Data Science Seminar Series

In Collaboration with
The Department of Data Science

Responsible Graph Machine Learning Under a Fairness Lens

Hosted by Hai Pha

Yushun Dong

Ph.D. Candidate at the University of Virginia

Date:	**Monday, February 26, 2024**
Time:	**2:30 PM - 3:30 PM (Coffee served at 2:15 PM)**
Location:	**GITC Building Room 3600 (3rd floor Seminar Room)**
Web Link:	**Zoom Meeting Link**

Graph learning algorithms have been increasingly deployed in a plethora of real-world applications, such as epidemic analysis, healthcare, and financial analysis. Nevertheless, there has been a rise in societal concerns about the algorithmic bias that these algorithms may exhibit. In certain high-stakes applications of graph learning algorithms, such as healthcare and criminal justice, decisions heavily rely on the algorithmic output predictions, and life-changing decisions could be made for the involved individuals. Therefore, the potential algorithmic bias could lead to serious consequences, e.g., marginalizing those underrepresented demographic subgroups and hurting the benefit of disadvantaged communities. As such, there is an urgent need to develop responsible graph machine learning algorithms to facilitate fairness-aware predictions. However, properly handling such a task is non-trivial, and a series of challenges remain to be solved. In this talk, I will present my exploration to address the fundamental challenges in model explanation and bias mitigation for fair graph learning algorithms. First, I will focus on group fairness and explore how each node in the graph data influences the bias level during the optimization of graph learning models. Second, I will move on to individual fairness and discuss how to improve the fairness level of common graph learning algorithms. In the end, I will conclude the talk with future research directions of developing responsible graph machine learning algorithms and deploying them to benefit social good in real-world applications.

Yushun Dong is a final-year Ph.D. candidate under the supervision of Prof. Jundong Li in the Department of Electrical and Computer Engineering at the University of Virginia. He received his B.S. degree in Telecommunications from Beijing University of Posts and Telecommunications in 2019. His research interest lies in developing responsible graph learning algorithms to facilitate inclusive decision-making, and his research works span multiple high-impact areas such as deep learning explainability, algorithmic bias mitigation, safety, and applications of responsible learning algorithms including healthcare and public policy. These research works have been published in high-impact venues including SIGKDD, WWW, and AAAI. He is also the first author of the open-source Python library PyGDebias, which aims to help practitioners mitigate bias for the commonly used graph learning algorithms in applications. He is the recipient of multiple prestigious awards, such as the Louis T. Rader Graduate Research Award, Endowed Fellowship, and Best Poster (Runner-Up) at the Doctoral Forum of SDM 2022.