

# Jui-Yang Hsu

RESEARCH ENGINEER · APPLIED SCIENTIST · MACHINE LEARNING ENGINEER

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## Work Experience

### Computing & Artificial Intelligence Group, MediaTek

Hsinchu, Taiwan

SOFTWARE ENGINEER

Jan. 2022 - Present

- Architect and contributor of the in-house compiler auto-optimization toolkit (evolutionary algorithm, RL)
- Proposed, implemented, and maintained Prefect-based distributed computing platform for heterogeneous devices (host, various generations of smartphone platforms)
- Proposed novel algorithms for auto-optimization, boosted the inference speed in 20 [ETHZ AI-benchmark](#) (out of 38)
- Inventor of 4 patents in compiler auto-optimization, efficient and scenario-aware network architecture search (NAS)
- Improved customers' AI-model time/power efficiency via in-house compiler auto-optimization and NAS toolkit

### Visual Document Intelligence Team, AI & RD Center, Microsoft

Taipei, Taiwan

RESEARCH INTERN

Oct. 2020 - Mar. 2021

- Proposed and refactored model training to Pytorch Lightning for faster development and easier maintenance
- Migrated model training to the official AzureML training pipeline
- Implemented unified multi-vertical document understanding model (multi-task learning, data-augmentation)

### 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  
Focused on improving the system with gradient-based meta-learning and transfer learning [\[thesis\]](#) [\[slides\]](#) [\[1\]](#)
- As the **network administrator**, managed a 10+ nodes, 20+ GPU Slurm-based computing cluster  
Incorporated netdata to the workstation for real-time monitoring  
Developed automatic health check to improve user/administrator experience

### Natural Language Processing Team, Apple Inc.

Cupertino, USA

RESEARCH INTERN, SUPERVISED BY DR. JEROME BELLEGARDA

July 2018 - Sep. 2018

- Researched on generative modeling to develop algorithms enhancing user experience during keyboard usage
- The research results have been incorporated in iOS 13 and published as US patent [\[2\]](#)

### 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 hierarchical attention-based model for TOEFL Listening Comprehension Test by machine [\[3\]](#) [\[5\]](#)
- Researched on self-supervised audio word embeddings

### Speech & Sound Team, Delta Research Center (DRC)

Taipei, Taiwan

RESEARCH INTERN

July 2016 - Aug. 2016

- Proposed and built the interface between Kaldi & Tensorflow, migrating acoustic modeling to Tensorflow for faster development
- Researched on end-to-end speech recognition based on alignment-free algorithm (CTC)
- Reduced 3% character error rate (CER) on the corpus held by DRC, nearly comparable to the original system

## 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

B.S. IN ELECTRICAL ENGINEERING

Sep. 2013 - June 2018

- Department of Electrical Engineering, GPA: 4.02/4.3

## Publications

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- [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] 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*. [\[link\]](#)
- [3] Wei Fang<sup>†</sup>, **Jui-Yang Hsu**<sup>†</sup>, Hung-Yi Lee, Lin-Shan Lee. “Hierarchical Attention Model for Improved Comprehension of Spoken Content”. In *IEEE Workshop on Spoken Language Technology (SLT)*, 2016. [\[link\]](#)
- [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

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**Chiao Hsin Cheng Scholarship**, NTU EECS

July, 2017

**Conference Grant**, Ministry of Science and Technology

Dec., 2016

## Services

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**Lead TA**, NTU CommE5054 Deep Learning for Human Language Processing

Spring 2020

**Reviewer**, Annual Meeting of the Association for Computational Linguistics (ACL)

2020

**TA**, NTU EE5184 Machine Learning

Spring 2017