Chia-Hsiang Kao

Email chkao.md04@nycu.edu.tw
Website https://iandrover.github.io

Research Interests

Machine Learning & Computer Vision

My goal is to develop robust and interpretable machine learning algorithms and systems that operate reliably even under challenging conditions. Along with my research goals, I am interested in meta-learning, self-supervised learning, model robustness, and explainable AI.

Education

National Yang Ming Chiao Tung University (NYCU) *Taipei, Taiwan*
Doctor of Medicine *Aug. 2015 - Jun. 2022*

- Overall GPA: 3.81/4.0, Major GPA: 3.82/4.0, CS-related GPA: 3.90/4.0

PS: National Yang Ming University (NYMU) and National Chiao Tung University merged in 2021. I originally studied at NYMU.

Publications

MAML Is a Noisy Contrastive Learner in Classification | Paper | Poster | Github *ICLR'22, NeurIPS'21 Workshop*
Chia-Hsiang Kao, Wei-Chen Chiu, Pin-Yu Chen

- Proved that MAML belongs to supervised contrastive learning.
- Proposed a zeroing trick that significantly improves the convergence of MAML.

Demystifying T1-MRI to FDG18-PET Image Translation via Representational Similarity | Paper *MICCAI'21*
Chia-Hsiang Kao, Yong-Sheng Chen, Li-Fen Chen, Wei-Chen Chiu

- Hypothesized and verified that medical image translation models implicitly segment brain tissue types and identify brain regions.

Unravelling the Spatio-Temporal Neurodynamics of Rhythm Encoding-Reproduction Networks by a Novel fMRI Autoencoder | Paper *NER'19*
Chia-Hsiang Kao, Ching-Ju Yang, Li-Kai Cheng, Hsin-Yen Yu, Yong-Sheng Chen, Jen-Chuen Hsieh, Li-Fen Chen

- Proposed a novel auto-encoder to untangle the spatiotemporal patterns of neurodynamics. - Identified the rhythm encoding-reproduction networks of the brain.

Research Experiences

MIT-IBM Watson AI Lab *Massachusetts, USA*
Research Student *Dec. 2020 - Aug. 2021, Jul. 22 - Aug. 2022*

- Advisor: Dr. Pin-Yu Chen/ Co-advisor: Prof. Wei-Chen Chiu
- Proved that MAML is a supervised contrastive learning algorithm. Studied theories of self-supervised learning and adversarial learning.

Brain Mapping Laboratory, National Yang Ming Chiao Tung University *Taipei, Taiwan*
Research Student *Sep. 2017 - Sep. 2020*

- Advisor: Prof. Li-Fen Chen
- Utilized explainable AI tools to understand the inner behavior of image translation models. Analyzed fMRI, MRI, and CT data and built various predictive models.

Institute of Information Science, Academia Sinica *Taipei, Taiwan*
Research Student *Jun. 2017 - Sep. 2017*

- Advisor: Prof. Meng-Chang Chen
- Analyzed air quality data and built air pollution predictive models.

Clinical Experiences

Taipei Veteran General Hospital *Taipei, Taiwan*

Intern Doctor *Oct. 2019 - Sep. 2020 , Jan. 2022 - Jun. 2022*

- Served as a second-year intern doctor in Internal Medicine, Surgery, Pediatrics, OB/GYN, ICU, Emergency Medicine, Family Medicine, etc. I was responsible for the primary care of the inpatient in those departments.

Chi Mei Medical Center *Tainai, Taiwan*

Intern Doctor *Nov. 2021 - Dec. 2021*

- Served as an intern doctor in Internal Medicine and Emergency Medicine.

Fellowships and Awards

- **Student Travel Award**, MICCAI'21: To first author student with the highest scoring *2021*
- **Undergraduate Research Fellowship**, National Science and Technology Council, Taiwan *2018, 2020*
- **Summer Research Fellowship**, National Health Research Institutes, Taiwan *2018*

Skills & Others

Paper Review	Computer Vision and Image Understanding, AutoML'22, NeurIPS'21 Workshop
Languages	Mandarin (Native); English (Fluent, TOEFL 106/120)
Programming	Python, JavaScript, Matlab
Libraries	TensorFlow, Keras, Jax, PyTorch, OpenCV, Scikit-learn
Interests	Writing, Reading, Travel, Swimming, Backpacking, Jogging