

# Chia-Hsiang Kao

Updated October 18, 2021

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

**Research goal:** Increase understanding, robustness and explainability of ML models, and benefit 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+)