Muqiao Yang

412-708-5576 | muqiaoy@cs.cmu.edu | github.com/muqiaoy | Google Scholar

Education

Carnegie Mellon University — Pittsburgh, PA, USA
Ph.D. in Electrical and Computer Engineering — *Expected: May 2025*

Carnegie Mellon University — Pittsburgh, PA, USA
M.S. in Electrical and Computer Engineering — *Dec. 2019*

The Hong Kong Polytechnic University — Hong Kong
B.E. in Electronic and Information Engineering, Minor in Computer Science — *May 2018*

Publications

- **Muqiao Yang***, Joseph Konan*, David Bick*, Anurag Kumar, Shinji Watanabe, Bhiksha Raj. Improving Speech Enhancement through Fine-Grained Speech Characteristics. *Conference of the International Speech Communication Association (Interspeech)*, 2022.
- **Muqiao Yang**, Ian Lane, Shinji Watanabe. Online Continual Learning of End-to-end Speech Recognition Models. *Conference of the International Speech Communication Association (Interspeech)*, 2022.
- Xingbo Wang, Jianben He, Zhihua Jin, **Muqiao Yang**, Yong Wang, Huamin Qu. M^{2}Lens: Visualizing and Explaining Multimodal Models for Sentiment Analysis. *IEEE Visualization Conference (VIS)*, 2021. (*Honorable Mention Award)
- Ryan Mohr, Allan Avila, Soham Gosh, Ananta Bhattarai, **Muqiao Yang**, Xintian Feng, Martin Head-Gordon, Ruslan Salakhutdinov, Maria Fonoberova, Igor Mezic. Combining Programmable Potentials and Neural Networks for Materials Problems. AAAI Spring Symposium: MLPS 2021.
- Yao-Hung Hubert Tsai, Martin Q. Ma, **Muqiao Yang**, Han Zhao, Louis-Philippe Morency, Ruslan Salakhutdinov. Self-supervised Representation Learning with Relative Predictive Coding. *International Conference on Learning Representations (ICLR)*, 2021.
- Yao-Hung Hubert Tsai*, Martin Q. Ma*, **Muqiao Yang***, Ruslan Salakhutdinov, Louis-Philippe Morency. Multimodal Routing: Improving Local and Global Interpretability of Multimodal Language Analysis. *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
- **Muqiao Yang***, Martin Q. Ma*, Dongyu Li*, Yao-Hung Hubert Tsai, Ruslan Salakhutdinov. Complex Transformer: A Framework for Modeling Complex-valued Sequence. *International Conference on Acoutics, Speech and Signal Processing (ICASSP)*, 2020.
- Mengsu Ding, **Muqiao Yang**, Shimin Chen. Storing and Querying Large-Scale Spatio-Temporal Graphs with High-Throughput Edge Insertions. *arxiv preprint arXiv:1904.09610*, 2019

Experience

Research Intern — May. 2022 – Aug. 2022
Microsoft, Redmond, WA *Mentor: Xiaofei Wang, Naoyuki Kanda*
- Working on improving multi-talker Automatic Speech Recognition by simulating realistic conversations.

Graduate Research Assistant — Jan. 2022 – present
Carnegie Mellon University *Advisor: Bhiksha Raj, Shinji Watanabe*
- Worked on speech enhancement with an optimization on fine-grained speech characteristic features.
- Improved both objective and subjective evaluation metrics by finetuning existing well-trained speech enhancement models with optimization on the extended Geneva Minimal Parameter Set (eGeMAPS) as the feature set.

Graduate Research Assistant — Sept. 2020 – present
Carnegie Mellon University *Advisor: Ian Lane, Shinji Watanabe*
- Developed end-to-end spoken language understanding to perform intent classification and dialog state tracking.
- Applied pretrained ASR encoder and natural language understanding teacher for cross-modal learning.
- Working on lifelong learning in Automatic Speech Recognition.

Research Associate — Feb. 2020 – Sept. 2020
Carnegie Mellon University *Advisor: Ruslan Salakhutdinov*
- Replaced Kullback-Leibler divergence with Pearson Chi-square divergence and applied relative ratio estimation to solve robustness problem in mutual information-based representation learning models.

Graduate Research Assistant — Sept. 2018 – Feb. 2020
Carnegie Mellon University *Advisor: Ruslan Salakhutdinov, Louis-Philippe Morency*
- Developed Retrieval-based approach to generate realistic audios from text with ConceptNet and optimize the audio transformation model with an adversarial loss.
- Developed multimodal Capsule network for emotion recognition tasks and increased interpretability to identify contributions of each modality by routing coefficients.

- Proposed complex transformer and conducted sequence prediction and generation tasks on both datasets and achieved state-of-the-art result on MusicNet automatic transcription.

Research Intern May. 2018 – Aug. 2018
Chinese Academy of Sciences *Advisor: Shimin Chen*

- Developed PAST, a framework for efficient PArtitioning and query processing of Spatial-Temporal graphs with Apache Cassandra and Apache Spark.

Undergraduate Research Assistant Apr. 2017 – May. 2018
The Hong Kong Polytechnic University *Advisor: Man-Wai Mak*

- Developed a recommendation system on large-scale Yahoo! datasets with Apace Hadoop and Apache Spark.

Teaching

- 18-661, Introduction to Machine Learning for Engineers, Carnegie Mellon University, Fall 2022.
- 18-660, Optimization, Carnegie Mellon University, Spring 2022.
- 10-605, Machine Learning with Large Datasets, Carnegie Mellon University, Fall 2021.

Skills

Programming Languages: Python, HTML/CSS
Languages: English, Mandarin, Cantonese