Chia-Hsuan (Michael) Lee

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Research interests:
My research interests are deep learning/machine learning and their applications in natural language processing. My recent research interests are open-domain question answering, dialogue systems and semantic parsing. Broadly speaking, I am interested in language understanding and interpretability of deep learning models.

Education

- **University of Washington** — **Seattle, U.S.**
  PhD in Electrical and Computer Engineering, *Sep, 2019 –*
  Natural Language Processing Group, Advisor: Professor Mari Ostendorf - **with Fellowship Fundings**
- **National Taiwan University** — **Taipei, Taiwan**
  Master, Computer Science, *Sep, 2017 – June, 2019*
  Advisors: Profs. Lin-shan Lee and Hung-Yi Lee
- **National Taiwan University** — **Taipei, Taiwan**
  B.S., Electrical Engineering, *Sep, 2012 – Jan, 2017*
  Advisor: Prof. Hung-yi Lee

Research Internship

- **AI Research intern, Machine Translation Team, Google**, Mountain View, CA, June-Sep 2021 (expected)
  Pretraining for Multilingual Multi-task Benchmark.
- **AI Research intern, NLP group, Microsoft**, Redmond, WA, June-Sep 2020
  Cross domain text-to-SQL parsing.
- **NLP intern, Siri Team, Apple Inc.**, Cupertino, CA, July-Sep 2019
  Multilingual language modeling

Publications (All as the First Author)

[1] **"KaggleDBQA: Realistic Evaluation of Text-to-SQL Parsers" ACL2021**

[2] **"Cross-Lingual Transfer Learning for Question Answering"** [Link]
• Incorporate adversarial learning to learn domain-invariant feature representations between languages.
• Successfully bootstrap knowledge from English and achieve SOTA over a Chinese QA corpus, which outperforms previous best model by over 30 % F1 score.

[3] "Spoken SQuAD: A Study of Mitigating the Impact of Speech Recognition Errors on Listening Comprehension" **Interspeech 2018** [Link]
• Successfully construct a challenging spoken question answering(QA) dataset.
• Utilize phonetic sub-word units to mitigate ASR errors and consistently improve SOTA QA model by 1.4% F1 score under different levels of noises.

[4] "ODSQA: Open-Domain Spoken Question Answering Dataset" **IEEE SLT 2018** [Link]
• Collect the largest open domain spoken QA dataset.
• Propose two data augmentation approaches: Text-to-Speech and Back-to-Back translation and improve SOTA QA model by 4% F1 score.

[5] "Mitigating the Impact of Speech Recognition Errors on Spoken Question Answering by Adversarial Domain Adaptation" **ICASSP 2019** [Link]

- Incorporate adversarial learning to adapt Reference Transcriptions domain to ASR hypotheses domain.
- Outperform previous best model by 2% EM score.

[6] "Towards Machine Comprehension of Spoken Content", **IEEE Transactions on Audio, Speech and Language Processing**[Link]
- Thorough study of QA models over two spoken QA corpora.
- Select important sentences by using gated GRU and conduct multi-hop reasoning by long term memory component.

Honors and Awards

- **Electrical and Computer Engineering PhD Fellowship, University of Washington, Seattle**
- Language Technologies Research Scholarship, Committee of Advanced Language Technologies (US$16,000)
- Artificial Intelligence Top Research Scholarship, Appier
- Student Research Scholarship, Ministry of Science and Technology of Taiwan

Research and Teaching Experiences

Graduate Researcher, Speech Processing and Machine Learning Lab **Taiwan**
Advisors: Profs. Lin-Shan Lee and Hung-Yi Lee, *Sep, 2017 – June, 2019*
- Utilize learned phonetic representations to improve speech question answering model. **[Interspeech]**
- Utilize Back-to-Back translation system and Text-to-Speech system to improve speech question answering. **[IEEE SLT]**
- Propose an unified framework for cross-domain question answering and successfully achieved significant improvement on challenging cross lingual task and speech question answering task. **[ICASSP]**

Teaching Assistant **Taiwan**
National Taiwan University, Advanced Deep Learning [CSIE7430], *Mar, 2018 – June, 2018*
Design a challenging video caption generation task using CNN + RNN Seq-to-Seq.

Head Teaching Assistant **Taiwan**
National Taiwan University, Machine Learning [EE5184], *Sep, 2017 – Jan, 2018*
Organize 19 teaching assistants and create 9 assignments for 353 students including text Sentiment classification(RNN+DNN, Semi-Supervised learning), movie recommendation(Matrix Factorization, DNN), chatbot(Seq-to-Seq) and speech translation(Kaldi, Retrieval Model, Seq-to-Seq). [Course Link]

Research Assistant, Speech Processing and Machine Learning Lab **Taiwan**
Advisor: Prof. Hung-Yi Lee, *Jan, 2017 – Aug, 2017*
Utilize learned gating function and long-term memory to improve two speech question answering corpora. **[IEEE Transactions on Audio, Speech and Language Processing]**

Selected Projects

CSIE5130 Multimedia Analysis and Indexing **Taiwan**
Sketch-based Image Retrieval across Art Styles, *2017 Sep – 2018 Jan*
Perform cross-domain image retrieval across different art styles using sketches as queries via hierarchical triplet CNN and triplet margin loss.

EE5047 Artificial Intelligence **Taiwan**
Vision-based Deep Reinforcement Learning : Playing Atari Games , *2016 Sep – 2017 Jan*
Analyze the strength and weakness of Deep Q Learning(DQN), DoubleDQN and DuelingDQN in Atari Games