used a single pump laser with a fixed nominal wavelength and a wavelength-tunable probe laser scanning across the Raman transitions of multiple gases to perform multi-component gas detection

Summer Camp on Robot Learning, PolyU Jun 2022-Sep 2022

Project: Emotion recognition for Huma-Robot-Interaction with visual and audio data

- Developed a server-client system to transmit audio video data flow as an AI model deployment platform for the intelligent HRI experiments using **Python-Flask** framework
- Designed and programmed the robot interaction movement on the Raspberry Pi with Python
- Developed and deployed video model based on **AlexNet** and audio model based on **LSTM** algorithm using **PyTorch**

NUS SOC 2022 Summer Workshop, National University of Singapore Jun 2022-Aug 2022

Project: Forecasting directional movement of stock price based on financial news

- Implemented a hybrid deep learning model combining **Word2Vec** and **LSTM** algorithms using **PyTorch**
- Developed fintech web applications using modern web application frameworks **ReactJS, Python-Flask** and basic DB operations with **SQLite**

Team leader, Green Energy in Future City Competition, HK Electric Sep 2021-Jun 2022

Project: Piezoelectric vibration energy harvester used on railway and bridge

- Led a four people competition team with 6387.05 USD project funding
- Performed simulations on **SSHI** (Synchronized Switch Harvester on Inductor) and **SSPB** (Single-Supply Pre-biasing) power electronic interface used in vibration energy harvesters using **MATLAB & Simulink**
- Constructed power electronic circuit and corresponding microcontroller codes to control the energy harvesting process

HONORS & AWARDS

- Outstanding Student Award (Top 1), Electrical Engineering Department, PolyU 2023
- President Emeritus Professor Poon Chung-kwong Scholarship (Top 2, 6387 USD), PolyU 2022
- Wong Ti-shing Student Exchange Scholarship (Top 4, 6387 USD), PolyU 2022
- Undergraduate Research Innovation Scheme Scholarship (6387 USD), PolyU 2022
- Undergraduate Summer Research Abroad Scheme (Top3, 1277 USD), PolyU 2022
- HKSAR Government Scholarship Fund-Reaching Out Award, HK Education Bureau 2022
- VTech Group of Companies Scholarship (Top 4, 1022 USD), PolyU 2022

- Merit Award of Green Energy in Future City, HK Electric Company 2022
- Professor Leung Tin-pui Memorial Scholarship (Top 2, 6387 USD), PolyU 2021
- Dean's Honors List, College of Engineering, PolyU 2021
- Second Runner-up of Freshman Seminar Project Competition 2021

SKILLS

- Python (PyTorch, Huggingface related libs, NumPy, MONAI, Flask, PyQt5, Pandas, NumPy), C, C++, JavaScript, HTML, CSS, MATLAB, SQL, LaTeX, Docker, GitHub, Vim, Markdown