



Fraud detection in large-scale dynamic graph using graph neural network (GNN)

Master Thesis/Semester Project Proposal

Problem Description

Systems using graph neural networks (GNN) to understand the local community structures and user behaviors have gained tremendous leap in the recent development of industrial applications. Processing the graph structured data using heterogeneous [2] and dynamic [3] graphs provides further opportunities to capture interesting patterns that would be otherwise missed by homogeneous/static graphs.

We are looking for an ETH master student to support one project on **fraud detection [1] using large-scale graph structured data**. The candidate is expected to have the following skill set:

- a general understanding towards neural network architecture and experiences with GNN models
- proficiency with Python, tensorflow and pytorch
- (optional) experiences with multi-task learning would be preferable

We offer

- an opportunity to work with industry scale data
- a close project coaching from industrial and academic supervisors
- an opportunity to publish in top conference venues

Expected start time: ASAP

If you are interested in this project and want to discuss further, please contact Susie Xi Rao (raox@inf.ethz.ch) and Dr. Shuai Zhang (shuazhang@inf.ethz.ch). The proposed Master Thesis will be supervised by Prof. Dr. Ce Zhang.

References

- [1] Graph-based Fraud Detection Papers and Resources, <https://github.com/safe-graph/graph-fraud-detection-papers>.
- [2] Carl Yang, Yuxin Xiao, Yu Zhang, Yizhou Sun, and Jiawei Han. 2020. Heterogeneous Network Representation Learning: Survey, Benchmark, Evaluation, and Beyond. arXiv preprint arXiv:2004.00216 (2020).
- [3] Sankar, Aravind, et al. "DySAT: Deep Neural Representation Learning on Dynamic Graphs via Self-Attention Networks." *Proceedings of the 13th International Conference on Web Search and Data Mining*. 2020.