Fan Nie

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Education

Shanghai Jiao Tong University Sep 2020 – Jun 2024 (Expected)
B.Eng in Computer Science and Technology (IEEE Honor Class) Shanghai, China

- GPA 93.38/100, Rank 2/127
- A+ Courses: Data Structure, Operating System, Computer Architecture, Computer Networks, and 19 others

École Polytechnique Fédérale de Lausanne(EPFL) Feb 2023 – Aug 2023
Exchange Student of Computer Science Lausanne, Switzerland

- Courses: Database System(6.0/6.0), Machine Learning(6.0/6.0), Data Visualization(6.0/6.0)

Research Experience

Uncertainty-Aware Decision Transformer Mar 2023 - Present
CoRL 2023 submission; the Co-First Author MARSLab, THU

- Present an uncertainty-aware decision transformer for stochastic driving environment which can down-weight actions that result in highly uncertain returns to enable DT to focus on learning actions that can accurately achieve target returns.
- Paper; Code; Experiment; Visualization
- Extensive experimental results demonstrate UNREST's superior performance in various driving scenarios and the power of our uncertainty estimation strategy.

Improving Generalization of GNNs with Divergence Fields Decomposition. Oct 2022 - May 2023
NeurIPS 2023 Submission; the Second Author Thinklab, SJTU

- Propose a graph diffusion model with branching-structured divergence fields to improve generalization of GNNS.
- Set up the pipeline and models; Do comparative and ablation experiments to show the model performance; Visualization of experimental results;
- Our GINN perform best in various node property prediction tasks, where training and testing distributions exhibit significant differences, with up to 27.4% improvement over state-of-the-art models.

Simplified Graph Transformers Inspired by Gradient Flows. July 2022 - Jan 2023
ICML 2023 Submission; the Fourth Author Thinklab, SJTU

- Propose simplified graph Transformers (SGFormer) as a powerful and scalable encoder for large graphs. SGFormer resorts to simple-yet-effective designs: one or two-layer feature propagation and global attention with linear complexity.
- Set up baselines; Do comparative and ablation experiments to show the model performance; Visualization of experimental results;
- Our SGFormer significantly outperforms SOTA Transformers, with 74x acceleration in terms of training time costs

GraphDE: A Generative Framework for Debiased Learning and Out-of-Distribution Detection on Graph Data. Mar 2022 - Sep 2022
full paper accepted by NeurIPS 2022; the Third Author Thinklab, SJTU

- Tackle the problems of outliers in training set and OOD samples from new data in graph data under a unified probabilistic model; Automatically identify and down-weight outliers in the training stage and induce a OOD detector from the model.
- Set up baselines; Conduct 15+ experiments on different datasets to show the model performance and robustness; Visualization of experimental results; Draft and finalize the paper.
- Our model GraphDE achieves consistent performance improvements over the baselines. For example, in the OOD detection task, it outperforms the strongest baseline by 9.31% on MNIST-75sp.

Internship Experience

Qizhi Institute. July 2023 – Present
Research Intern Shanghai, China

- Supervised by Prof. Hang Zhao.
- Research on multimodal learning and autonomous driving.

Biomap, Inc. Jun 2022 – Dec 2022
Algorithm R&D Intern Beijing, China

- Set up the DeepCellState baseline and different types of Attention Free models to predict changes in gene expression levels after drug interference using PyTorch, and test their performance on our datasets.
- Design and implement data binning, resulting in smaller losses.
- Finetune the pretrained model and raise the f scores.

Project Experience

Coffee Kingdom Visualization. Apr 2023 - June 2023
Course Project for Data Visualization fannie1208/project-2023-kingdom_of_kaffa

- Design and implement an Interactive visualization website to assist those coffee lovers in finding the perfect package of freshly roasted coffee.

Graph Neural Networks for Scalable Combinatorial Optimization. Mar 2023 - June 2023
Research Project in LIONS, EPFL

- Speed up the decoding process of solving CO problems with a GNN by directly sampling from the learned probabilities and employ a STE to guide the network in making accurate discrete decisions.
- Code; Experiment; Paper Writing

PLI-Python-based-Lambda-Interpreter Dec 2022 - Jan 2023
Course Project for Programming Language FKCSP/PLI-Python-based-Lambda-Interpreter

- Design and implement a lambda interpreter based on Python that supports arithmetic operations, size comparisons, conditional branches, and recursive functions.

Skills

Programming Languages: Python, C++, JavaScript, HTML, CSS
Tech Skills: MySQL, PyTorch, Data Visualization, Web Development, Web Crawler

Extracurricular Activities

Youth Volunteer Team Mar 2021 - Dec 2022
Minister of Planning SJTU, Shanghai

- Plan and organize various volunteer activities such as Shanghai Marathon volunteers, etc.; Write planning cases and liaise with different departments.