(Joy) Jingyi Xu

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Education

PhD in Network Science, with a focus on Computer Science **September 2019 - Present**

Northeastern University, Boston, US (GPA: 3.815)

Current Research Focus: Network Robustness, particularly in graph embedding scope

Research Interests: Networks, Game theory aspects on Networks, Machine Learning

Masters in Computer Science **June 2018**

University of California, Los Angeles, US (GPA: 3.59)

Research Thesis: Applying Constraints on Neural Network

Personal Website: https://joyxu123.github.io/

Bachelor of Science in Actuarial Mathematics, minor in Computer Science **April 2014**

University of Michigan, Ann Arbor, US (GPA: 3.779)

Research Experience

Graph Embedding Methods Comparison: (on-going research project)

- Measure consensus between different graph embedding methods from three general types of graph embedding methods: random walk, deep embedding, matrix factorization. Determine what different graph embedding methods perform well under what type of networks structure.
- Presented the poster "Comparing Network Embedding Methods Based on Primary Design Choice" on **Network Science Conference 2020.**
- Our work shows that SDNE and PCA are highly correlated.

Adversarial Attack on Time-series Network: (summer research internship with IBM 2020)

- Construct an adversarial attack on networks with time-series data.
  Bridge the gap between adversarial attack on static graph with robustness research on prediction algorithms on time-series network.

Applying Constraints on Neural Network: (published in **ICML 2018**; won the **Best Paper Nomination** for Learning with Limited Labeled Data Workshop **NIPS 2017** as one of the 6 papers nominated out of 46 accepted papers)

- Designs a novel loss function-semantic loss function as a regularizer of original loss function, to capture tasks' constraints.
- On semi-supervised learning: Our method increases the accuracy from the baseline model by 20% on 100 labeled examples, reaching an accuracy of 98.38% (lose to state-of-art by 0.5%), under permutation invariant environment. On CIFAR-10, our model reaches 81.79% using 4000 labeled example with a baseline CNN neural network(reaching 77.13% without the constraints we add).
- On problems with complicated constraints: Our model reports significant accuracy improvements on problems that previously was deemed unsolvable by neural network like preference learning and path searching.

Algorithm Research (Individual In-class Research Project, spring 2018)

- Models the ride-sharing problem of Uber and Lyft into Mutually Exclusive Set Cover problem
- First changes the existing state-of-art approximation algorithm to optimal algorithm and apply on the Mutually Exclusive Set Cover problem and improves the algorithm by including possible heuristics.
- Reduce number of computations by 95% on 100 sets with element size 50.

Scholarship Awards

1. Wolfson Scholarship 2012 (Actuarial Scholarship to juniors in College), sponsored by UM Math Department
2. Singapore Middle School-Based Full Scholarship 2007-2010, sponsored by Singapore Chinese Chamber of Commerce