Yuan-Tung Chou

Website | LinkedIn | GitHub | Youtube

Location: Taipei, Taiwan
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Personal Profile

As an accomplished graduate student in engineering, I possess expertise in **machine learning and deep learning**. I am highly proficient in acquiring new knowledge and am passionate about staying up-to-date with the latest AI techniques. My current research focuses on the implementation of **graph-based deep learning approaches** for structural analysis and design simulation. In addition to my academic pursuits, I have also **achieved notable success in several hackathons**, further demonstrating my aptitude for innovative problem-solving.

Awards

Best Use of Science, Global Winner (1st/5300+ Teams), 2022 NASA Space Apps Challenge Dec 2022

- Proposed an ML framework that successfully removes the noises from space data (with 77% improvement in R square) and predicts Carrington Events accurately with 95% accuracy. (link)

Honourable Mention, AEC Tech Hackathon Nov 2022

- Proposed GraFix, a graph-neural-network-based framework that fixes misalignments in 2d floor plans with 85% accuracy. (link)

Champion, Green Computing Team, TSMC x Microsoft Careerhack Jan 2022

- Proposed an ML-based energy usage policy framework which increases 25% energy efficiency in computing centers. (link)

Education

National Taiwan University Taipei, Taiwan
Master of Science in Civil Engineering, Computer-Aided Engineering Division *Sep 2021 – Present*

National Taiwan University Taipei, Taiwan
Bachelor of Science in Civil Engineering *Sep 2017 – Jun 2021*

Research

Structural Section Optimization with Graph-based Deep-Q-Network Jun 2022 – Present

- Developing an RL agent with edge embedding network and Q-learning to inductively optimize the design of sections in the structure building. *(keywords: GNN, RL, DQN)*

Nonlinear Dynamic Structural Analysis with Hierarchical Graph-based LSTM Networks Jan 2022 – Nov 2022

- Developed a hierarchical graph-LSTM to simulate the dynamic time-series responses of structures under earthquake motions. *(keywords: GNN, LSTM)*

Linear Static Structural Analysis with Deformable Graph Neural Networks Jul 2021 – Jan 2022

- Implemented a deformable-GNN where the number of message passing layers varies with geometries of structure building to simulate the structural behavior under external forces. *(keywords: GNN, structure representation learning)*

Intern

R&D Intern Jul 2020 - Aug 2020
Sinotech Engeineering Consultants *Taipei, Taiwan*

- Developed a detection system that detects the building regulations the 3d BIM models are violating with Revit API. *(keywords: C#, object-oriented programming, RevitAPI)*

Publication

• Jornal Articles

Linear Static Analysis with Graph Neural Networks
Yuan-Tung Chou, Po-Chih Kuo, Kuang-Yao Li, Wei-Tze Chang, Yin-Nan Huang, Chuin-Shan Chen
Journal of Structural Engineering 2022; 37(4). Chinese Society of Structural Engineering, 2022

• Conference Proceedings

Learning to Simulate Nonlinear Response-History Analysis for Steel Structures
Yuan-Tung Chou, Po-Chih Kuo, Kuang-Yao Li, Wei-Tze Chang, Yin-Nan Huang, Chuin-Shan Chen
46th National Conference on Theoretical and Applied Mechanics (CTAM 2022), 2022

Nonlinear Structural Analysis with Machine Learning Based on Graph Neural Network and Structural Topology
Yuan-Tung Chou, Jimmy G. Jean, Kai-Hung Chang, Wei-Tze Chang, Chuin-Shan Chen
45th National Conference on Theoretical and Applied Mechanics (CTAM 2021), 2021

Technical Skills

Python, C++, traditional machine learning models, deep learning models, GNNs, RNNs, CNNs, GANs, recommendation system, object detection, image segmentation, PyTorch, Git, AWS, Docker