

Chia-Hsiang Kao

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Website: <https://iandrover.github.io/>

Research interests: computer vision, learning with small data, adversarial learning, medical image analysis.

Research goal: Increase understanding, robustness and explainability of ML models, and improve healthcare.

EDUCATION

Medical Doctor, National Yang Ming Chiao Tung University, Taiwan. GPA: 3.92/4.3

Aug 2015 — Jun 2022

Advisor: Prof. Li-Fen Chen (NYCU), Prof. Wei-Chen Chiu (NYCU), Dr. Pin-Yu Chen (IBM Research) and Prof. Albert C. Yang (NYCU).

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

PS: In Taiwan, high school students can be directly admitted to medical schools without Bachelor's degree.

PUBLICATIONS

MAML is a Noisy Contrastive Learner, submitted to ICLR 2022 [arxiv]

Chia-Hsiang Kao, Wei-Chen Chiu, and Pin-Yu Chen.

- Contribution: Under mild assumption, prove that MAML (the most famous gradient-based meta-learning algorithm) is a supervised contrastive learning algorithm.
- Contribution: Identify two interference terms in MAML and propose a zeroing trick (that comes from our derivation) which significantly improves MAML.

Demystifying T1-MRI to FDG18-PET Image Translation via Representational Similarity, MICCAI 2021 oral presentation [pdf]

Chia-Hsiang Kao, Yong-Sheng Chen, Li-Fen Chen, Wei-Chen Chiu.

- Contribution: Hypothesize and empirically validate that deep learning-based cross-medical image translation models implicitly perform brain tissue types and brain region recognition to transform T1-MR to FDG-PET images.

Unravelling the Spatio-Temporal Neurodynamics of Rhythm Encoding-Reproduction Networks by a Novel fMRI Autoencoder, International IEEE/EMBS Conference on Neural Engineering (NER) 2019 [link]

Chia-Hsiang Kao, Ching-Ju Yang, Li-Kai Cheng, Hsin-Yen Yu, Yong-Sheng Chen, Jen-Chuen Hsieh, and Li-Fen Chen.

- Contribution: Propose a novel autoencoder model to incorporate spatial and temporal patterns of functional neurodynamics and identify the rhythm encoding-reproduction networks of the brain.

SERVICES, AWARDS AND SCHOLARSHIPS

Junior Reviewer, Workshop on Meta-Learning, NeurIPS 2021

2021

College Student Research Scholarships, Ministry of Science and Technology, Taiwan

2020

College Student Research Scholarships, Ministry of Science and Technology, Taiwan

2018

Summer Research Scholarships, National Health Research Institutes and the Foundation of Health Sciences, Taiwan

2018

EXPERIENCES

Clinical Intern, Taipei Veteran General Hospital, Taiwan

Oct 2019 – Sep 2020, Dec 2021 – Jun 2022

Research Intern, Laboratory of Precision Psychiatry

Sep 2021 – Jun 2022

- Advisor: Prof. Albert C. Yang

Visiting student and Research Intern, Enriched Vision Applications Lab

Sep 2020 – Sep 2021

- Advisors: Prof. Chiu-Wei Chen, and Dr. Ping-Yu Chen (IBM Research)

Research Intern, Brain Mapping Laboratory

Sep 2017 – Sep 2020

- Advisor: Prof. Li-Fen Chen

Student, Summer School, Institute of Mathematics, Academia Sinica

Jun 2018 – Sep 2018

Data analyst, Data for Social Good (D4SG) program, Taiwan

Nov 2017 – Mar 2018

Research Intern, Institute of Information Science, Academia Sinica

Jun 2017 – Sep 2017

- Advisor: Prof. Meng-Chang Chen

SKILLS

Frameworks. Python, Matlab; Tensorflow, Pytorch, OpenCV, Scikit-Learn

Mathematics. Introduction to Analysis - Honor Class (A-), Advanced Probability (A), Theory of Computability (A+)

Others. Reinforcement Learning (A+)