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WHEN SOCIAL SCIENCE MEETS COMPUTER SCIENCE...

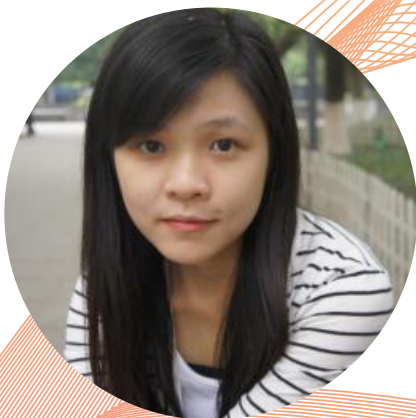**Webinar of Computational Social Science Laboratory (CSSL@CUHK)**

Comparing Modularity Scores Across Different Social Networks: Cautions, Illustrations, and Suggestions

26 August 2025 (Tuesday), 09:30 - 11:00 (UTC+8, HKT)

Abstract

In the thriving field of network studies, there has been a recently emerging practice of comparing the optimal modularity scores across different social networks to evaluate the variation of network-module-related substantive concepts, such as the levels of consensus, polarization, or community boundary rigidity. Although the rationale for this practice is comprehensible, we caution that it suffers from various conceptual and empirical issues. Conceptually, modularity scores may misalign with the substantive concepts in which social scientists are interested. Empirically, the estimated optimal modularity scores across social networks are highly sensitive to the algorithms employed and various network characteristics that are irrelevant to those substantive concepts, hence biasing the comparison results. We illustrate these conceptual and analytical problems with toy examples and systematic simulations. We demonstrate the practical significance of these lessons by replicating an empirical study that examines the temporal trend of modularity scores for job mobility networks to evaluate the evolution of mobility rigidity in the US labor market. We conclude with a summary of these lessons and offer practical suggestions for future applications of modularity comparison.

Biography

Prof. Ling Zhu is an Assistant Professor of Sociology, the Co-director of the Computational Social Sciences Laboratory, and the Associate Director of the Center for Population Research at the Chinese University of Hong Kong. Her overarching research interests consist of two substantive topics and one methodological theme: (1) state governance in authoritarian regimes through organizational and institutional perspectives, (2) mechanisms of reproducing economic inequality, gender segregation, and family advantages/disadvantages in China and in the United States, and (3) understanding misuses of causal inference methodology. The substantive studies are unified by a sociological interest in understanding how political and social institutions work together to shape social structures and are often built on newly available big data and state-of-the-art data analytics for causal inference, network analysis, and machine learning techniques.

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