Title: ACCOMMODATING EXOGENOUS VARIABLE AND DECISION RULE HETEROGENEITY IN DISCRETE CHOICE MODELS: APPLICATION TO BICYCLIST ROUTE CHOICE

The proposed research contributes to our understanding of incorporating heterogeneity in discrete choice models with respect to exogenous variables and decision rules. Specifically, we evaluate latent segmentation based mixed models that allow for segmenting population based on decision rules while also incorporating unobserved heterogeneity within the segment level decision rule models. In our analysis, we choose to consider the random utility framework along with random regret minimization approach. Further, instead of assuming the number of segments (as 2), we conduct an exhaustive exploration with multiple segments across the two decision rules. Within each segment we also allow for unobserved heterogeneity. The model estimation is conducted using a stated preference data from 695 commuter cyclists compiled through a web-based survey. The probabilistic allocation of respondents to different segments indicates that female commuter cyclists are more utility oriented, however the majority of the commuter cyclist’s choice pattern is consistent with regret minimization mechanism. Overall, cyclists’ route choice decisions are influenced by roadway attributes, cycling infrastructure availability, pollution exposure, and travel time. The analysis approach also allows us to investigate time based trade-offs across cyclists of different classes. Interestingly, we observed that the trade-off values in regret and utility based segments for roadway attributes are similar in magnitude; but the values differ greatly for cycling infrastructure and exposure attributes, particularly for maximum exposure levels.

Major: Civil Engineering

Educational Career:
Bachelor’s of Civil Engineering, BS, 2014, Bangladesh University of Engineering and Technology

Committee in Charge:
Naveen Eluru, Chair, Civil, Environmental and Construction Engineering
Mohamed Abdel-Aty, Civil, Environmental and Construction Engineering
Sabreena Anowar, Civil, Environmental and Construction Engineering

Approved for distribution by Naveen Eluru, Committee Chair, on December 10, 2017.

The public is welcome to attend.