Chad(Hao-Chun), **Yang**

PostDoc · University of Tuebingen · Machine Learning Scientist

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Professional Experience

University of Tuebingen / Donders Institute
Germany / Netherland
Postdoctoral Researcher, Machine Leanring
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
Taiwan
Senior Machine Learning Scientist, Domain Transfer and Privacy
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)
Taiwan
Doctoral Researcher, Affective Electrophysiology Responses under Audio / Visual Stimuli
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.
Taipei, Taiwan
Senior Machine Learning Scientist
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
Taiwan
Machine Learning Scientist, Cardiovascular Disease Detection
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).

Education

NTHU(National Tsing Hua University)
Hsinchu, Taiwan
Ph.D., Electrical Engineering
Sep.2016 - Apr.2022

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

NTHU(National Tsing Hua University)
Hsinchu, Taiwan
B.S., Electrical Engineering
Sep.2012 - Jun.2016

Selected Publications (Google Scholar Profile)

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

[4] 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

Skills

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

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

DL | MLOps Pytorch, Tensorflow | PySpark, 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