Department of Data Science

Data Science Seminar Series

Graph Structure as A Double-Edged Sword in Machine Learning

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Date: Thursday, February 17th, 2022
Time: 11:00 AM – 12:00 PM EST
Location: Zoom Virtual Room
Web Link: [Zoom Meeting Room Link](#)

Graph structures describing relationships and interactions among entities are everywhere, ranging from chemical molecule structures in the microworld, societal networks in daily life to the Internet to defender-adversary interactions in national security. The ubiquity of such a graph-structured description of our world calls for effective and trustworthy methods that make use of and learn to understand information represented in this structured form. On one hand, graph structure brings relational inductive bias to facilitate learning algorithms; on the other hand, such structure could be used in an undesired way threatening the trustworthiness of machine learning.

In this talk, I will introduce my work on computational questions pertaining to the double-edged role of graph structure in machine learning. In particular, I will mainly illustrate the opportunities and the trustworthiness issues through three threads of my research: 1) how to utilize graph structure to enhance machine learning especially when label information is limited; 2) how to mitigate societal discrimination in predictions resulting from structural bias. I will demonstrate my studies on these questions lying at the intersection of machine learning and network science.

Lu Lin is a Ph.D. candidate in the Computer Science Department at the University of Virginia (UVa), advised by Professor Hongning Wang. Before coming to UVa, she obtained her B.S. and M.S. degree in Computer Science Department from Beihang University. Her research interests include artificial intelligence, data mining and applied machine learning on graph-structured data. She focuses on utilizing graph structure to advance machine learning in a trustworthy and responsible manner. Her research has been published at high-impact venues (e.g., KDD, WWW, AISTATS, WSDM, TKDE).