BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL

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Department of Medicine
Channing Division of Network Medicine

Channing Methods Seminar
February 7 (Tuesday), 2023, 11AM (ET)

MCP 5th-floor large conference room
https://us02web.zoom.us/j/579497999?pwd=cHNIWHMzWUIFUUVJTG1EeVJmY05aQT09
Meeting ID: 579 497 999
Passcode: 844168

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Graph AI to Enable Precision Medicine

Abstract: Graph representation learning infuses knowledge, geometry, and structure into machine learning models. First, I will introduce Shepherd, a graph neural network for diagnosing patients with rare genetic diseases. Diagnostic delay in rare diseases is pervasive and can lead to numerous problems. Shepherd uses knowledge-guided geometric deep learning to gather information from different parts of a knowledge graph and logically connect the patient's clinico-genetic information with the part of the knowledge graph most relevant to diagnosis. Independent evaluations on two real-world cohorts show that Shepherd can accurately identify causal disease genes, find patients with similar genetic and phenotypic features, and provide interpretable characterizations of novel diseases. Second, I will describe the critical role of geometric deep learning in therapeutic science. I will introduce Therapeutics Data Commons (https://tdcommons.ai), an initiative to access and evaluate AI capability across therapeutic modalities and stages of drug discovery. The Commons supports the development of machine learning methods, with a strong bent towards developing the foundations for which methods are most suitable for drug discovery and why.

Bio: Marinka Zitnik (https://zitniklab.hms.harvard.edu) is an Assistant Professor at Harvard with appointments in the Department of Biomedical Informatics, Broad Institute of MIT and Harvard, and Harvard Data Science. Dr. Zitnik has published extensively in top ML venues and scientific journals. Dr. Zitnik is an ELLIS Scholar in the European Laboratory for Learning and Intelligent Systems (ELLIS) Society and a member of the Science Working Group at NASA Space Biology. Her research won paper and research awards from the International Society for Computational Biology, Bayer Early Excellence in Science, Amazon Faculty Research, Roche Alliance with Distinguished Scientists, Rising Star Award in Electrical Engineering and Computer Science, and Next Generation in Biomedicine Recognition, being the only young scientist with such recognition in both EECS and Biomedicine. Dr. Zitnik co-founded Therapeutics Data Commons and leads the AI4Science initiative.

Hosted by Yang-Yu Liu