Yueh-Po **Peng**

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Experience

Institute of Information Science, Academia Sinica — *Taipei, Taiwan*

Research Assistant — *Jul. 2024 - Present*

Supervisor: Dr. Li Su — *Mar. 2022 - Jun. 2023*

Research Topics: *Self-Supervised Learning, Medical Imaging*

- Surveyed end-to-end **self-supervised learning** methods for decoding mental states from brain activity (fMRI).
- Conducted **distributed training** experiments on large-scale, **high-resolution 4D medical image (fMRI)** using **TWCC HPC**.
- Proposed a whole-brain feature selection method for decoding musical pitch from brain activity (fMRI) [2].

Tomofun — *Taipei, Taiwan*

Research & Development - AI Intern — *Mar. 2023 - Jul. 2024*

Research Topics: *Computer Vision, Large Language Models, Multimodal Learning*

- Developed an automatic **short music video generation system** for daily pet clips.
- Developed APIs for **visual large language models (e.g., LLaVA)** with **llama.cpp**/**ollama** to generate image-caption pair datasets.
- Developed pipeline for **fine-tuning** visual language model (e.g., BLIP) and improved **visual question answering performance by 20.6%**.
- Enhanced LLaVA image **inference speed by 250%** with only a 3% reduction in accuracy.

Education

National Taiwan University — *Taipei, Taiwan*

M.S. in Data Science — *Feb. 2023 - Jun. 2024*

- Thesis topic: Whole-Brain Feature Selection Methods for Decoding from fMRI Data

National Taiwan University — *Taipei, Taiwan*

B.S. in Computer Science and Information Engineering (CSIE) — *Sep. 2019 - Jan. 2022*

Research & Project

Guitar Effect Removal (Collaboration with Positive Grid ML team) — *Pytorch, Lightning*

Machine Learning Research on Removing Distortion Effect from Electric Guitar

- Proposed a two-stage method to remove distortion effects from guitar recordings using **Positive Grid VST plugins**.
- Our model achieves **20% higher audio quality** than the best baseline, rated by 26 professional guitarists.
- Published in DAFx 2024 [1]. (**paper**, **demo**)

Whole Brain fMRI Features Selection — *Pytorch, Scikit-learn*

Machine Learning Research to Find Correlation Between FMRI and Musical Pitch

- Proposed a two-stage method to extract fMRI features and predict musical pitch.
- Analyzed pitch and fMRI correlations, showing our method outperforms ROI-based feature selection by **2-fold**.
- Published in ICASSP 2023 [2]. (**paper**)

Publications

[1] Lee, Y. S.*, **Peng, Y. P.***, Wu, J. T., Cheng, M., Su, L., & Yang, Y. H., "Distortion recovery: A two-stage method for guitar effect removal," in Proc. Int. Conf. Digital Audio Effects 2024 (DAFx'24). (* equally contributed)

[2] Cheung, V. K.*, **Peng, Y. P.***, Lin, J. H., & Su, L., "Decoding Musical Pitch from Human Brain Activity with Automatic Voxel-Wise Whole-Brain FMRI Feature Selection," in Proc. IEEE International Conference on Acoustics, Speech and Signal Processing 2023 (ICASSP'23). (* equally contributed)

Skills

Languages/Frameworks Python, Pytorch, Tensorflow, Pandas, Sklearn, Slurm, Flask, HTML, Javascript, C++, C, Linux

Skillset Machine Learning, Self-Supervised Learning, Medical Image, Music Information Research, Distributed Training