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.
- Utilizing 3D object detection and domain adaptation methods to provide highly reliable spatial positions of atoms from the AFM images obtained in experiments.
- Developed GPU-based statistical algorithms, and embedded physically-meaningful loss functions in machine learning.
- Using VAE, GNN and score-based models to predict the disordered layer below interfacial water.

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

Physics Informed Active Learning for Operator Learning

- Objectives: Leverage physical a priori knowledge to accelerate the convergence of neural networks, reduce computational costs, and enable the provision of more precise and reliable predictions.
- Employ Partial Differential Equations (PDEs) to measure data distributions, thereby diminishing the dependency of neural network training on data.
- Investigate the potential theoretical implications of various functional spaces on the performance of neural networks.

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.
- Activities include the construction and training of Graph Neural Networks.

Network Engineering | MCCA, Peking University 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

Methods of Mathematical Physics	(90/100)	Thermodynamics and Statistical Physics (A)	(89/100)
Seminar for Equilibrium Statistical Physics	(96/100)	Data Structure and Algorithm (B)	(90/100)
Advanced Mathematics (A)	(89/100)	Linear Algebra (A)	(91/100)

Personal

Languages/Scripts	Python *(numpy, pandas, PyTorch, PyTorch lightning, deep graph library, 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 | neural network architectures (U-net, Res-net, Transformer, DETR, EGNN, VAE, Diffusion model, Score-based model) | Proxy Server architecture | Website architecture. Proficient in Remote-developing | developing GPU-based differentiable operators | Knowledge in the field of computer vision | natural language processing | reinforcement learning.