Chon Hei Lo

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supercgor.github.io

Education

B.S. in Physics | Peking University | Beijing, China Sep 2020 - Present

Research Advisor: Prof. Limei Xu

Experiences

Undergraduate Researcher, Peking University | Advisor: Prof. Limei Xu Aug 2022 - Present

Machine Learning for Computational Studies of Interfacial Water Systems

- **Objectives:** to resolve the structures of interfacial water and hydrated ions from AFM images utilizing molecular dynamics simulations, first principles calculations and machine learning.
- Applying 3D object detection and domain adaptation techniques to accurately determine the spatial positions of atoms in AFM images from experiments.
- Constructed statistical algorithms utilizing GPU technology and integrated physically meaningful loss functions within machine learning models, enhancing computational efficiency and accuracy.
- Using VAE, GNN and score-based models to understand the structure near water/solid interface.

Summer Intern, University of Pennsylvania - Yale University | Advisor: Prof. Lu Lu Jun 2023 - Present

Physics Informed Active Learning for Operator Learning

- **Objectives:** using physical a priori knowledge to accelerate the convergence of neural networks, reduce computational costs, and enable the provision of more precise and reliable predictions.
- Implement Partial Differential Equations to assess data distributions, reducing the reliance on extensive data for neural network training.
- Conduct a systematic investigation into the foundational theories of active learning, with the objective of constructing a universally applicable theoretical framework.

Collaboration, Peking University | Collaborator: Dr. Chan-Pang Ng Feb 2023 - Present

Factor Analysis and Prediction of Thunderstorm Events Using Machine Learning

- **Objectives:** To excavate pertinent factors from data utilizing machine learning techniques and to employ Graph Neural Networks (GNNs) for the prediction of future thunderstorm events.
- Encode real-world data based on its physical information.
- Construct and train the Graph Neural Networks.

2020 - Present

- Website developing and Server maintenance

Research Internship, Macao SAR Economic and Technological Department Summer 2021

- Big Data Analytics

Projects

Artificial Intelligence on Graph Systems | Advisor: Prof. Bin Chen Feb 2022 - Jun 2022

- Using object-oriented programming to construct game playing AI.

Awards & Honors

Academic Excellence Scholarship, Peking University Jan 2021 - Present

Special Scholarship, Macao foundation Sep 2020 - Present

International Distributed Physics Olympiad 2020, Bronze Metal Nov 2020

American Regions Mathematics League Team Round, Bronze Metal Jun 2019

Selected Courses

Advanced Mathematics (A)	(89/100)	Methods of Mathematical Physics	(90/100)
Linear Algebra (A)	(91/100)	Modern Physics Laboratory I	(89/100)
Thermodynamics and Statistical Physics (A)	(89/100)	Seminar for Equilibrium Statistical Physics	(96/100)

Personal

Languages/Scripts	Python (numpy, pandas, PyTorch, PyTorch lightning, deep graph library, DeepXDE, etc.), LaTeX, Bash, JavaScript, C, HTML.
Programs/Tools	Mathematica, Matlab, Multisim, Ovito, OriginLab, HyperV, Linux, Excel.
Technical Skills	**Hands-on experience working with:** large datasets | machine learning algorithms | proxy server architecture | website architecture | neural network architectures (U-net, res-net, transformer, DETR, EGNN, VAE, diffusion model, score-based model) **Proficient in:** remote-developing | developing GPU-based differentiable operators. **Knowledge in the field of:** computer vision | natural language processing | reinforcement learning.