



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

**Department of Mathematics**

**Seminar on Statistics**

**Classified Mixed Model Prediction**

**By**

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**Abstract**

Many practical problems are related to prediction, where the main interest is at individual (e.g., in precision medicine) or (small) sub-population (e.g., in small area estimation) level. In such cases, it is possible to make substantial gains in prediction accuracy by identifying a class that a new subject belongs to. This way, the new subject is potentially associated with a random effect corresponding to the same class in the training data, so that method of mixed model prediction can be used to make the optimal prediction. We propose a method, called classified mixed model prediction (CMMP), to achieve this goal. We develop CMMP for both prediction of mixed effects and prediction of future observations, and consider different scenarios where there may or may not be a “match” of the new subject among the training-data subjects. Theoretical and empirical studies are carried out to study the properties of CMMP, including prediction intervals based on CMMP, and its comparison with existing methods. In particular, we show that, even if the actual match does not exist between the class of the new observations and those of the training data, CMMP still helps in improving prediction accuracy. Two real-data examples are considered. This work is joint with Jiming Jiang of the University of California, Davis, and J. Sunil Rao and Jie Fan of the University of Miami.

***Date: Thursday, 28 December, 2017***

***Time: 2:00p.m.-3:00pm***

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

***All are welcome!***