Seminar Talk

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Title: Latent Choice Models to Account For Misclassification Errors in Discrete Transportation Data

Abstract:

One of the most fundamental tasks when it comes to analyzing data using statistical methods is to understand the relationship between the explanatory variables and the outcome, the response. Misclassification of explanatory variables is a common risk when using statistical modeling techniques. In this dissertation, we define 'misclassification,' as a response that is reported or recorded in the wrong category; for example, a variable is registered as a one when it should have the value zero. Misclassification can easily happen in any data; in an interview setting where the respondent misunderstands the question or the interviewer checks the wrong box, or in other data sources where the researcher suspects measurements error, such as historical data. Travel surveys that elicit responses to questions regarding daily activity and travel choices form the basis for most of the transportation planning and policy analysis. The response variables collected in these surveys are prone to errors leading to mismeasurement or misclassification. One of the chapters covers the methods available in the econometrics literature applied to quantify and assess the impact of misclassification errors in auto ownership choice data. The results uncovered significant misclassification rates ranging from 1% to 40% for different auto ownership alternatives. Also, the results from latent class models provide evidence for variation in misclassification probabilities across different population segments. Models that ignore misclassification were not only found to have lower statistical fit but also significantly different elasticity effects, particularly for choice alternatives with high misclassification probabilities.

Bio:

Lacramioara Balan is a Ph.D. candidate and research assistant in the Civil and Environmental Engineering Department at Old Dominion University. She received her Master degree in Civil Engineering (Geomatics) from the Technical University of Civil Engineering of Bucharest in Romania. Her current research interests include traffic safety, transportation modeling and simulation, big data analysis, and travel demand modeling, ArcGIS.