The Hong Kong Polytechnic University
Department of Applied Mathematics

Seminar

Statistical inference using differentially private bi-degree sequence and synthetic directed graphs

by

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Abstract

Although a lot of approaches are developed to release network data with a rigorous differentially privacy guarantee, how to valid statistical inference (in particular for asymptotic analysis) using released data in many network models is still unknown or not properly explored. In this talk, we will present the method to release the bi-degree sequence of a directed graph using a discrete Laplace mechanism and propose an efficient algorithm for finding a maximum likelihood estimate of the bi-degree sequence, which is equivalent to projecting the noisy bi-degree sequence on the set of all graphical bi-degree sequences with the L1 distance. Along the way, our algorithm also outputs a synthetic directed graph. By using the outputs, we present a differentially private estimator of the parameters in the p0 model. We show that the estimator is asymptotically consistent and normally distributed, whose rate of convergence is the same as as the non-private estimator.

Date :   09 August, 2017 (Wednesday)
Time :   11:00a.m. – 12:00noon
Venue : TU801, The Hong Kong Polytechnic University

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