# Jui-Yang **Hsu**

Graduate Researcher at NTU EECS

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## Research Interest

I am interested in machine learning for speech and natural language. In particular meta learning and transfer learning.

## Education

**National Taiwan University (NTU)** — *Taipei, Taiwan*

M.S. in Computer Science & Electrical Engineering — *Oct. 2018 - Feb. 2021*

- Speech Processing & Machine Learning Laboratory, Advisor: Prof. Hung-Yi Lee
- Thesis: Meta Learning in End-to-End Speech Recognition

**Kungliga Tekniska högskolan (KTH)** — *Stockholm, Sweden*

Exchange student in Computer Science & Communication — *Aug. 2017 - June 2018*

**National Taiwan University (NTU)** — *Taipei, Taiwan*

Bachelor of Science in Engineering — *Sep. 2013 - June 2018*

- Department of Electrical Engineering, GPA: 4.02/4.3

## Work Experience

**Visual Document Intelligence Team, AI & RD Center, Microsoft** — *Taipei, Taiwan*

Research Intern — *Oct. 2020 - Mar. 2021*

- Implemented unified multi-vertical document understanding model
- Migrated and refactored model training to Pytorch Lightning for much faster development and maintenance
- Migrated model training to the official AzureML training pipeline

**Speech Processing & Machine Learning Laboratory, NTU** — *Taipei, Taiwan*

Graduate Researcher, supervised by Prof. Hung-Yi Lee — *Oct. 2018 - Sep. 2020*

- Researched on low-resource speech recognition, focusing on improving the system with gradient-based meta learning and transfer learning [thesis] [slides] [1]
- As the **network administrator**, manage the slurm-based computation cluster (10 nodes, over 20 GPUs)
- Migrated netdata to replace the original unstable monitor system to support real-time resource monitoring for users
- Developed health check and notification mechanism to drain problematic nodes and notify to the public platform automatically

**Natural Language Processing Team, Apple Inc.** — *Cupertino, USA*

Research Intern, supervised by Dr. Jerome Bellegarda — *July 2018 - Sep. 2018*

- Researched on deep generative model to develop algorithm improving keyboard experience of users [3]
- The research results have been published in iOS 13

**Speech Processing & Machine Learning Laboratory, NTU** — *Taipei, Taiwan*

UnderGraduate Researcher, supervised by Prof. Hung-Yi Lee & Prof. Lin-Shan Lee — *July 2015 - June 2017*

- Proposed the hierarchical attention-based model for the TOEFL Listening Comprehension Test by machine [2] [5]
- Researched on unsupervised audio word embeddings

**Speech & Sound Team, Delta Research Center (DRC)** — *Taipei, Taiwan*

Research Intern — *July 2016 - Aug. 2016*

- Researched on end-to-end speech recognition based on CTC
- Reduced 3% CER on the corpus held by DRC, nearly comparable to the original system
- Migrated acoustic modeling to Tensorflow for faster development (building the interface between Kaldi & Tensorflow)

**National Taiwan University** — *Taipei, Taiwan*

Teaching Assistant

- CommE5054 Deep Learning for Human Language Processing (Spring 2020)
- EE5184 Machine Learning (Spring 2017) [designed assignments]

## Publicatons

[1] **Jui-Yang Hsu**, Yuan-Jui Chen, Hung-Yi Lee. "Meta Learning for End-to-End Low-Resource Speech Recognition". *In International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2020. [link] [video]

[2] Wei Fang†, **Jui-Yang Hsu**†, Hung-Yi Lee, Lin-Shan Lee. "Hierarchical Attention Model for Improved Comprehension of Spoken Content". *In IEEE Workshop on Spoken Language Technology (SLT)*, 2016. [link]

[3] Jerome R. Bellegarda, **Jui-Yang Hsu**, Partha Lal, Akash Mehra. "User-realistic path synthesis via multi-task generative adversarial networks for continuous path keyboard input" US Patent, US20200379640A1. [link]

[4] Yi-Chen Chen, **Jui-Yang Hsu**, Cheng-Kuang Lee, Hung-yi Lee "DARTS-ASR: Differentiable Architecture Search for Multilingual Speech Recognition and Adaptation". *In Conference of the International Speech Communication Association (INTERSPEECH)*, 2020. [link]

[5] Chia-Hsuan Lee, Hung-Yi Lee, Szu-Lin Wu, Chi-Liang Liu, Wei Fang, **Jui-Yang Hsu**, Bo-Hsiang Tseng. "Machine Comprehension of Spoken Content: TOEFL Listening Test and Spoken SQuAD". *In IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)*, 2019. [link]

## Honors & Awards

**Chiao Hsin Cheng Scholarship**, NTU EECS *July, 2017*
**Conference Grant**, Ministry of Science and Technology *Dec., 2016*
**Best Team Award** (out of 30+ teams), Garage Hackathon held by Microsoft Research Asia (MSRA) *Aug., 2015*

## Skills

**Programming** Python, C++
**Libraries/Tools** PyTorch, Git, Slurm
**OS** GNU/Linux
**Sports** Table Tennis (Varsity in NTU, 2013), Mountain Climbing (16/100 mountains), Marathon