

Community Detection on Dynamic Graphs with Edge Local Differential Privacy

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Abstract. A significant amount of data is generated daily in today's networked systems. These data may be represented as graphs, where the nodes generally represent persons or devices and the edges represent the connections between them. Almost all networks undergo a gradual state change over time as new nodes and edges are added or removed as the system develops. As a result, dynamic graph models are more suitable for analyzing such networks than static graphs, and protective measures must be taken for the privacy preservation. In this research, we obtain a dynamic stochastic block model with an edge differentially private version. We demonstrate empirically that the extra privacy assurances effectively retain the trends in the dynamic stochastic block model derived from the original data.

Keywords: Local Differential Privacy, Dynamic Stochastic Block Model, Dynamic Graph, Social Network, Edge privacy

References