

## Research Interests

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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 model robustness, unbiased and generalized representation learning, explainable AI, and healthcare applications.

## Education

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**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 in NYMU.

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

## Publications

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- **MAML is a Noisy Contrastive Learner** | [Paper](#) | [Slides](#) |  
*Chia-Hsiang Kao, Wei-Chen Chiu, and Pin-Yu Chen*  
[ICLR'22] [NeurIPS'21 workshop, oral presentation]
  - Proved that MAML belongs to supervised contrastive learning.
  - Proposed a zeroing trick that significantly improves the convergence of MAML.
- **Demystifying T1-MRI to FDG<sup>18</sup>-PET Image Translation via Representational Similarity** | [Paper](#) |  
*Chia-Hsiang Kao, Yong-Sheng Chen, Li-Fen Chen, and Wei-Chen Chiu*  
[MICCAI'21, oral presentation]
  - 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](#) |  
*Chia-Hsiang Kao, Ching-Ju Yang, Li-Kai Cheng, Hsin-Yen Yu, Yong-Sheng Chen, Jen-Chuen Hsieh, and Li-Fen Chen*  
[NER'19 (International IEEE/EMBS Conference on Neural Engineering)]
  - Proposed a novel autoencoder to untangle the spatio-temporal patterns of neurodynamics.
  - Identified the rhythm encoding-reproduction networks of the brain.

## Research Experiences

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**Laboratory of Precision Psychiatry, National Yang Ming Chiao Tung University**

**Taipei, Taiwan**

*Research Student*

*Sep. 2021 - Jun. 2022*

- Advisor: Professor [Albert Chih-Chieh Yang](#).
- Estimated patients' cognitive function based on their drawings.

**Enriched Vision Applications Lab, National Yang Ming Chiao Tung University**

**Hsinchu, Taiwan**

*Research Student*

*Sep. 2020 - Sep. 2021*

- Advisor: Professor [Wei-Chen Chiu](#) and MIT-IBM Watson AI Lab Researcher [Pin-Yu Chen](#).
- 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: Professor [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 Intern*

*Jun. 2017 - Sep. 2017*

- Advisor: Professor [Meng-Chang Chen](#).
- Analyzed air quality data and built air pollution predictive models.

## Clinical Experiences

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### Taipei Veteran General Hospital

Taipei, Taiwan

Medical Intern

Jan. 2022 - Jun. 2022

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

### Chi Mei Medical Center

Tainai, Taiwan

Medical Intern

Nov. 2021 - Dec. 2021

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

### Taipei Veteran General Hospital

Taipei, Taiwan

Medical Intern

Oct. 2019 - Sep. 2020

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

## Scholarships, Honors, and Services

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- **Junior Reviewer**, NeurIPS'21 Workshop Oct. 2021
- **Student Travel Award**, MICCAI'21: To first author student with the highest scoring. Jun. 2021
- **College Student Research Scholarships**, Ministry of Science and Technology, Taiwan Jul. 2020
- **College Student Research Scholarships**, Ministry of Science and Technology, Taiwan Jul. 2018
- **Summer Research Scholarships**, National Health Research Institutes, Taiwan Jul. 2018

## Courses


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Computer Science *	Introduction to Computer Science	A+
	Java Programming Language <sup>G</sup>	B+
	Theory of Computability <sup>G</sup>	A+
	Machine Learning <sup>G</sup>	A+
	Reinforcement Learning <sup>G</sup>	A+
Computer Science **	Data Structures and Algorithms	
	Operative Systems	
Mathematics *	Calculus (Honor)	B+
	Probability	A-
	Introduction to Analysis (Honor)	A-
	Advanced Probability <sup>G</sup>	A
Mathematics **	Linear Algebra	
	Statistics	
	Differential Equation	

\* courses; \*\* self-learn; <sup>G</sup> graduate-level course

## Skills and Others

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Languages	Mandarin (Native) English (Fluent, TOEFL: 106/120)
Programming	Python (PyTorch, TensorFlow, Keras, OpenCV, Scikit-learn) MATLAB JAVA
Interests	Jogging and Writing [  Medium]