

Resume

Wei-Han, Hui (Ambrose)

Doctor of Philosophy

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Professional and Research Experiences

Michigan State University, East Lansing, MI

Research Assistant.

04.2025 - Present.

- **RNA CG model back-mapping:** Designed and implemented the model for back-mapping RNA structure from coarse-grained model (CG) to All-atom model (AA).

ACCTON Technology, Hsinchu, Taiwan

Advanced Algorithm Engineer for Generative AI and Deep Learning.

11.2023 - Present.

- **Document Assistant:** Developed and deployed a service using a Retrieval-Augmented Generation (RAG) pipeline, enabling automation, customization, and flexibility through a hybrid cloud setup (localhost and AWS).
- **LLM Platform:** Built a unified platform that integrates all LLM-based services for internal use. The platform includes tools such as an office assistant (PPT generator, Excel chart plotter, etc.), search engine, image and video generator, document summarization helper, and form assistant integrated with the ERP system.
- **LLM CI Testing:** Designed and implemented an application leveraging Large Language Models (LLMs) for continuous integration (CI) testing, including unit testing, fuzz testing, CWE scanning, and commit generation.
- **LLM Data Lake:** Connected multiple data sources to enable intelligent question answering, including automated table search and dynamic query generation to retrieve required information from databases.

Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan

Deep Learning Intern for Computer Vision.

07.2022 - 12.2022.

- Build predictive models using YOLO, and accurate to detected bee and mite (unbalanced sample).
 - Deploy on Google Cloud Platform
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Education

National Taiwan University, Taipei

Doctor of Philosophy in Artificial Intelligence center of Department of Civil Engineering.

09.2019 - 08.2023.

- **Research Areas:** Membrane protein activity mechanism, Aging and diabetic influence on collagen tissues, Warm-up effect on collagen tissues, Protein function Prediction, Lethality prediction in Osteogenesis Imperfecta, All-Atom to Coarse-Grained mapping method (case in polymer).
- **Relevant Coursework:** Bioinformatic, Physical Chemistry of Polymer, Polymer Physical in Solid State, Introduction to Machine Learning and Deep learning. Introduction to Scientific Computing and Artificial Intelligence Platform
- **Dissertation:** Predicting the Mechanical Properties and Mutational Effects of Collagen Molecules and Polymers by Combining Molecular Simulations and Machine Learning.

Publications

- GraphLOGIC: Lethality prediction of osteogenesis imperfecta on type I collagen by a mechanics-informed graph neural network - Published in **International Journal of Biological Macromolecules**, 2025.
- Structural basis and synergism of ATP and Na⁺ activation in bacterial K⁺ uptake system KtrAB - Published in **Nature Communications**, 2024.
- Effects of aging and diabetes on the deformation mechanisms and molecular structural characteristics of collagen fibrils under daily activity - Published in **International Journal of Biological Macromolecules**, 2024.
- Unraveling the molecular mechanism of collagen flexibility during physiological warmup using molecular dynamics simulation and machine learning - Published in **Computational and Structural Biotechnology Journal**, 2023.
- Encoding protein dynamic information in graph representation for functional residue identification - Published in **Cell Reports Physical Science**, 2022.

Skills

- **Physical-based simulation tools:** LAMMPS, NAMD, VMD, Vina, MDAnalysis, ProDy.
- **Programming language:** Python
- **Machine Learning framework:** Keras, PyTorch (Geometric), Scikit-learn, XGBoost, Transformers.
- **Database operation:** OpenSearch.
- **Tools operation:** Linux, Kubernetes, Docker, GitHub, Postman.
- **Cloud Platform:** AWS (lambda, bedrock).