Towards Societal Impact of AI

Chuxu Zhang

Department of Computer Science, Brandeis University, USA

Artificial intelligence (AI) and Machine Learning (ML) have shown great success in many areas such as computer vision, natural language processing, and knowledge discovery. However, AI research to deliver social benefits and impacts is less explored while imminent needed. Guided by the United Nations' Sustainable Development Goals[1], my research involves the development of advanced AI techniques, in particular Deep Graph Learning (DGL), to address the grand societal challenges and further apply them to various social good applications for improving our society and people's daily life, namely DGL for Social Good (DGL4SG). Achieving the goal is not easy since challenges come from the increasing complexity of many factors including problems, data, and techniques, which require long-term and concentrated effort. DGL presents a good opportunity to build better solutions and tools due to its strong capability in learning and inferring graph data which is ideal for modeling many real-world social good systems. Fortunately, I have been working on DGL with continued contributions and impacts since my graduate study. The special research experience lifts me up to a unique position for conducting research that intersects AI, DGL, and social good (as shown in Figure 1), and pushing the field of DGL4SG forward.

Contributions. Within the broad areas of AI, my research work and contributions are summarized as follows:

- I work on the core research of DGL, with a focus on models, resource efficiency, and trustworthiness. Specifically, I have made some contributions to network embedding and graph neural network models, graph few-shot learning, graph self-supervised learning, graph neural network pruning and distillation, interpretable graph learning, and robust graph learning.
- The DGL research lays the foundation for my applied research of AI for social good in various domains, mainly in public health, cybersecurity, and interdisciplinary studies. To be specific, I have made considerable contributions to applying AI and DGL to combat the opioid crisis, enhance social and information infrastructure resilience, and facilitate interdisciplinary applications, e.g., food analysis and recommendation.

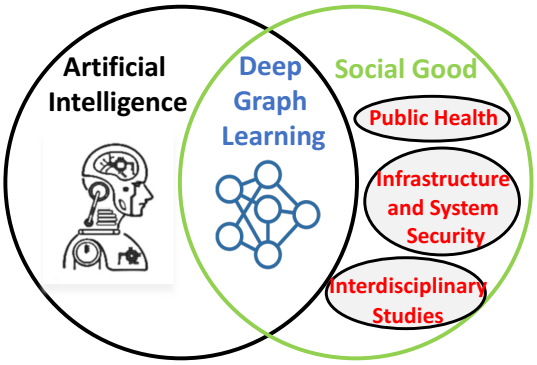

Figure 1: Overview of my research: advancing AI and deep graph learning for social good.

Impacts. My previous research has achieved considerable impacts in AI/ML/data science research communities:

- I have published more than 60 papers in major conferences of data science (e.g., KDD), machine learning (e.g., NeurIPS), and artificial intelligence (e.g., AAAI). As of 12/2022, my google scholar citation is more than 2,700[2]. My recent research studies are highlighted in the tutorial sessions of KDD'22, KDD'21, and KDD'20. I am also selected for New Faculty Highlights at AAAI'23.
- My research won several best paper (candidate) awards in major conferences including CIKM'21. Some of my first-author papers (e.g., HetGNN at KDD'19 and MSCRED at AAAI'19) are selected as the most influential papers by Google Scholar. In addition, my research has been recognized by funding agencies. I have received some grants including the NSF D-ISN grant (2022) and the Brandeis Provost Research grant (2021).

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[1]https://sdgs.un.org/goals

[2]https://scholar.google.com/citations?hl=en&user=ZbZ0l0oAAAAJ