

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

**Seminar
On robustness and local differential privacy**

By

**Dr. Yi YU
University of Warwick**

Abstract

It is of soaring demand to develop statistical analysis tools that are robust against contamination as well as preserving individual data owners' privacy. In spite of the fact that both topics host a rich body of literature, to the best of our knowledge, we are the first to systematically study the connections between the optimality under Huber's contamination model and the local differential privacy (LDP) constraints. In this paper, we start with a general minimax lower bound result, which disentangles the costs of being robust against Huber's contamination and preserving LDP. We further study three concrete examples: a two-point testing problem, a potentially-diverging mean estimation problem and a nonparametric density estimation problem. For each problem, we demonstrate procedures that are optimal in the presence of both contamination and LDP constraints, comment on the connections with the state-of-the-art methods that are only studied under either contamination or privacy constraints, and unveil the connections between robustness and LDP via partially answering whether LDP procedures are robust and whether robust procedures can be efficiently privatised. Overall, our work showcases a promising prospect of joint study for robustness and local differential privacy (<https://arxiv.org/abs/2201.00751>).



Date: 10 February 2022 (Thursday)

Time: 16:45-17:30 (Hong Kong Standard Time GMT +8)

Venue: Online Talk via Zoom (Meeting ID: 922 9682 1648)

Speaker: Dr. Yu Yi, University of Warwick

Host: Dr. Binyan Jiang and Dr. Ting Li, The Hong Kong Polytechnic University [Click to join \(Zoom\)](#)

Click to join:

<https://polyu.zoom.us/j/92296821648?pwd=ZGhWblJrSjlySE41ZWRHMu5mRG8yUT09>

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

For enrolment, please send your name and email to wai-yan.moon@polyu.edu.hk on or before 9 February 2022