THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PhD Student Seminar

Differentially Private Confidence Interval for Extrema of Parameters

By

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Abstract

We aim to construct a valid and efficient confidence interval for the extrema of parameters under privacy protection. The usual statistical inference on the extrema of parameters often suffers from the selection bias issue, and the problem becomes more acute, as in many application scenarios of extrema parameters, we often need to protect the privacy of the data. In our work, we focus on the exponential family of distributions and propose a privatized parametric bootstrap method to address selection bias in the extrema of parameters problem under the scheme of differential privacy. While the usual privatized parametric bootstrap does not address selection bias appropriately, we prove that with a privatized bias correction term, the proposed parametric bootstrap method can lead to a valid and efficient confidence interval for the extrema of parameters. We illustrate the proposed method with the Gaussian case and regression case and demonstrate the advantages of the proposed method via numerical experiments and real data example.

Date	**:**	**8 May 2023 (Monday)**
Time	**:**	**5:00 pm**
Venue	**:**	**Room 4472 (Lifts 25/26)**
Zoom	**:**	https://hkust.zoom.us/j/7978853424 **(Passcode: 123456)**

All are Welcome!