

Research on Risk Relationship Network Mining of Green Building Projects Based on Bayesian Network Structure Learning

Xue-mei Huang^{1,2} and Ding-xuan Huang^{3,*}

¹Chongqing Planning & Design Institute, Longshan Avenue, Longshan Street, Chongqing, 401120, China

²Key Laboratory of Monitoring, Evaluation and Early Warning of Territorial Spatial Planning Implementation, Ministry of Natural Resources, Longshan Avenue, Longshan Street, Chongqing, 401120, China

³School of Management, Chongqing University of Technology, 69 Hongguang Avenue, Chongqing, 400054, China

*Email: huangdingxuan@cqut.edu.cn (D. X. Huang)

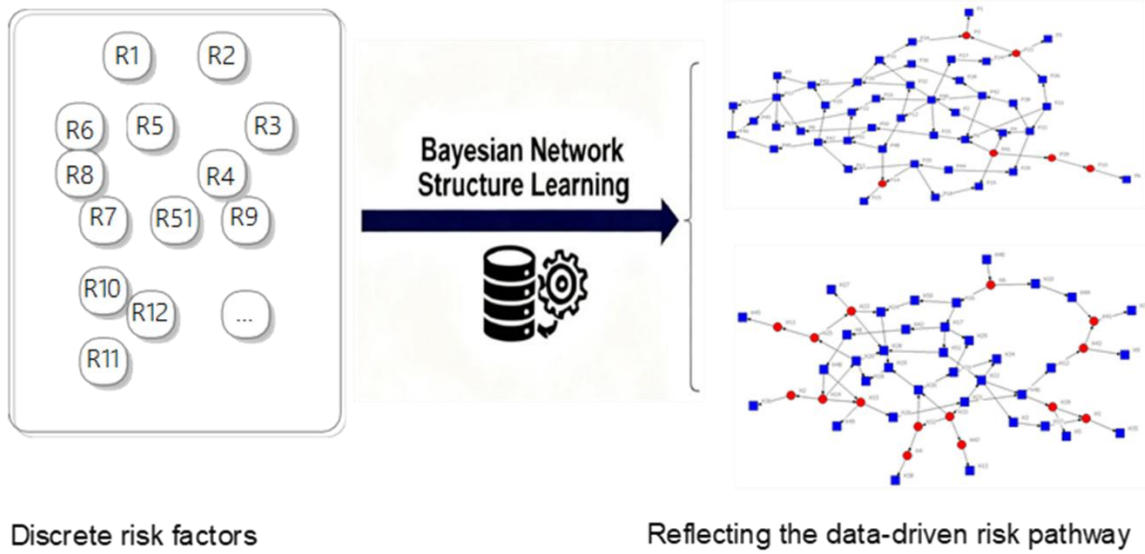
Received: 22 July 2025; Revised: 12 December 2025; Accepted: 22 December 2025

Type: Research article.

Abstract

Complex risk interactions critically impact project sustainability, yet objectively identifying directed-risk links remains insufficient. In this paper, we propose a data-driven method for objectively mining directed risk- occurrence network and directed risk-harm network in projects and test its effectiveness using survey data from green building (GB) projects in China (Typical GB such as the headquarters office building of China Construction Third Engineering Bureau). This approach aims to identify the directed networks and analyze the network traits, while also exploring the significance of these relationships. After conducting a literature review, we identified the risk factors throughout the entire life cycle of GB projects. We then used the Bayesian network structure learning method to mine the two types of directed risk networks. Using the social network analysis software, we extracted the overall indicators, structural holes, and brokerage roles of the two directed risk networks, as well as the network relationship tests. We found that the two types of directed networks differed significantly in terms of influence, structural holes, and brokerage roles. Additionally, the relationship test confirms that there is a significant relationship between the two types of directed networks. These findings can provide meaningful insights for project managers in GB projects management.

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Discrete risk factors

Reflecting the data-driven risk pathway

Innovative Description: Developed data-driven directed risk network mining for green building risk analysis with proven effectiveness.