

# Yung-Hsu Yang

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## EDUCATION

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### National Tsing Hua University

*MS of Electrical Engineering*

Sep. 2020 – Present

*advised by Prof. Min Sun*

### National Tsing Hua University

*BS of Electrical Engineering*

Sep. 2016 – June 2020

## RESEARCH EXPERIENCE

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### 3D Detection and Tracking with Deep Learning

July 2020 – Present

*Master degree research, advised by Prof. Min Sun and Prof. Fisher Yu*

- Designed different data preparation methods to train and test our model on multiple datasets.
- Added new multi-head model branch on our monocular end-to-end 3D Detection and Tracking approach.
- Won the first place in nuScenes 3D Tracking Benchmark with only camera modality.

### Deep Knowledge Tracing

July 2019 – Present

*Tera Thinker Technology Inc.*

- Implemented and lightened the DeepIRT model with PyTorch.
- Modified the model to work with powerful NLP embedding network to handle the real-world data.

### Multi-speaker Automatic Speech Recognition (ASR) with Deep Learning

Sep. 2019 – June 2020

*Academia Sinica, advised by Dr. Yu Tsao and Hung-Shin Lee*

*Taipei, Taiwan*

- Implemented the deep clustering approach speech separation model with PyTorch.
- Analyzed the ASR results of the separated speech.

### End-to-End Automatic Speech Recognition (ASR) with Deep Learning

Aug. 2019

*Academia Sinica, advised by Dr. Yu Tsao and Hung-Shin Lee*

*Taipei, Taiwan*

- Implemented end-to-end GMM-free ASR model with Kaldi.
- Modified and trained the e2e ASR model into Chinese version.

### Speech Enhancement with Deep Learning

July 2019

*Academia Sinica, advised by Dr. Yu Tsao*

*Taipei, Taiwan*

- Implemented different speech enhancement models with Keras.
- Analyzed the results of Bi-LSTM, Conv-DeConv and VAE backbones.

### 3D Human Pose Estimation Deep Learning Model Optimization

July 2019 – Aug. 2019

*Undergraduate Research*

- Implemented 3D Human Pose Estimation model with PyTorch.
- Quantized the well-trained model and maintain the model performance with faster inference time and smaller size.

### Natural Language Processing with Deep Learning

Sep. 2018 – June 2019

*Undergraduate Research*

- Studied the newest papers in NLP domain.
- Got familiar with NLTK toolkit and implemented toy models.

## WORK EXPERIENCE

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### Back-end and Model Developer of AI Startup

July 2019 – Present

*Tera Thinker Technology Inc.*

- Designed SQL database schema and built it on Google Cloud SQL.
- Built Restful API under Django framework on Google Application Engine.
- Built Deep Knowledge Tracing Model services under Flask framework on Google Application Engine.

### Teaching Assistant

Nov. 2020

*NTHUEE Digital Signal Processing Laboratory*

*Hsinchu, Taiwan*

- Designed courses for image edge detection and seam carving algorithm.

### Quality Assurance Intern

Sep. 2019 – Dec. 2019

*Umbo Computer Vision Inc.*

*Taipei, Taiwan*

- Designed Test Plan and wrote python scripts for automatic testing.
- Participated in Scrum meeting and DevOps process.

## RELEVANT COURSES

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### Core Courses:

- Introduction to Machine Learning, Introduction to Intelligent Computing, System Theory (RL)
- Statistical Learning, Deep Learning, Deep Learning and NLP Research Methodologies
- Digital Signal Processing Laboratory, Natural Language Processing Laboratory

### Other Courses:

- Introduction to Programming, Data Structures, Computer Architecture, Operating System
- Introduction to Computer Networks, Cloud Computing
- Logic Design Laboratory, Interaction Design (HCI)

## SELECTED PROJECTS

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- AI CUP 2020 Mango Image Recognition Challenge** | *Python, PyTorch, Keras* June 2020
- Implemented DCGAN to generate more images as data augmentation with PyTorch.
  - Trained 6 different classification models with Keras and used own written Adaboost to fuse the best result.
  - Won the 2nd place in the class competition.
- Multispeaker Text-To-Speech Synthesis (TTS) System** | *Python, Tensorflow* Jan. 2020
- Implemented and transfered the model pretrained on English into Chinese version with Tensorflow.
  - Analyzed the effect of acoustic feature to model and improved the model performance.
- Neural Machine Translation** | *Python, Tensorflow* Jan. 2020
- Implemented the NMT model with attention for English-French translation with Tensorflow.
  - Successfully translated some unseen English sentences into French almost the same as Google translation.
- Protein Secondary Structure Prediction with Deep Learning** | *Python, Tensorflow* June 2019
- Implemented the seq2seq model to learn the correlation between protein sequence and its secondary structure.
  - Achieved the performance of the SOTA at that time without any biological computation for the protein sequence.
- Facial Feature Extraction and Application** | *Python, C/C++, Arduino, Raspberry Pi, Azure* Mar. 2019
- Used Azure API and Raspberry Pi to extract human facial feature.
  - Used collected feature to work with Mediatek LinkIt 7688 Duo to control the light and music.
- NTHUEE Camp Website** | *PHP, Bootstrap, MySQL* Aug. 2018
- Developed a web application with control platform.
  - Website: <https://eecamp.nthuee.org>

## TECHNICAL SKILLS

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**Computer Languages:** Python, C/C++, Shell, PHP, HTML, CSS, JavaScript

**Frameworks:** PyTorch, Tensorflow, Keras, Django, Flask

**Developer Tools:** Git, Linux, Google Cloud Platform, Amazon Web Services

**Hardware Developments:** Verilog, RISC-V, Hspice (CAD tools), FPGA, Arduino, Raspberry Pi

**Languages:** Mandarin Chinese (native speaker), good command of English

## EXTRA CURRICULAR

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- Vince Director** July 2018 – June 2019  
*Student Association of NTHU Electrical Engineering Department* Hsinchu, Taiwan
- Planned and held various activities for students in our department.
  - Managed the finance of the association.
- Director** Aug. 2017 – July 2018  
*NTHUEE Camp* Hsinchu, Taiwan
- Organized the teams and planned for the whole week activities.
  - Made decisions for the organizations and emergency.