

Heng-Jui (Harry) Chang

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My research interest is in **machine learning** and **spoken language processing**. In particular, I focus on end-to-end automatic speech recognition (ASR) and self-supervised speech representation learning.

Education

National Taiwan University (NTU)

Taipei, Taiwan

B.S. in **Electrical Engineering** and **Intelligence Medicine Program**

Sep. 2017 – Jun. 2021 (expected)

- **GPA:** overall: **4.24/4.30**, last 60 credits: **4.27/4.30**, ranking: **6/261 (top 2%)**
- **Honors:** 4 Dean's List Awards and Irving T. Ho Memorial Scholarship
- **Related courses:** Digital Speech Processing, Deep Learning for Human Language Processing, Algorithms, Data Structures & Programming, Machine Learning, Optimization Algorithms

Research Experience

Speech Processing Laboratory, NTU

Taipei, Taiwan

Undergraduate Researcher, Supervised by Prof. Lin-shan Lee & Prof. Hung-yi Lee

Mar. 2019 – Present

- **Compact Speech Representation Learning**
Developing novel methods to learn compact speech representation.
- **Lifelong Learning of End-to-end ASR**
Extensively considered and analyzed various approaches of lifelong learning in end-to-end ASR.
- **End-to-end Whispered Speech Recognition** [1] [[paper](#)]
Proposed frequency-weighted approaches, layer-wise transfer learning, and pseudo whisper pre-training methods for robust whispered speech recognition with end-to-end models.

Publications

- [1] **Heng-Jui Chang**, Alexander H. Liu, Hung-yi Lee, and Lin-shan Lee, "End-to-end whispered speech recognition with frequency-weighted approaches and pseudo whisper pre-training", *accepted to IEEE Spoken Language Technology Workshop (SLT)*, 2021.

Selected Projects

End-to-end Automatic Speech Recognition in PyTorch [[Github Link \(750+ stars\)](#)]

Open Sourced Project, Github

Aug. 2020

- Implemented the CTC beam decoding algorithm in PyTorch and helped maintaining the project.

Are We Attracted to People Who Look Like Us? [[Github Link](#)]

Course final project of *Interactive Computer Graphics*, NTU CSIE

Jun. 2020

- A psychological experiment using 2D face image metamorphosis implemented in NumPy and OpenCV.
- Let people rank morphed faces by attractiveness where one of the faces included their faces and the results corroborated the hypothesis with high confidence.

Deep Learning-Based Image Geometric Rectification [[Demo Link](#)]

Course final project of *Digital Image Processing*, NTU EE

Jan. 2020

- Used a CNN-based autoencoder to estimate the displacement vector field and restore distorted images by self-supervised learning with synthesized images.

Teaching

- **Teaching Assistant** at NTU EE Fall 2020
Linear Algebra – Instructor: Prof. Hung-yi Lee
- **Teaching Assistant** at NTU EE Summer & Fall 2020
Deep Learning for Human Language Processing Special Project – Instructor: Prof. Hung-yi Lee
- **Teaching Assistant** at NTU EE Spring 2020
Signals and Systems – Instructor: Prof. Lin-shan Lee

Scholarships and Awards

- **Irving T. Ho Memorial Scholarship**, NTU EECS 2020
- **Dean's List Award**, NTU EE (Fall'17, Spring'19, Fall'19, Spring'20) 2017–2020
- **7th Place**, Final Project of Data Structure and Programming, NTU EE (125 attendees) 2019
- **Enterprise Award**, MakeNTU Hackathon 2018
- **6th Place**, Taipei High School Academic Competition in Informatics (115 attendees) 2016

Skills

- **Programming:** C/C++, Python, MATLAB, Bash
- **Deep Learning:** Pytorch, Keras, Tensorflow
- **Speech Processing:** Kaldi ASR Toolkit
- **OS:** Linux, Mac OSX
- **Other:** Git, L^AT_EX

Languages

- **English:** proficient
- **Mandarin:** native
- **Japanese:** intermediate

Extracurricular Activities

The Republic of China Army

Rifleman

Taichung, Taiwan

Summer 2018 & Summer 2019

- Completed obligatory military service through two-staged regular service for university and college students.

NTU Balloon Design Club

Lecturer

Taipei, Taiwan

Jun. 2018 – Jun. 2019

- Designed balloon arts, taught members techniques, and held several events. [[page](#)] [[photo](#)]

LINE Store

LINE Sticker Creator

Taipei, Taiwan

Jun. 2016 – Feb. 2019

- Created three sets of LINE stickers and sold online. [[HJ Chang's Stickers](#)]
- Sold stickers are globally used 500+ times per day.

Services

- **Conference Reviewer Assistant:** ICASSP'21