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Explainable self-healing for the discovery and recovery of weak nodes in complicated networks

Communication Info

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Abstract

Autonomous recovery from node failures is made possible by self-healing networks, however conventional methods are difficult to understand because they simply offer aggregate recovery measures without revealing internal dynamics[1].

This work presents an explainable self-healing mechanism with a simplified pipeline that improves transparency through the identification of susceptible nodes, the diagnosis of failure causes, and the explanation of algorithmic remedies [2]. The pipeline integrates network centrality metrics to adapt topology exchange ranges followed by simulation-driven event logging and rule-based explanation modules that produce concise, human-readable summaries of losses and recovery actions [3]. Experiments on various network topologies, including scalability testing and realistic failure situations, validate the mechanism's effectiveness by showcasing its higher recovery rates and actionable insights.

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