Wan-Ling Tsai

tsaiwanling99@gmail.com | 0911-127-364 | tsaiwanling | tsaiwanling.github.io

Education

Sep 2022 – Present | National Yang Ming Chiao Tung University
GPA: 4.20/4.30 | **Master Program of Mathematical Modeling and Scientific Computing, Department of Applied Mathematics**

Sep 2018 – Jun 2022 | National Yang Ming Chiao Tung University
GPA: 3.21/4.30 | **Department of Applied Mathematics**

Skills

- **Python**
  a. Handcrafted Diffusion Models / Manifold Learning
  b. Model Lightweighting/ Model Parallelization, Accelerating and Reducing the Burden of Models
  c. Feature Selection
  d. Experiment Design
- **MATLAB**
  a. Using numerical method to approximate the solution of PDE
  b. Project : Landmine game with full functionality
- **JavaScript / HTML / CSS**
  a. Project : Created an interactive webpage to visualize and analyze the Spotify Tracks dataset.

Work Experience

AI Engineer Intern 2022-2023
MTK AIDE, Taiwan

In this year, I participated in 4 projects and received 2 Contribution Awards.

1. **Weak IC prediction**
   - Implementation, technique learning: model ensemble.
   - Algorithms survey: anomaly detection.
2. **Modem aging prediction**
   - Using model ensemble, figure out the anomaly pattern.
   - Verifying the feasibility of the model
3. **Scaling factor in wireless signals prediction**
   - Data mining, figure out the data bias and assist the project team to correct the experimental design in time.
   - Solve the AI model sizing problems, reducing cycle by 20% while keeping performance.
4. **Traffic pattern in physical shared channel prediction**
   - Experimental design of online model.
   - Report project with different departments.
   - Leading rookie interns in experiments.

Selected Projects

Analysis of Generative Models: Novel Perspectives through Manifold Learning (Master's Thesis) (2024 TWSIAM)

- Conducted an in-depth exploration and theoretical analysis of Diffusion Models (e.g. DDPM, DDIM, Diffusion Schrodinger Bridge) and Manifold Learning (e.g. Diffusion Maps, ROSELAND), implemented these models from scratch.
- Applied the manifold learning technique to generative AI data, validating its effectiveness on the MNIST dataset and providing insights for improving model training.

Manifold Learning for Linear Dimensionality Reduction (2022 TWSIAM)

- Using manifold learning to analyze the structure of MNIST dataset within linear dimensionality reduction.
- Understanding which categories have low classification accuracy using LDA for linear dimensionality reduction.

Honor

- TWSIAM 2024 Paper Poster Contest First Place Award
- TWSIAM 2022 Paper Poster Contest First Place Award

Extracurricular Activities

- Chapter/Sub Chapter – TWSIAM NYCU Student Chapter
- Teaching Assistant – Required courses of Applied Mathematics (Computational Mathematics / Linear Algebra)
- Leader – Volleyball team of department
- Member – Departmental Societies (Activity Group, Academic Group)
- Vice Coordinator – Joint Orientation Camp of Three Departments