

# Yung-Hsu Yang

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## EDUCATION

### 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

### 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

### 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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<b>AI CUP 2020 Mango Image Recognition Challenge   Python, PyTorch, Keras</b>	June 2020
<ul style="list-style-type: none"><li>• Implemented DCGAN to generate more images as data augmentation with PyTorch.</li><li>• Trained 6 different classification models with Keras and used own written Adaboost to fuse the best result.</li><li>• Won the 2nd place in the class competition.</li></ul>	
<b>Multispeaker Text-To-Speech Synthesis (TTS) System   Python, Tensorflow</b>	Jan. 2020
<ul style="list-style-type: none"><li>• Implemented and transferred the model pretrained on English into Chinese version with Tensorflow.</li><li>• Analyzed the effect of acoustic feature to model and improved the model performance.</li></ul>	
<b>Neural Machine Translation   Python, Tensorflow</b>	Jan. 2020
<ul style="list-style-type: none"><li>• Implemented the NMT model with attention for English-French translation with Tensorflow.</li><li>• Successfully translated some unseen English sentences into French almost the same as Google translation.</li></ul>	
<b>Protein Secondary Structure Prediction with Deep Learning   Python, Tensorflow</b>	June 2019
<ul style="list-style-type: none"><li>• Implemented the seq2seq model to learn the correlation between protein sequence and its secondary structure.</li><li>• Achieved the performance of the SOTA at that time without any biological computation for the protein sequence.</li></ul>	
<b>Facial Feature Extraction and Application   Python, C/C++, Arduino, Raspberry Pi, Azure</b>	Mar. 2019
<ul style="list-style-type: none"><li>• Used Azure API and Raspberry Pi to extract human facial feature.</li><li>• Used collected feature to work with Mediatek LinkIt 7688 Duo to control the light and music.</li></ul>	
<b>NTHUEE Camp Website   PHP, Bootstrap, MySQL</b>	Aug. 2018
<ul style="list-style-type: none"><li>• Developed a web application with control platform.</li><li>• Website: <a href="https://eecamp.nthuee.org">https://eecamp.nthuee.org</a></li></ul>	

## 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

*NTHUEE Camp*

Aug. 2017 – July 2018

*Hsinchu, Taiwan*

- Organized the teams and planned for the whole week activities.
- Made decisions for the organizations and emergency.