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, conversational AI and language modeling. 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

- **Natural Language Processing Team, Apple Inc.**, Cupertino, CA, July-Sep 2019

Publications (All as the First Author)

[1] "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.

[2] "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.

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

[4] "Mitigating the Impact of Speech Recognition Errors on Spoken Question Answering by Adversarial Domain Adaptation" **ICASSP 2019** [Link]
- Incorporate Generative Adversarial Network to adapt Reference Transcriptions domain to ASR hypotheses domain.
- Outperform previous best model by 2% EM score.

[5] "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**
- Speech Technologies Research Scholarship, Committee of Advanced Speech 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 Lab** **Taiwan**
  Advisors: Profs. Lin-Shan Lee and Hung-Yi Lee, *Sep, 2017 – Now*
  - 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

Relevant Coursework * denotes graduate-level course

- **Machine Learning / Artificial Intelligence**
  Artificial Intelligence, Machine Learning*, Applied Deep Learning*, Web Retrieval and Mining**, Data Science*, Digital Speech Processing*, Multimedia Analysis and Indexing*, Computer Vision*,

- **Fundamental Programming Courses**
  Data Structure and Programming, Algorithms, the Design and Analysis of Algorithms, Computer* Programming, Embedded System, Computer Networks,

Skills

- Programming Languages: Python, C/C++, Matlab, R
- Toolbox/Software: Tensorflow, Git, LaTeX