

Jyun-Ping Kao

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EDUCATION

- **National Taiwan University** July 2023 - Present
MS in Biomedical Electronics and Bioinformatics Taipei, Taiwan
 - GPA: 4.3/4.3 (Program Ranked: 1/62)
 - Awards: Outstanding Paper Award (Published in a JCR Top 15% journal)
- **National Yang Ming Chiao Tung University** Sep 2019 - Jun 2023
BS in Electronics and Electrical Engineering (Double Major) Taipei & Hsinchu, Taiwan
BS in Digital Healthcare (Double Major)
 - GPA: 3.8/4.3
 - Awards: Phi tau Phi Awards (Top 1 % graduates based on 4-year cumulative GPA)

RESEARCH EXPERIENCE

- **Harvard Medical School & Massachusetts General Hospital** July 2025 - Present
Visiting Research Student, Department of Radiology Boston, MA, United States
 - Develop the first Low-Rank Adaptation method for the computer vision foundation model to transfer learning from CT to MRI and achieved the SOTA best accuracy on the ADHD MRI dataset.
 - Developed an explainable, lightweight multi-task Green Learning model that couples a pretrained Vox-elHop encoder with an XGBoost classification head to jointly classify and segment 3D echocardiography ultrasound and beats conventional 3D models.
- **National Taiwan University Hospital** July 2023 - June 2025
Research Assistant, Department of Physical Medicine and Rehabilitation Taipei, Taiwan
 - Developed the first LoRA-enhanced real-time Detection Transformer model for musculoskeletal ultrasound imaging that solves the domain-shift problem in fine-tuned models and reduces trainable parameters by > 99 % while preserving high detection accuracy.
 - Integrated low-rank adaptation techniques into transformer-based architectures to facilitate efficient fine-tuning on limited, institution-specific datasets, effectively addressing data scarcity and privacy constraints.
 - Developed the first LLM for multi-image musculoskeletal ultrasound, synthesizing 12-frame shoulder exams into a unified radiologist-style impression with consistent laterality and strong report similarity.
 - Led clinical collaborations by overseeing participant recruitment, managing comprehensive data collection protocols, and supervising meticulous data annotation to ensure high research quality and reproducibility.
- **The University of Hong Kong** Jun 2024 - Aug 2024
Visiting Research Student, Department of Orthopaedics and Traumatology Hong Kong
 - Developed a deep learning-based ultrasound assessment tool for the Posterior Cruciate Ligament, achieving near-perfect location detection and under 5% error in width and angle measurements.
 - Implemented real-time inference pipelines that eliminate heavy segmentation overhead, enabling efficient, operator-independent ligament evaluation and reducing reliance on MRI.
 - Designed specialized labeling strategies and post-processing algorithms to translate bounding box coordinates directly into clinically meaningful measurements.
 - Organized and led data collection with orthopedic specialists, recruiting participants, acquiring knee ultrasound videos, and performing high-fidelity data labeling for robust model training.
- **National Yang Ming Chiao Tung University** July 2020 - July 2023
Undergraduate Research Student, Institute of Biophotonics Taipei, Taiwan
 - Developed the first 3D conditional Generative Adversarial Network (cGAN) for Femto-Laser Scanning Microscopy, enabling the generation of high-quality harmonic generation images from confocal images.
 - Implemented deep-learning models for image generation and analysis of human-skin samples.
 - Designed and optimized optical systems in laser microscopy, incorporating non-linear optics for advanced imaging and simulation

- [T.1] **Jyun-Ping Kao (2025). Advancing Computer-Aided Diagnosis in Musculoskeletal Ultrasound: First Low-Rank Adaptation Based DETR for Real-Time Full Body Anatomical Structures Identification with Prospective Study in Intelligent Diagnosis Using Large Language.** *Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University. Final Grade: A+*
Advisors: **Chung-Ping Chen Ph.D.; Wen-Shiang Chen M.D., Ph.D.**
- [S.1] **Kao, J. P.*, J., Yang*, Kuo, C. C. Jay, & Woo, J. (2025). Interpretable and backpropagation-free Green Learning for efficient multi-task echocardiographic segmentation and classification.** *Radiology: Artificial Intelligence*, (Under Peer Review).
- [S.2] **Kao, J. P., Zhang, J., Lee, W. N., Chen, C. P., & Lau, C. M. Lawrence (2025). A Novel Deep Learning Based Automatic Ultrasonic Posterior Cruciate Ligament Clinical Assessment Tool.** *npj Artificial Intelligence*, (Under Peer Review).
- [S.3] **Kao, J. P., Rho, S., Lazarev, S., Cho, H. H., Xing, F., Liu, X., El Fakhri, G., Shin, T., Kuo, C. C. Jay & Woo, J. (2025). Cross-Modal Fine-Tuning of Foundation Models for ADHD Classification via First Low-Rank Adaptation.** *2026 IEEE International Symposium on Biomedical Imaging (ISBI)*, (Under Peer Review).
- [J.1] **Kao, J. P., Chung Y. C., Hung, H. Y., Chen, C. P., & Chen, W. S. (2025). LoRA-Enhanced RT-DETR: First Low-Rank Adaptation Based DETR Model and Enable Real-Time Full Body Anatomical Structures Detection in Musculoskeletal Ultrasound.** *Computerized Medical Imaging and Graphics*, (2025): 102583. (JCR Q1)
- [C.1] **Kao, J. P., Chen, C. P., & Chen, W. S. (2025). MULTI-IMAGE MUSCULOSKELETAL ULTRASOUND INTERPRETATION USING A LARGE LANGUAGE MODEL.** *Radiological Society of North America Annual Meeting (RSNA 2025)*.
- [J.2] **Kao, J. P. & Kao, H. T. (2025). Large Language Models in Radiology: A Technical and Clinical Perspective.** *European Journal of Radiology Artificial Intelligence*, 100021.
- [C.2] **Kao, J. P., Hung, H. Y., Chen, P. X., Chen, C. P., & Chen, W. S. (2024). Transformer Based Real Time Musculoskeletal Anatomical Structure Detection in Clinical Use.** *The IEEE International Conference on Bioinformatics & Bioengineering*, IEEE. Nov 2024, Kragujevac, Serbia.
- [C.3] **Hung, H. Y., Kao, J. P., Chu, H. Y., Chen, C. P., & Chen, W. S. (2024). Real Time Musculoskeletal Ultrasound Image Annotations.** *The 10th Biomedical Imaging and Sensing Conference (BISC2024)*, SPIE. 2024, Yokohama, Japan.
- [J.3] **Chu, H. Y., Wu, C. H., Chen, P. X., Hung, H. Y., Kao, J. P., Chen, C. P., & Chen, W. S. (2024). Enhancing Multi-Object Detection in Ultrasound Images through Semi-Supervised Learning, Focal Loss, and Relation of Frame.** *Ultrasound in Medicine & Biology* 50 (12), 1868-1878.
- [C.4] **Yu-Yang Chang, Shih-Hsuan Chia, Jyun-Ping Kao, et al. (2024). Enhanced In Vivo Skin Diagnostics: A Comparative Study of Reflective Confocal Microscopy and Harmonic Generation Microscopy.** *2024 Optics & Photonics Taiwan International Conference (OPTIC)*. Dec 2024, Taiwan.
- [C.5] **Jyun-Ping Kao, et al. (2023). Deep-Learning-Enabled Third-Harmonic-Generation Imaging for Skin Virtual Biopsy from Reflectance Scanning Microscope.** *2023 Optics & Photonics Taiwan International Conference (OPTIC)*. Dec 2023, Taiwan.
- [C.6] **Jyun-Ping Kao, et al. (2022). Optical design and realization of nonlinear mesoscope.** *2022 Optics & Photonics Taiwan International Conference (OPTIC)*. Dec 2022, Taiwan.

PROFESSIONAL EXPERIENCE

• Invited Journal Peer Reviewer (30 manuscripts in total)

<i>International Journal of Medical Informatics (JCR Q1), 9 manuscripts</i>	May - Nov 2025
<i>Journal of Imaging Informatics in Medicine (JCR Q1), 2 manuscripts</i>	Sep - Nov 2025
<i>IEEE Journal of Biomedical and Health Informatics (JCR Q1), 4 manuscripts</i>	Apr - Oct 2025
<i>Computerized Medical Imaging and Graphics (JCR Q1), 7 manuscripts</i>	Mar - Oct 2025
<i>Heliyon (JCR Q1), 1 manuscript</i>	Oct 2025
<i>Biomedical Signal Processing and Control (JCR Q1), 6 manuscripts</i>	Apr - Sep 2025
<i>Artificial Intelligence In Medicine (JCR Q1), 1 manuscript</i>	June 2025

• Invited Conference Paper Peer Reviewer

<i>IEEE International Symposium on Biomedical Imaging (ISBI)</i>	Oct 2025
<i>IEEE Conference on Systems, Process & Control</i>	Oct 2025
<i>International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)</i>	Feb 2025

HONORS AND AWARDS

- **Outstanding Paper Award** Oct 2025
Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University
 - Thesis published in a journal ranked in the top 15% by JCR and awarded a \$340 USD scholarship.
- **International Conference Travel Grant** Oct 2025
Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University
 - Received the International Conference Travel Grant with \$550 USD to present at the Radiological Society of North America Annual Meeting (RSNA 2025).
- **Graduate Student Research Scholarship** June 2025
Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University
 - Awarded a \$1,200 USD scholarship to support research activities.
- **2025 Intel Artificial Intelligence Innovation Application Competition** May 2025
Intel Greater Bay Area Innovation Center, China
 - Achieved Semi-Finalist for a project employing a graph neural network for decision making with Intel AI PC.
- **International Conference Travel Grant** Nov 2024
National Science and Technology Council (NSTC), Taiwan
 - Received the NSTC International Conference Travel Grant with \$1,250 USD to present at the 24th IEEE International Conference on Bioinformatics and Bioengineering.
- **The University of Hong Kong Summer Research Scholarship** Aug 2024
The University of Hong Kong
 - Awarded The University of Hong Kong Summer Research Scholarship of \$2,570 USD for participation in the 2024 Summer Research Program.
- **The Phi Tau Phi Scholastic Honor Society of the Republic of China Honorary Membership** July 2023
The Phi Tau Phi Scholastic Honor Society of the Republic of China, Taiwan
 - Awarded to the top 1% of undergraduate students at National Yang Ming Chiao Tung University for outstanding academic achievement.
- **2023 Synopsys ARC AIoT Design Contest Award – Finalist** Jun 2023
Synopsys, Taiwan
 - Achieved Finalist status for a project utilizing deep learning on Synopsys ARC EM9D Processors for super-resolution in microscopic imaging.
- **Undergraduate Research Fellowship** Feb 2023
Ministry of Science and Technology (MOST), Taiwan
 - Awarded by the MOST valued \$1,510 USD. The funded research focused on generating nonlinear optical microscopy images from fundamental microscopic images using generative AI, including optical system design.
- **2022 Intel DevCup x OpenVINO Toolkit Award – Finalist** Feb 2022
Intel Corporation, Taiwan
 - Achieved Finalist status for a project employing deep learning with the Intel OpenVINO Toolkit for edge computing applications in microscopic image generation.
- **2021 Intel DevCup x OpenVINO Toolkit Award – Second Place** Jan 2022
Intel Corporation, Taiwan
 - Secured Second Place with prize valued at \$1,200 USD for developing a deep learning solution with the Intel OpenVINO Toolkit for edge computing, focused on analyzing ECG and GWAS data for Hemochromatosis prediction.

EXTRACURRICULAR EXPERIENCE

- **Teaching Assistant** Sep 2023 - Jun 2025
National Taiwan University
 - 2025 Spring : Management of Technological Innovation, College of Electrical Engineering and Computer Science
 - 2024 Fall : Introduction to Biomedical Engineering, College of Electrical Engineering and Computer Science
 - 2023 Fall, 2024 Spring : Service Learning, College of Electrical Engineering and Computer Science
- **Teaching Assistant** Feb 2021 - Jun 2022
National Yang Ming Chiao Tung University
 - 2022 Spring : Calculus, College of Life Sciences
 - 2021 Spring : Laboratory in Fundamental Genetics and its Applications, College of Life Sciences
- **President of Yang Ming Board Game Club** Sep 2021 - Jun 2022
National Yang Ming Chiao Tung University
 - Founder of Yang Ming Board Game Club
- **Student councilor** Sep 2020 - Jun 2021
National Yang Ming Chiao Tung University
 - Supervised student council operations, audited budgets, and revised regulations.