ABSTRACT

Differential Privacy is a very popular topic in computer science and statistics, which aims to implement various data analysis tasks while preserving information content. In this thesis, I rigorously introduce the fundamentals of differential privacy in different perspectives. The ranking problems, especially the top-$k$ problem under privacy settings are emphasized with different solutions. A fast, low-distortion and oneshot differentially private primitive for top-$k$ problem is introduced with rigorous proof. The applications of differentially private ranking problems use both $k$-peeling and oneshot mechanism, and experiments in both synthetic and real data examples are implemented with discussions.