Chia-Hsiang (Aaron) Kao

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Education

Cornell University, *Ithaca, NY, USA* *2023 - Present*

- Ph.D. Student in Computer Science
- Advisor: Prof. Bharath Hariharan and Prof. Kavita Bala

National Yang-Ming University, *Taipei, Taiwan* *2015 - 2022*

- Doctor of Medicine
- Advisor: Prof. Wei-Chen Chiu and Dr. Pin-Yu Chen

Research

Current Research (2024-Present)

- Multi-modal Scientific LLM
  - Developing a self-reflective question-answering system for remote sensing
  - Integrating multi-modal inputs (text, image, code) with minimal training and fine-tuning
- Computational Biology
  - Developing LLM for de novo peptide sequencing for mass spectrometry

Previous Research Contributions

- Learning Algorithms
  - Demonstrated equivalence between meta-learning and contrastive learning [2]
  - Developed a simple and efficient algorithm for federated learning [3]
  - Designed a novel non-backpropagation algorithm for efficient neural training [7]
- Biomedical + AI
  - Created interpretable AI solutions for medical imaging analysis [1]
  - Developed long-context DNA modeling techniques [4,5]

Publications

[7] Counter-Current Learning: A Biologically Plausible Dual Network Approach for Deep Learning
Chia-Hsiang Kao, Bharath Hariharan
In NeurIPS 2024

[6] AllClear: A Comprehensive Dataset and Benchmark for Cloud Removal in Satellite Imagery
Chia-Hsiang Kao*, Hangyu Zhou*, Cheng Perng Phoo, Utkarsh Mall, Bharath Hariharan, Kavita Bala
In NeurIPS Datasets and Benchmarks Track 2024

[5] Caduceus: Bi-Directional Equivariant Long-Range DNA Sequence Modeling
Yair Schiff, ***Chia-Hsiang Kao***, Aaron Gokalsan, Tri Dao, Albert Gu, Volodymyr Kuleshov
In ICML 2024

[4] Advancing DNA Language Models: The Genomics Long-Range Benchmark
Chia-Hsiang Kao*, Evan Trop*, McKinley Polen*, Yair Schiff*, Bernardo P. de Almeida, Aaron Gokaslan, Thomas Pierrot, Volodymyr Kuleshov
In AAAI (workshop) 2023

[3] FedBug: A Bottom-Up Gradual Unfreezing Framework for Federated Learning
Chia-Hsiang Kao, Yu-Chiang Frank Wang
In arXIv 2023

[2] MAML Is a Noisy Contrastive Learner in Classification
Chia-Hsiang Kao, Wei-Chen Chiu, Pin-Yu Chen
In ICLR 2022

[1] Demystifying T1-MRI to FDG18-PET Image Translation via Representational Similarity
Chia-Hsiang Kao, Yong-Sheng Chen, Li-Fen Chen, Wei-Chen Chiu
In MICCAI 2021

Honors & Awards

- Student Travel Award, MICCAI 2021 *2020*
- Undergraduate Research Fellowship, National Science and Technology Council, Taiwan *2018, 2020*
- Summer Research Fellowship, National Health Research Institutes *2018*

Services

Conference Reviewer: NeurIPS'21 workshop, AutoML'22, NeurIPS'24, ICLR'25, AAAI'25, AISTAT'25
Journal Reviewer: CVIU (2022), Comput. Electr. Eng. (2024), IEEE TETCI (2024)