Jia-Wei Liao

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Summary

I am Jiawei. My research focuses on Deep Learning and Computer Vision. Currently, I serve as a Research Assistant at Academia Sinica and lead a team investigating Generative AI. My interest extends to Data Science, evident from my year-long tenure as a Data Analyst Intern at Appier. During the internship, I engaged in client data analysis, feature engineering, business model development, and established key business metrics. My commitment to clean code architecture, design patterns, and high-quality programming was nurtured during my time at Appier. I possess strong communication and presentation skills, honed through extensive cross-department collaboration. Passionate about contributing to innovation, I am eager to apply my skills to solve challenging problems in the technology industry and open to discussions about potential collaborations.

Education

National Taiwan University (NTU) Sep 2022 - Present
PhD Student of Computer Science and Information Engineering · CMLab · NTU DAC · TMBA ***GPA: 4.30 / 4.30***

National Yang Ming Chiao Tung University (NYCU) Sep 2020 - Aug 2022
Master of Applied Mathematics · GIMI LAB (Advisor: Prof. Wen-Wei Lin) ***GPA: 4.29 / 4.30***

National Taiwan Normal University (NTNU) Aug 2016 - Jun 2020
Bachelor of Mathematics with Educational Program ***GPA: 4.06 / 4.30***

Work Experience

Academia Sinica Jul 2022 - Present
Research Assistant in AIIULab (Advisor: Dr. Jun-Cheng Chen) *Computer Vision, Generative AI, Diffusion Model*

- Led a team of two undergrads in conducting research on the application of generative models.
- Developed the generative model for QR code generation utilizing diffusion model and designed a guided loss to facilitate successful scanning.

Appier Aug 2022 - Jun 2023
Data Analyst Intern in AiDeal Scientist Team *Machine Learning, Data Analysis, Feature Engineering*

- Developed a business model to identify user purchase tendencies and established key evaluation metrics to optimize business goals.
- Designed innovative features and feature selector to improve the CIR about **3%** in alignment with business goals.
- Produced Jupyter scripts to aid in data analysis and fulfill client data requests for the Project Manager.

National Center for Theoretical Sciences (NCTS) Jul 2022 - Aug 2022
Teaching Assistant *Computer Vision, Numerical Optimization, Scientific Computing*

- Led a group of three undergrads in conducting research on the application of geometry image processing.
- Designed a novel variational-based image denoising model and substantiated the effectiveness and convergence of its algorithm.
- Developed an image stitching algorithm achieving execution times **1.28 times** faster than Photoshop's built-in stitching algorithm.

Selected Projects

Taiwan-LLM Tutor: Large Language Models for Taiwanese Secondary Education [CODE] *Dec 2023*

- Developed Taiwanese Mandarin LLM utilizing QLoRA and instruction tuning to generate answer of GSAT questions.
- Devised Vision BERT by using RoBERTa and CLIP to conduct the multiple choice task with GSAT questions.

Multimodal Pathological Voice Classification (2023 AI CUP Golden Medal Award) [CODE] [REPORT] *Jun 2023*

- Applied FFT for frequency feature extraction and employed wavLM and wav2vec for zero-shot transfer of latent features from audio data.
- Integrated models such as Random Forest, LightGBM, and TabPFN to enhance model robustness, ultimately achieving SOTA performance.
- Utilized feature importance and SHAP interpretability tools to dissect and interpret model predictions.

Crop Image Recognition (2022 AI CUP Honorable Mention Award) [CODE] [REPORT] *Dec 2022*

- Designed data preprocessing and implemented CNN, Transformer-based models, and optimization processes to classify high-resolution crop images.
- Utilized t-SNE and correlation matrices for analyzing the predicted distribution, and leveraged Grad-CAM to visualize the model's attention.

Contour Segmentation for STAS in Lung Adenocarcinoma (2022 AI CUP Merit Award) [CODE] *Jun 2022*

- Implemented data augmentation, cross-validation, UNet with EfficientNet backbone, and TTA techniques to predict the lesion area.
- Designed a post-processing algorithm using image processing morphology techniques, resulting in a **2%** improvement in the Dice score.

Other Projects: Recommender System, Sentiment Analysis, Object Detection, Dictionary Learning, etc. [LINK]

Skills

- **Programming Language:** Python (PyTorch, TensorFlow, Scikit-learn, Numpy, Pandas), MATLAB, C, and SQL
- **Dev Tools:** Git, VS Code, Jupyter, and Vim

Honors

- AI CUP Golden Medal Award × 1, Merit Award × 1, and Honorable Mention Award × 3 *2022 - 2023*
- TWSIAM 2022 Paper Poster Contest Second Place Award *Jul 2022*
- Academia Sinica Dr. Hung-Ching Chou Scholarship *Dec 2021*