

## Xu Qianyi

Mobile Phone: (+65) 8374 0219 / Email: qxu011@e.ntu.edu.sg

### EDUCATION

---

- Nanyang Technological University (NTU) Aug 2019 – Jun 2023
- Bachelor of Engineering (Electrical and Electronic Engineering)
  - **NTU Science and Engineering Undergraduate Scholarship Recipient**
  - **Honours (Highest Distinction)** (Expected); current CGPA: 4.81 / 5.00
  - **Dean's List** (2020 – 2021)
  - Specialization: Info-Communications Engineering (Data Intelligence and Processing)

### ACADEMIC PROJECTS / INDUSTRIAL PROJECTS / MODULE PROJECTS

---

- Final Year Project: **Axon-Detect** Sep 2022 – May 2023
- Supervised by Associate Professor Jiang Xudong at Nanyang Technological University and Assistant Professor Pavan Ramdya at Swiss Federal Institute of Technology Lausanne (EPFL).
  - Expect to develop a machine learning algorithm to detect neurons (regions of interest) in population recordings of neuron activity.
  - Expect to make the algorithm able to track the detected neurons across time.

- Summer@EPFL Project: **Active Adaptive Perception** Jun 2022 – Aug 2022
- Supervised by Assistant Professor Amir Zamir in Visual Intelligence and Learning Lab at EPFL.
  - Awarded with Summer@EPFL fellowship that has an acceptance rate of **2%** among applicants including master's students.
  - Developed a pipeline to collect data in an **embodied AI simulation platform (Habitat)**.
  - Built a recurrent model based on **convLSTM** for **multi-frame depth image estimation** using the collected data.
  - Gained knowledge about Reinforcement Learning, Robotic Vision, and Active Perception.

- Personal Project: **Cyto Derm Behavior Enhancement in Single-Cell Segmentation** Feb 2022 – Sep 2022
- Supervised by Assistant Professor Xu Min at Carnegie Mellon University (CMU).
  - Built a novel pipeline for single-cell segmentation with an emphasis on boundary segmentation for **three types of microscopy images: fluorescence, differential interference contrast, and phase contrast**.
  - Proposed a **style transfer** module based on **CycleGAN**, a **customized loss** module, and a **post-processing dense CRF-based** module.
  - Beat **7 SOTA** segmentation algorithms on all **6 metrics** (quantitatively) and improved the continuity and integrity of cell boundary segmentation visually(qualitatively).

- Industrial Project: **Arterial Blood Pressure Estimation** Dec 2021 – May 2022
- Supervised by Dr. Zhao Yonghao at Huawei International Pte Ltd.
  - Researched into **MIMIC-III waveform database** (e.g. Electrocardiogram(ECG), Photoplethysmography Signals(PPG), Arterial Blood Pressure(ABP))
  - Created a convolutional sequential model to predict systolic and diastolic blood pressure based on **ResNet, BiLSTM** and **attention mechanism** with better performance than SOTA algorithms.
  - Built a set of benchmarks including different variations of **GANs(Pix2Pix, CycleGAN)** and **Transformers** for continuous blood pressure prediction that contributed to the development of health monitoring wearable devices.

- Undergraduate Research Experience on Campus (URECA) Project: **POnCIL: Privacy Preserving Online Class-incremental Learning** Aug 2020 – Sep 2022
- Supervised by Associate Professor Chau Lap-Pui at NTU and Dr. Ramasamy Savitha at Agency for Science, Technology and Research (A\*STAR).
  - Developed a task-agnostic online **continual learning** algorithm based on **sparse autoencoders** and broad learning systems (**BLS**).
  - Enhanced privacy preservation by only replaying the embedding vectors instead of raw data.
  - Experimented with both image dataset **MNIST** and **6** kinds of tabular data from **UCI machine learning dataset**.
  - Beat **4 SOTA** algorithms under almost all experiment settings when only half of the samples are replayed.

- Personal Project: ***Uncertainty Quantification of tDCS Using Machine Learning*** Aug 2020 - Apr 2022
- Supervised by Assistant Professor Abdulkadir C. Yucel at NTU
  - Built a surrogate model based on *Random Vector Functional Link Network (RVFLNN)* for uncertainty quantification of transcranial direct current stimulation(tDCS).
  - Achieved accuracy higher than *High-Dimensional Model Representations (HDMR)* with less than 400 training samples.

---

## PUBLICATIONS

---

- **Xu, Q.**, Wong, C., and Ramasamy, S. (2022). POnCIL: Privacy Preserving Online Class-incremental Learning. *ICASSP2023*. Manuscript in preparation.
- Fan, Z., **Xu, Q.**, Tang, Z., Wang, W., Hyatt, T., Zhang, Y., Xing, J., and Xu, M. (2022). Cytoderm Behavior Enhancement in Single-Cell Segmentation. *Bioinformatics*. Manuscript in preparation.

---

## LEADERSHIP/CO-CURRICULAR ACTIVITIES

---

- NTU Lunar New Year Celebration Concert, *Chairperson*** Oct 2021 – Jan 2022
- Led 70 members to hold an online “LIVE” concert that attracted >3000 viewers.
  - Obtained \$2,300 sponsorship from Industrial and Commercial Bank of China.

- NTU MLDA@EEE, *Trainer (Academics & Training)*** Aug 2020 - Jun 2021
- Acquired insights into *Convolutional Neural Networks* for interviewing preparation and enrolment.
  - Assisted to conduct two workshops (i.e. Graphic Processing Unit, and Recurrent Network Network).

- NTU Welfare Service Club, *Member (Friends of Children Portfolio)*** Sep 2019 - Jul 2020
- Tutored primary school students on English and life-coaching skills at Yu Hua Community Centre on weekly basis.
  - Gained rapport with children through engagement.

- NTU Bridging Music Club, *President*** Sep 2018 - Jun 2019
- Assumed role as *Musical Club Representative*; successfully achieved \$600 sponsorship from faith-based community.
  - Assumed role as *Music Director* when organizing music club concert for the faith-based community; it included directing and supporting backstage and logistics.

---

## SKILLS

---

- **Languages:** Fluent in English and Chinese (Mandarin)
- **Programming:** Python, MATLAB, HTML, CSS, JavaScript
- **Deep Learning Frameworks:** PyTorch, TensorFlow
- **Others:** Git, LaTeX
- **Software Applications:** Microsoft Office 2022 (Word, PowerPoint, Excel)