

# Chad(Hao-Chun), Yang

POSTDOC · UNIVERSITY OF TÜBINGEN · MACHINE LEARNING SCIENTIST

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## Professional Experience

### University of Tübingen / Donders Institute

Postdoctoral Researcher, Machine Learning

Germany / Netherland

Mar.2023 - Present

- Conducting research on Unsupervised 3D Representation Learning for robust Anomaly Detection in Medical Imaging.
- Improved psychosis detection by 6.7% AUPRC through Self-Supervised Masked Surface Vision Transformer (MS-ViT)
- Leading the development of a Multi-Modal Foundation Model with Latent Diffusion for Neurodegenerative Disease Detection.

### National Health Research Institutes

Senior Machine Learning Scientist, Domain Transfer and Privacy

Taiwan

Sep.2020 - Apr.2022

- Introduced Privacy-aware (*FedCM*) to enhance heterogeneity in Federated Learning for Multi-Source Alzheimer's Detection.
- Identified and differentiated key Regions of Interest (ROI) related to normal brain degeneration and Alzheimer's disease.
- Mentored students on robust multi-site ADHD detection using Conditional-adversarial Domain Adaptation Network (CDAN).

Machine Learning Scientist, Neurocognitive Assessment using Brain MRI

Sep.2018 - Sep.2020

- Spearheaded MRI research pipeline: Data-Preprocessing (FreeSurfer, SPM), Modeling, and Explainable AI tools (GradCAM++).
- Increased 8.98% UAR for 3-class Alzheimer's detection using 3D Autoencoder with multi-view contrastive loss (*BSEN*).
- Attained STOA UAR of 80.2% in binary Face Processing Ability classification using Event-Contrastive Node2Vec Embedding.

### Behavioral Informatics & Interaction Computation Lab (BIIC)

Doctoral Researcher, Affective Electrophysiology Responses under Audio / Visual Stimuli

Taiwan

Sep.2018 - Apr.2022

- Enhanced physiological emotion recognition by 3.5% UAR through Transformer-based Personalized modeling.
- Achieved an 8% UAR increase in personality recognition using Multi-Head Attention Graph Convolutional Network (GCN).
- Conducted in-depth studies on subjective/intended emotion reactions based on ECG/EDA/EEG signals with Shapley analysis.

## Collaborated Projects

### C-Media Electronics, Inc.

Senior Machine Learning Scientist

Taipei, Taiwan

Jan.2020 - Dec.2021

- Led a team of 5 developing a Real-Time Fully-Convolutional Speech De-reverberation engine with SRMR score 4.774.
- Oversaw the entire R&D pipeline: Data Collection/Synthesis, Model/Metric Design, Error Analysis, and Model Compression.
- Pioneered the development of speech cloning from previously unseen sources using Generative Adversarial Networks (GAN).

### Inventec AI Center

Machine Learning Scientist, Cardiovascular Disease Detection

Taiwan

Jan.2021 - Dec.2021

- Led the development of End-to-End Heart Disease Anomaly Detection system with Time-Series Multi-Lead ECG.
- Proposed Mixed-Domain Self-Attention Resnet (*MDARsn*) to handle missing data and outlier ECG for robust Multi-Label Detection.
- Received the Best Challenge Poster award in the PhysioNet/CinC Challenge 2021 and secured a US patent ([US20230153575A1](#)).

### Institute for Information Industry (III)

Senior Machine Learning Engineer

Taipei, Taiwan

Mar.2020 - Nov.2020

- Led a team of 5 developing a deep video retrieval system to accelerate fake news screening.
- Proposed a novel video retrieval system with 95.1% retrieval precision and orchestrated with Docker.
- The system is adopted by two prominent NGO fake news checkers, [Taiwan FactCheck Center](#) and [MyGoPen](#).

### Gamania Digital Entertainment Co., Ltd.

Machine Learning Engineer

Taipei, Taiwan

Sep.2016 - Sep.2018

- Developed Multi-modal behavior profiling system utilizing Speech, Face, and Gesture for AI-driven hiring recommendations.
- Designed and implemented a real-time, Multi-person Multi-modal data collection system to complement the profiling system.

## Education

### NTHU(National Tsing Hua University)

Ph.D., Electrical Engineering

Hsinchu, Taiwan

Sep.2016 - Apr.2022

- Got President Scholarship which is given to promising students in EE Dept.

### NTHU(National Tsing Hua University)

B.S., Electrical Engineering

Hsinchu, Taiwan

Sep.2012 - Jun.2016

## Skills

**Programming** Python, SQL, C++, Matlab, Bash

**DevOps | Cloud** Git, Docker, Github Actions, Airflow | GCP, AWS

**DL | MLOps** Pytorch, Tensorflow | Spark, MLflow, W&B, SLURM

**Data Science** Scikit-Learn, Numpy, Pandas, Matplotlib, SHAP

**Languages** English, Chinese, (German)

## Teaching

### National Tsing Hua University

Teaching Assistant

- 10720IMS503100: Artificial Intelligence and Entrepreneurship
- 10710EE366200: Digital Signal Processing Laboratory
- 10620EE306001: Probability
- 10610EE648500: Computer Vision

## Honors & Awards

2022	<b>Program Committee Member</b> , IEEE ICKII, IEEE ICEIB, IARIA CENTRIC	
2021	<b>Best Challenge Poster</b> , PhysioNet/CinC Challenge	Computing in Cardiology Society
2019	<b>Travel Grants</b> , 2019 ICASSP SPS Travel Grants	IEEE Signal Processing Society
2018	<b>Scholarship</b> , Paper Presentation Scholarship	ACLCLP, Taiwan
2018	<b>Scholarship</b> , AI Scholarship	Adbertech Inc., Taiwan
2018	<b>Scholarship</b> , President Scholarship	National Tsing Hua University
2015	<b>Scholarship</b> , Summer Academic Exchange Program	Fudan University, China

## Selected Publications ([Google Scholar Profile](#))

### JOURNAL

- [1] **Hao-Chun Yang** and Chi-Chun Lee, “A Media-Guided Attentive Graphical Network for Personality Recognition Using Physiology”  
*IEEE Transactions on Affective Computing* 2021

### PEER-REVIEWED CONFERENCE/WORKSHOP PAPER

- [1] Ya-Lin Huang, **Hao-Chun Yang**, and Chi-Chun Lee, “Federated Learning via Conditioned Mutual Learning for Alzheimer Disease Classification on T1w MRI”  
*43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society, EMBC 2021, (Virtual)*, Nov 1-5, 2021
- [2] **Hao-Chun Yang**, Wan-Ting Hsieh, and Pei-Chun Chen, “A Mixed-Domain Self-Attention Network for Multilabel Cardiac Irregularity Classification Using Reduced-Lead Electrocardiogram”  
*Computing in Cardiology, CinC 2021, Brno, Czech Republic, September 12-15*
- [3] Woan-Shiuan Chien, **Hao-Chun Yang**, and Chi-Chun Lee, “Cross Corpus Physiological-based Emotion Recognition Using a Learnable Visual Semantic Graph Convolutional Network”  
*MM '20: The 28th ACM International Conference on Multimedia, ACMMM 2020, Virtual Event / Seattle, WA, USA, October 12-16, 2020*
- [4] Wan-Ting Hsieh, Jeremy Lefort-Besnard, **Hao-Chun Yang**, Li-Wei Kuo, and Chi-Chun Lee, “Behavior Score-Embedded Brain Encoder Network for Improved Classification of Alzheimer Disease Using Resting State fMRI”  
*42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society, EMBC 2020, Montreal, QC, Canada, July 20-24, 2020*
- [5] Ya-Lin Huang, Wan-Ting Hsieh, **Hao-Chun Yang**, and Chi-Chun Lee, “Conditional Domain Adversarial Transfer for Robust Cross-Site ADHD Classification Using Functional MRI”  
*2020 IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2020, Barcelona, Spain, May 4-8, 2020*
- [6] **Hao-Chun Yang** and Chi-Chun Lee, “A Siamese Content-Attentive Graph Convolutional Network for Personality Recognition Using Physiology”  
*2020 IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2020, Barcelona, Spain, May 4-8, 2020*
- [7] Wan-Ting Hsieh, **Hao-Chun Yang**, Fu-Sheng Tsai, Chon-Wen Shyi, and Chi-Chun Lee, “An Event-contrastive Connectome Network for Automatic Assessment of Individual Face Processing and Memory Ability”  
*IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2019, Brighton, United Kingdom, May 12-17, 2019*
- [8] **Hao-Chun Yang** and Chi-Chun Lee, “An Attribute-invariant Variational Learning for Emotion Recognition Using Physiology”  
*IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2019, Brighton, United Kingdom, May 12-17, 2019*
- [9] **Hao-Chun Yang** and Chi-Chun Lee, “Annotation Matters: A Comprehensive Study on Recognizing Intended, Self-reported, and Observed Emotion Labels using Physiology”  
*8th International Conference on Affective Computing and Intelligent Interaction, ACII 2019, Cambridge, United Kingdom, September 3-6, 2019*
- [10] Wan-Ting Hsieh, **Hao-Chun Yang**, Ya-Tse Wu, Fu-Sheng Tsai, Li-Wei Kuo, and Chi-Chun Lee, “Integrating Perceivers Neural-Perceptual Responses Using a Deep Voting Fusion Network for Automatic Vocal Emotion Decoding”  
*2018 IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2018, Calgary, AB, Canada, April 15-20, 2018*
- [11] **Hao-Chun Yang**, Fu-Sheng Tsai, Yi-Ming Weng, Chip-Jin Ng, and Chi-Chun Lee, “A Triplet-Loss Embedded Deep Regressor Network for Estimating Blood Pressure Changes Using Prosodic Features”  
*2018 IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2018, Calgary, AB, Canada, April 15-20, 2018*