Chia-Hsiang Kao

Updated October 18, 2021

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

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

Research goal: Investigate mechanisms, robustness and explanability of ML models; 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, NYCU Sep 2021 – Jun 2022
- Advisor: Prof. Albert C. Yang

Visiting student and Research Intern, Enriched Vision Applications Lab, NYCU Sep 2020 – Sep 2021
- Advisors: Prof. Chiu-Wei Chen, and Dr. Ping-Yu Chen (IBM Research)

Research Intern, Brain Mapping Laboratory, NYCU 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+)