Qinshuo Liu

Email: u3008680@connect.hku.hk ◇ +86 18529077863 ◇ GitHub

Education

The University of Hong Kong — Hong Kong
Phd, Statistics and Actuarial Science — 09/2021 - Present

Peking University — Beijing, China
Bachelor, Yuanpei College — 09/2017 - 07/2021

Professional Experience

DP Technology — Beijing, China
Operations and Maintenance — 09/2020 - 07/2021

- Help maintain the github of products and help with the issues in products about molecular simulation.
- Help with open source of products in community.

Papers and Working Papers

- **[ICML(2024) *accepted*, CCF-A, 1st author]** DNA-SE: Towards Deep Neural-Nets Assisted Semiparametric Estimation.
  - We develop a new DNN-based algorithm called DNA-SE that streamlines solving the integral equations and estimating the parameter of interest simultaneously.
  - Formulate the semiparametric estimation problem as a bi-level optimization problem minimizing loss functions with a "nested" structure; and solve this bi-level programming via Alternating Gradient Descent algorithms.
  - Our DNA-SE is a promising practical tool for estimating parameters in semiparametric models, outperforming traditional methods (e.g. polynomials).
  - Now we are committed to solving all the traditional second Fredholm kind integral equations with our method.
- **[NIPS(2024) *under review*, CCF-A, 1st author]** DGCformer: Deep Graph Clustering Transformer for Multivariate Time Series Forecasting.
  - We propose a method called DGCformer which confirms the utility of harnessing the combined strengths inherent in both Channel Independence and Channel Dependence strategies.
  - We combine autoencoder, graph neural network and others to deptly consolidate channels into discrete clusters.
  - Compared to the state-of-the-art methods for time series forecasting available until now, our proposed approach demonstrates superior performance.
- **[ACM MM(2024) *under review*, CCF-A]** PGformer: Proxy-Bridged Game Transformer for Multi-Person Highly Interactive Extreme Motion Prediction.
  - We propose a novel cross-query attention module to capture the cross-dependencies between the two interactive poses.
  - We propose PGformer for multi-person interactive extreme motion prediction, considering the interactions between the involved persons not only in the historical poses but also in predicting future motions.
- **[ICLR(2024) *working draft*, CCF-A, 1st author]** Are state space models effective in aggregation layers?
  - We propose a novel model that is inspired by the principles of state space modeling and show that it can be effectively used in the aggregation layers of both CNN-based and Transformer-based architectures.
  - Our aggregation layers that incorporate state space modeling techniques outperform traditional aggregation layers across a range of tasks, such as image classification and object detection, demonstrating the advantages of this approach.

Research Experience

The University of Hong Kong Hong Kong
09/2021 - Present

- Study about how to give a model on solving integral equations with Dr. Zhonghua Liu in Columbia University in U.S.A.
- Try to give a model with transformer or other sota methods on the prediction of metal protein (such as Zn^{+}) with Dr. Zhonghua Liu.
- Talk about some basic algorithm about reinforcement learning and Markov Decision Process with Prof. Guodong Li in the University of Hong Kong.
- Try to combine some sota methods such as Mask2former to use in a new dataset in multimodal learning.
- Give a transformer-based model on long time series forecasting with cluster and graph neural network.
- Try to insert the basic idea given in Mamba into aggregation layers in CNN and transformer based models.

Peking University Beijing, China
09/2019 - 10/2020

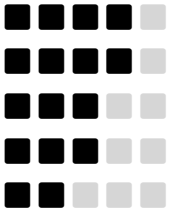
- Study with Prof. Zhi Geng in Math especially in variable correlation with consequence graph in Bayesian Network.
- Analyze COVID-19 data and model it to predict how many people will be saved from disaster because of the implementation of some prevention and control measures with Prof. Bin Dong and also study how to use ODE or PDE to derive mathematical proofs of RNN and LSTM.

Teaching (Tutorial)

The University of Hong Kong Hong Kong
STAT2601: Probability and Statistics 09/2021 - Present

Technical Skills

Python
PPT, Word, Excel
R
Linux
C++



Research Interests

- Time Series Analysis
- Computer vision
- Multimodal deep learning