



For Favour of posting

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

**Department of Mathematics**

**Mathematics Colloquium**

**Binary Classification under different risk  
paradigms**

By

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**Abstract**

Binary classification has attracted intense research effort because of its wide applications in social, biological, and medical studies. A classifier based on training data will assign a new observation into one of the two classes, and the general goal is to find the best classifier that minimizes a specific risk. In the traditional paradigm, people study the expected classification error as the risk.

In reality, different applications might have distinct features that require risks tailored to their needs. It is of great scientific interest to explore other risk paradigms and how they are related to the traditional expected classification errors. In this talk, I will describe two risk paradigms: the Rayleigh Quotient and Neyman-Pearson paradigms. Taking into consideration the properties of modern datasets, including heterogeneity, heavy-tailed distributions and high-dimensionality, we construct classifiers under the above two risk paradigms. The theoretical basis of both classifiers are provided in terms of finite sample oracle inequalities; the performance will be shown via extensive simulation and real data analysis..

**Date: Monday, 21 January 2019**

**Time: 3:00 p.m. – 4:00 p.m.**

**Venue: Room 2463, Academic Building  
(near Lifts 25-26), HKUST**

***All are welcome!***