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Identity Protection in Sequential Releases of Dynamic Networks

Abstract:

Social networks model the social activities between individuals, which change as time goes by. In light of useful information from such dynamic networks, there is a continuous demand for privacy-preservingdata sharing with analyzers, collaborators or customers. In this paper, we address the privacy risks of identity disclosures in sequential releases of a dynamic network. To prevent privacy breaches, we proposed novel k^w-structural diversity anonymity, where k is an appreciated privacy level and w is a time period that an adversary can monitor a victim to collect the attack knowledge. We also present a heuristic algorithm for generating releases satisfying k^w-structural diversity anonymity so that the adversary cannot utilize his knowledge to reidentify the victim and take advantages. The evaluations on both real and synthetic data sets show that the proposed algorithm can retain much of the characteristics of the networks while confirming the privacy protection.