

**University of California, Irvine  
Statistics Seminar**

***Sparsity-Based Estimation of a Panel Quantile Count Data  
Model with Applications to Big Data***

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4 p.m., 6011 Bren Hall  
(Bldg. #314 on campus map)**

In this paper we introduce a panel quantile estimator for count data with individual heterogeneity, by constructing continuous variables whose conditional quantiles have a one-to-one relationship with the conditional count response variable. The new method is needed as a result of the increased availability of Big Data, which allows us to track event counts at the individual level for a large number of activities from webclicks and retweets to store visits and purchases. At the same time, the presence of many different subpopulations in a large dataset requires us to pay close attention to individual heterogeneity. In this paper, we propose a penalized quantile regression estimator and investigate the conditions under which the slope parameter estimator is asymptotically Gaussian. We investigate solutions to the computational challenges resulting from the need to estimate tens of thousands of parameters in a Big Data setting and caution against penalizing in models with substantial zero inflation and endogenous covariates by using a series of Monte Carlo simulations. We present an empirical application to individual trip counts to the store based on a large panel of food purchase transactions.

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