Kuan-Lin (Brian) Chen

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EDUCATION

National Taiwan University, M.S. in Communication Engineering (GPA 4.1/4.3) — TAIPEI, TAIWAN, Sep. 2024–Present

National Pingtung University, B.S. in Intelligent Robotics (GPA 3.7/4.0) — PINGTUNG, TAIWAN, Sep. 2020–Jun. 2024

WORK EXPERIENCE

Institute of Information Science, Academia Sinica

TAIPEI, TAIWAN, Jul. 2025–Aug. 2025

Research Assistant [intern]

- Focus on multimodal generation, built a motion-conditioned LDM pipeline to synthesize music from dance motion, including data preparation and train/eval workflows.
- Reduced FAD from 4.96 to 2.86 (~−42.3%), indicating markedly better perceptual audio quality.

RESEARCH EXPERIENCE

Digital Image and Signal Processing Laboratory (NTU)

TAIPEI, TAIWAN, Sep. 2024–Present

Research Assistant

- Focus on semantic image segmentation tasks and image quality assessments (IQA).
  - Utilized semantic segmentation for motion blur detection.
  - Developed automatic white balance (AWB) for camera imaging systems, outperforming SOTAs in specific scenes using statistical methods and optimization.
  - Proposed IQA method outperforms advanced model in evaluating camera noisy images.
- Research survey on the performance and applications of Kolmogorov-Arnold Networks (KANs).
  - Explored various architectures on classification and regression tasks, and data analysis.

Advanced Intelligent System Laboratory (CCU)

CHIAYI, TAIWAN, Aug. 2021–Jun. 2024

Research Assistant

- Developed a two-stage Deep Reinforcement Learning (DRL) framework to train the humanoid robot Nao for object grasping and placement tasks, achieving a success rate exceeding **90%**.
- Used wavelet transform (WT) and neural networks to train robot OP3 for adaptive gait control on inclined surfaces, achieving stability with WT and LSTM, and trajectory deviation under **0.05**.
- Trained OP3 and Nao robots with DRL and InfoGAN for visual-based decision-making, achieving superior success rates using Proximal Policy Optimization (PPO) over A2C, TRPO.
- Analyzed stroke rehabilitation using ML models and optimization algorithm for feature selection, achieving the best R^2 score of **0.5453** with an ensemble of MLP, Random Forest, and Adaboost.
- Utilized Grad-CAM with pre-trained models to effectively localize pneumonia in chest X-rays, achieving an F1 score of **0.948** and enabling precise lesion detection.

PUBLICATIONS

Journal Papers

- P.-H.Kuo and **K.-L.Chen**, "Controlling a Humanoid Robot Through a Framework that Combines a Large Language Model With Deep Reinforcement Learning," Engineering Applications of Artificial Intelligence, under review.
- P.-H.Kuo, **K.-L.Chen**, Y.-S.Lin, Y.-C.Chiu, and C.-C.Peng, "Deep reinforcement learning–based collision avoidance strategy for multiple unmanned aerial vehicles," Eng. Appl. Artif. Intell., vol. 160, p. 111862, Nov.2025, doi: 10.1016/j.engappai.2025.111862.

- P.-H.Lin, P.-H.Kuo, and **K.-L.Chen**, "Developmental Prediction of Poststroke Patients in Activities of Daily Living by Using Tree-Structured Parzen Estimator–Optimized Stacking Ensemble Approaches," IEEE J. Biomed. Heal. Informatics, 2024.
- C.-W.Jan, Y.-J.Chiu, **K.-L.Chen**, T.-C.Yao, andP.-H.Kuo, "Optical Based Gradient-Weighted Class Activation Mapping and Transfer Learning Integrated Pneumonia PredictionModel.," Comput. Syst. Sci. Eng., vol. 47, no. 3, 2023.
- P.-H.Kuo and **K.-L.Chen**, "Two-stage fuzzy object grasping controller for a humanoid robot with proximal policy optimization," Eng. Appl. Artif. Intell., vol. 125, p. 106694, Oct.2023, doi: 10.1016/j.engappai.2023.106694.
- P.-H.Kuo, J.Hu, **K.-L.Chen**, W.-H.Chang, X.-Y.Chen, and C.-J.Huang, "Sequential sensor fusion-based W-DDPG gait controller of bipedal robots for adaptive slope walking," Adv. Eng. Informatics, vol. 57, p. 102067, Aug.2023, doi: 10.1016/j.aei.2023.102067.
- P.-H.Kuo, W.-C.Yang, P.-W.Hsu, and **K.-L.Chen**, "Intelligent proximal-policy-optimization-based decision-making system for humanoid robots," Adv. Eng. Informatics, vol. 56, p. 102009, Apr.2023, doi: 10.1016/j.aei.2023.102009.

Conference Papers

- K.-Y. Chen, **K.-L. Chen**, Y.-C. Yu and J-J. Ding, "Guitar Tone Morphing by Diffusion-based Model," 2025 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA 2025)
- Y.-K. Lee, **K.-L.Chen** and J.-J.Ding, "FRIEREN: Face Resizing Image Quality Evaluation via Robust Estimation of Image Naturalness,"2025 Asia Pacific Conference on Circuits and Systems (APCCAS 2025).
- **K.-L.Chen** and J.-J.Ding, "Enhancement of Semantic Segmentation with Edge Networks Using Wavelets and Adaptive Canny Thresholding,"2025 International Conference on Imaging, Signal Processing and Communications (ICISPC 2025).
- **K.-L.Chen** and J.-J.Ding, "Kolmogorov-Arnold Networks with Trainable Activation Functions for Data Regression and Classification,"2025 International Conference on Artificial Intelligence in Information and Communication (ICAIIC 2025).
- P.-H.Kuo and **K.-L.Chen**, "Deep Reinforcement Learning Based Controller for UAVs,"2023 International Automatic Control Conference (CACS 2023).
- **K.-L.Chen** and P.-Y.Yang, "Denoising Diffusion Implicit Models for Image Generation,"2023 International Automatic Control Conference (CACS 2023).
- P.-H.Kuo, J.Hu, **K.-L.Chen**, W.-H.Chang, X.-Y.Chen, and C.-J.Huang, "DDPG Based Gait Controller for Bipedal Robots,"2022 International Conference on Fuzzy Theory and Its Applications (iFuzzy 2022)

AWARDS

CIE 2023 Honorable Award

2023/07

- Researched audio-to-image conversion using Conditional GANs, earning Honorable Mention in the Information Technology category of the 2023 Student Engineering Papers Competition, Chinese Institute of Engineers (CIE).

PROFESSIONAL SERVICE

Peer Reviewer, *Engineering Applications of Artificial Intelligence* (Elsevier)

- Conducted **11** peer reviews for Engineering Applications of Artificial Intelligence (ISSN: 0952-1976), a leading journal in AI and engineering applications.
- Reviewed topics spanning deep reinforcement learning (DRL), digital image processing (DIP), and robotics, contributing to the quality and rigor of academic research in the field.

PROFESSIONAL SKILLS

Languages: English (Advanced), Mandarin (Native)
Programming: Python (5 years), MATLAB, HTML, CSS, Java
Frameworks & Libraries: PyTorch, HuggingFace Transformers, Diffusers, Librosa, Scikit-learn, OpenCV
Model Experience: Experienced in LoRA fine-tuning, prompt engineering, RAG integration, and multi-agent LLM collaboration, neural networks
Image & Camera Processing : Familiar with ISP pipeline, including AWB, AE, CCM. Experienced in IQA, motion blur detection, and traditional enhancement techniques.