Mingyang Wu

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Education

Tufts University **Sep. 2022 – June 2024**
Master of Science in Data Science, GPA: 3.95/4.00 *Medford, Massachusetts*
Core Course: Computer Vision(A+), Probabilistic Systems Analysis(A+)

Central University of Finance and Economics **Sep. 2017 – June 2021**
Bachelor of Arts in Financial Journalism, GPA: 3.71/4.00 *Beijing, China*

Research Interest

- generative model(diffusion model)
- graph generation
- graph learning

Publication

- **M Wu**, X Chen, L Liu *"LCGG: likelihood-comparison-graph-generation"* Ongoing
- **M Wu***, X Chen*, L Liu *"EDGE++: Improved Training and Sampling of EDGE"* accepted by NeurIPS 2023 GLFrontiers and Diffusion Models Workshop paper can be found here.

Research Experience

Tufts ML Research Group, Tufts University **March 2023 – Present**
Advisor: Prof. Liping Liu *Medford, Massachusetts*

- Led the development of a novel approach for generative tasks on large graphs, building upon the foundational work of the EDGE model.
- Identified and addressed a key inconsistency between the denoising and diffusion processes, enhancing the model's computational efficiency.
- Introduced a two-stage processing pipeline, optimizing the noise schedule principle focused on nodes, and implemented a binary search solution for parameter tuning.
- Formulated a normalization term for reweighing node and edge distribution, ensuring accurate graph generation at every timestep and reducing memory usage by over **40**% during the training process.

Graduate Directed Study **August 2023 – Present**
Advisor: Prof. Liping Liu *Medford, Massachusetts*

- Developed advanced techniques for the evaluation and comparison of permutation-based and permutation-agnostic graph generation models, addressing a current gap in the domain.
- Pioneered a novel method leveraging standard likelihood estimation to benchmark different graph generation models.
- Formulated and established mathematical representations and equations for computing likelihoods in both permutation-invariant and permutation-based models.

Work Experience

Beijing Aerospace Willfor Information Technology Co.,Ltd **October 2021 – March 2022**
Software Engineer Intern *Beijing, China*

- Developed and implemented a comprehensive data collection and preprocessing pipeline, beginning with the creation of web scraping plugins to extract targeted features from fraudulent websites across **10** distinct categories for analysis purposes. Enhanced data quality and accuracy byemploying advanced techniques, such as tokenization, lemmatization, customized stop words lists, and word embedding.
- Conducted in-depth analysis of extracted data to uncover patterns and characteristics of fraudulent websites, which informed subsequent investigations.
- Employed machine learning algorithms,such as Logistic Regression, Multilayer Perceptron, and Random Forest to analyze collected data, tuning multiple hyperparameters(e.g. relu, logistic, and tanh activation functions) and conducting cross-validation tests to optimize modeling accuracy.
- Assessed model stability by visualizing the standard deviation of train and test data for each model, achieving a final optimized model with **83.7**% accuracy and a **89.1**% AUROC per category.

Technical Skills

Languages: Python, PyTorch, HTML/CSS, SQL
Developer Tools: VS Code, Google Cloud Platform
Technologies/Frameworks: Linux, GitHub