

On Differentially Private Counting on Trees

Friday, July 14, 2023 11:45 AM (20 minutes)

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Abstract: We study the problem of performing counting queries at different levels in hierarchical structures while preserving individuals' privacy. Motivated by applications, we propose a new error measure for this problem by considering a combination of multiplicative and additive approximation to the query results. We examine known mechanisms in differential privacy (DP) and prove their optimality, under this measure, in the pure-DP setting. In the approximate-DP setting, we design new algorithms achieving significant improvements over known ones.

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Session Classification: Track A-3