



**The Hong Kong University of Science & Technology**

**Department of Mathematics**

**PhD Student Seminar**

**Robust Estimation via GANs**

**by**

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**Abstract**

Robust scatter estimation is a fundamental task in statistics. The recent discovery on the connection between robust estimation and generative adversarial nets (GANs) by suggests that it is possible to compute depth-like robust estimators using similar techniques that optimize GANs. In this paper, we introduce a general learning via classification framework based on the notion of proper scoring rules. This framework allows us to understand both matrix depth function and various GANs through the lens of variational approximations of f-divergences induced by proper scoring rules. We then propose a new class of robust scatter estimators in this framework by carefully constructing discriminators with appropriate neural network structures. These estimators are proved to achieve the minimax rate of scatter estimation under Huber's contamination model. Our numerical results demonstrate its good performance under various settings against competitors in the literature.

***Date: Thursday, 25 April 2019***

***Time: 15:00 p.m. - 16:00 p.m.***

***Venue: Room 4621, Academic Building  
(near Lifts 31-32), HKUST***

***All are welcome!***