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Inverse Problem Seminar

Leveraging Knowledge Graphs for Mining Online Social Networks: Applications to COVID-19, QAnon, and Hate Speech

Prof. Junyuan Lin
Loyola Marymount University

Abstract: The application of knowledge graphs has surged across disciplines, offering a powerful tool for analyzing complex data. This presentation explores the use of knowledge graphs to mine online social networks, focusing on COVID-19, QAnon, and hate speech. First, we construct a knowledge graph from COVID-19 related tweets in Los Angeles, integrating policy announcements and disease statistics. Using natural language processing and change point analysis, we uncover connections between public sentiment and real-world events. Second, we apply knowledge graphs to tweets from a far-right Twitter network discussing QAnon, revealing fragmented communities around key events like the January 6th Capitol riots. Lastly, we examine the relationship between online discourse and physical hate crimes against Black and LGBTQ+ communities. By connecting tweets, users, topics, and hate crimes, our analysis highlights the need to monitor hate speech to prevent violence. This presentation demonstrates the versatility of knowledge graphs in providing insights into public sentiment and behavior.

Bio: Dr. Junyuan Lin is an Assistant Professor of Mathematics, Statistics and Data Science at Loyola Marymount University. Her research interests include spectral graph theory and algorithms, fast and scalable solvers for large-scale sparse linear systems, and adaptive numerical solvers for graph Laplacian systems. Dr. Lin also works on machine learning problems using graph algorithms with applications to protein-protein interaction networks, online social networks, and user recommendation systems. Her research team has won the 1st place of the DREAM Disease Module Identification challenge hosted by IBM Research and National Institutes of Health, and been invited to publish their findings on Nature Methods.

Date: May 22, 2024 (Wednesday) 12:30 PM (Hong Kong Time)
Zoom Link: <https://cuhk.zoom.us/j/96974651064>
Meeting ID: 969 7465 1064
Time: 12:30 pm (Hong King Time)

All are Welcome