

# Exploiting Anomalous Structural Nodes in Dynamic Social Networks

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As a long-lasting challenge in dynamic social networks, anomaly analysis research has attracted much attention. Unfortunately, existing methods focus on the macro representation of dynamic social networks and fail to analyze the micro-level nodes. Therefore, this research proposes a multiple-neighbor fluctuation method to exploit anomalous structural nodes in dynamic social networks. Our method proposes a new multiple-neighbor similarity index by incorporating extensional similarity indices, which introduces observation nodes and characterizes the structural similarities of nodes within multiple-neighbor ranges. Subsequently, our method maximally reflects the structural change of each node, using a new superposition similarity fluctuation index from the perspective of diverse multiple-neighbor similarities. As a result, our method not only identifies anomalous structural nodes by detecting the anomalous structural changes of nodes, but also evaluates their anomalous degrees by quantifying these changes. Results obtained by comparing with state-of-the-art methods via extensive experiments show that our method can accurately identify anomalous structural nodes and evaluate their anomalous degrees well.

CCS Concepts: • Information systems → Data mining; • Human-centered computing → Social networks; • Applied computing → Sociology;

**Additional Keywords and Phrases:** Anomalous structural node, dynamic social network, structural similarity

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