Weizhe Lin

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Education

Trinity College, University of Cambridge **10/2017 – 06/2021**
BA & M.Eng Information Engineering - Full Oversea Scholarship & Camrbidge Trust Scholarship

The University of Hong Kong **08/2016 – 06/2017**
B. Eng GPA 3.91/4.3 - HKU Entrance Scholarship

Xiamen No.1 High School of Fujian, China **09/2013 – 06/2016**
Ranked 68 out of 200,000 in Joint College Entrance Examination, Fujian Province, China

Work Experience

Researcher at Computer Laboratory, University of Cambridge **06/2020 – 09/2020**

- Improved multi-agent path planning with graph attention networks
- Supervisor: Amanda Prorok

Researcher at Computer Laboratory, University of Cambridge **06/2019 – 09/2019**

- Proposed a network-based novel multi-modal feature fusion framework to aid in prediction of psychological disorder.
- Developed a self-adaptor(fidgeting) detection system for automated detection of psychological distress
- Supervisor: Marwa Mahmoud

Software Development Contractor for Bingo Century Investment Management Limited **04/2019 - Now**

- Independently developed a real-time news crawling and monitoring system with front-end presentation and server-end analysis
- Currently developing an event-driven stock prediction system using Natural Language Processing techniques.

Cloud Engineering Intern in Informetis Europe Ltd. **08/2018 – 09/2018**

- Developed a Python Django-based website which tracks usage data by IoT devices in Power Supply monitors (which the company manufactures). This information then helps machine learning engineers to develop more accurate algorithm to predict how energy is used by various electrical appliances
- Gained skills in database management, involving the use of MySQL, Google Bigtable and Redis Caching.

Projects

Knowledge-aware multi-domain task-oriented dialogue systems (final year dissertation) **2020 - Current**

- Final year project supervised by Prof. Bill Byrne (Head of Information Engineering).
- Utilising neural forms of graph networks in dialogue systems

Multi-robot path planning **2020 - Current**

- Supervised by Amanda Prorok.
- Imitation learning using Graph Neural Network to communicate between agents.
- Utilize graph attention neural network to leverage the performance of moving agents to their goals.

COVID-19 diagnosis assist and CT denoising (AIXCOVNET Project Support Member) **2020 - Current**

- Working with Stranks Lab of Cavendish Laboratory, NHS(Addenbrooke's Hospital), Department of Radiology. Supervised by Sam Stranks.
- Perform CT denoising on datasets of COVID-19 and other commonly-seen lung diseases.
- Low-dose high-speed CT screening

Image reconstruction for hyperspectral microscopy using deep learning **2019 - Current**

- Working together with Stranks Lab of Cavendish Laboratory. Collaborate with VISION Laboratory of Department of Physics. Supervised by Sam Stranks.
- Using machine-learning-based methods to denoise and reconstruct physics-informed images obtain by special microscopy.
- Highly reduced the required laser exposure time for taking images for physics/material research.

Automatic fidgeting and self-adaptor detection for psychological distress from 2D videos **2019 - 2020**

- Developed a fully automated system to detect the fidgeting behaviour (such as touching face by hand and rhythmic body motion). Supervised by Marwa Mahmoud.
- Using Gaussian Mixture Model and Fisher Vector for feature fusion and dimension reduction.
- Perform classification based on multi-modal features extracted from interview videos.

LearnAh.uk - teach science the fun way using popular science videos **2018 - 2019**

- Recommends popular videos using techniques of machine-learning based text analysis (Latent Semantic Indexing & Latent Dirichlet Allocation) based on teaching plans - **Link**
- UCL Institute of Education Knowledge Lab EDUCATE Graduate (with EU grant) + Y Combinator Startup School Graduate + Runner-up, Cambridge University Entrepreneur £2,000 competition (Social Enterprise)

Achievements

Personal Awards

- Runner-up in Integrated Design Project (Robot design challenge in Dept. of Engineering) (2019)
- Airbus Defense and Space Prize 2018 for Mars Lander Design and Programming Contest (Runner Up) (2018)
- 1st Year Structural Design Course Prize (Dept. of Engineering) (2017)
- Full Oversea Scholarship from Trinity College & Cambridge Trust Scholarship (2017)
- Centenary Prize for Top 3 Information, Electrical and Electronics Engineering Final Project of Hong Kong University (2017)
- Third place in Computer Science Projects of 15th China Future Scientist Award Program (2015)
- Silver Medal in Chinese Physics Olympiad (Fujian Division) (2015)

Publications and Presentations (Link to Google Scholar Page)

- **Weizhe Lin**, Indigo Orton, Mingyu Liu, Marwa Mahmoud. Automatic Detection of Self-Adaptors for Psychological Distress. 2020. In *Proceedings of 2020 15th IEEE International Conference on Automatic Face & Gesture Recognition (FG 2020)*. **<Oral session> Read**
- Ziheng Zhang*, **Weizhe Lin* (*equal contribution)**, Mingyu Liu, Marwa Mahmoud. Multimodal Deep Learning Framework for Mental Disorder Recognition. 2020. In *Proceedings of 2020 15th IEEE International Conference on Automatic Face & Gesture Recognition (FG 2020)*. **<Oral session> Read**
- Zhilin Wang, Elena Rastorgueva, **Weizhe Lin** and Xiaodong Wu. No you're not alone A better way to find people with similar experiences on Reddit. 2019. In *Proceedings of the 2019 EMNLP Workshop W-NUT: The 5th Workshop on Noisy User-generated Text*. **Read**
- Zhilin Wang, Xiaodong Wu, **Weizhe Lin** and Elena Rastorgueva. Detecting personal attributes through analyzing online forums. 2019. In *Cambridge Language Sciences Early Careers Researchers Symposium*. **Read**

Papers Under Review and in Preparation

- Qingbiao Li*, **Weizhe Lin* (*equal contribution)**, Zhe Liu and Amanda Prorok. Message-Aware Graph Attention Networks for Large Scale Multi-Robot Path Planning. 2020. Submitted to *IEEE Robotics and Automation Letters*. **Read**
- Zhilin Wang, **Weizhe Lin** and Xiaodong Wu. Identifying Similar Movie Characters Quickly but Effectively Using Non-exhaustive Pair-wise Attention. 2020. *Under conference review.* **Read**
- **Weizhe Lin**, Indigo Orton, Qingbiao Li, Gabriela Pavarini, Marwa Mahmoud. Investigation of Self-Adaptors for Psychological Distress. 2020. Submitted to *IEEE Transactions on Affective Computing*. **<Invited to submit> Read**
- Kangyu Ji*, **Weizhe Lin* (*equal contribution)**, Qingbiao Li and Sam Stranks. Physics-aware Hyperspectral Image Restoration. 2020. *Finished Paper. Available upon request*
- Zhilin Wang, **Weizhe Lin**, Xiaodong Wu and Elena Rastorgueva. An investigation into BERT applied to informal language used on Internet forums. 2020. *Under conference review. Available upon request*
- **Weizhe Lin**, Xiaodong Wu, Zhilin Wang and Elena Rastorgueva. Author2Vec: A Novel Framework for Generating User Embedding. 2019. *on Arxiv.* **Read**

Websites I built

- Website of Hercules Cambridge society:
  https://www.herculescambridge.org.uk
- Website of NLP project LearnAh
  https://learnah.uk

Technical Skills

- Machine Learning: Affective Computing, Computer Vision and Natural Language Processing
- Software Engineering: Programming (C++/Python/Java/Visual Basic), Cloud Engineering(Django/SQL/JavaScript)

Application-related Course List

We study machine-learning related modules only in the final two years.

2019-2020

- Inference (Bayesian inference, clustering, dimension reduction, etc.)
- Signals and systems (Nyquist diagram, control theory, etc.)
- Statistical signal processing (filter, auto-correlation, moving average, etc.)
- Data transmission (network data transmission, encoding and decoding, etc.)
- Information theory and coding
- Mathematical methods (Markov chains, optimization, linear algebra)
- Partial differential equations and variational methods

2020-2021

- Statistical machine learning (Gaussian process, message passing, LDA, etc.)
- Computer vision (projection, stereo vision, deep learning)
- Deep learning and structured data (graphical models, deep learning, sequence models, etc.)
- *next year* Image processing and coding
- *next year* Computer systems
- *next year* Software engineering
- *next year* Robot mobile systems (reinforcement learning)