

# Department of Applied and Computational Mathematics and Statistics Colloquium

**Peter Song**


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will give a lecture entitled:

## *Statistical Challenges in Merging Longitudinal Cohort Data*

### Abstract

Merging data from multiple studies has been widely adopted in biomedical studies to reach more powerful statistical analysis. However, merging data of different cohorts is not a free lunch. In this talk, we discuss two major issues related to merging longitudinal datasets collected from similar studies. First, we develop a rigorous hypothesis testing procedure to assess the validity of data merging. Second, we propose a flexible joint estimation approach that enables us to analyze merged data and account for differences within subject correlations and follow-up schedules in different studies. We establish large sample properties for the proposed test and estimation procedure. Using simulation studies, we compare our method with several popular methods, including meta analysis, generalized estimating equation and mixed-effects model. It is shown that our test gives a robust control of type I error against the misspecification of working correlation structure. In addition, our joint estimation procedure leads to an improvement in estimation efficiency on the set of common regression coefficients after data merging is validated. We illustrate the proposed methods through a randomized interventional trial of asthma care. This a joint work with F. Wang and L. Wang.



**Monday, October 10<sup>th</sup>, 2011  
4:00 p.m. to 5:00 p.m.  
127 Hayes-Healy Center**