



# The Hong Kong Polytechnic University Department of Applied Mathematics

## **Colloquium Series on Young Scholars in Optimization and Data Science**

## The cost of privacy in generalized linear models: algorithms and optimal rate of convergence

### By

## Prof. Linjun ZHANG Rutgers University

#### Abstract

In this talk, we introduce differentially private algorithms for parameter estimation in both lowdimensional and high-dimensional sparse generalized linear models (GLMs) by constructing private versions of projected gradient descent. We show that the proposed algorithms are nearly rate-optimal by characterizing their statistical performance and establishing privacy-constrained minimax lower bounds for GLMs. The lower bounds are obtained via a novel technique based on Stein's Lemma that generalizes the tracing attack technique for privacy-constrained lower bounds. This lower bound argument can be of independent interest as it applies to general parametric models. Simulated and real data experiments are conducted to demonstrate the numerical performance of our algorithms.



Date: 15 April 2022 (Friday) Time: 9:00-10:00 (Hong Kong Standard Time GMT +8) Venue: Online Talk via Zoom (Meeting ID: 957 8746 6470) Speaker: Prof. Linjun Zhang, Rutgers University Host: Dr. Yancheng Yuan, The Hong Kong Polytechnic University Click to join: https://polyu.zoom.us/j/95787466470?pwd=cWFtOXpLNW1sWmhOZ0gyK1BEWXN0UT09

\* \* \* ALL ARE WELCOME \* \* \*

For enrolment, please send your name and email to wai-yan.moon@polyu.edu.hk on or before 14 April 2022