Announcing the Final Examination of Sudipta Dey Tirtha for the degree of Master of Science

Time & Location: June 29, 2020 at 10:00 AM in Virtual Defense https://teams.microsoft.com/l/meetup-join/19%3ameee
Title: Modeling of Incident Type and Incident Duration Using Data from Multiple Years

We develop a model system that recognizes the distinct traffic incident duration profiles based on incident type. Specifically, a copula-based joint framework with a scaled multinomial logit model (SMNL) system for incident type and a grouped generalized ordered logit (GGOL) model system for incident duration to accommodate for the impact of observed and unobserved effects on incident type and incident duration. The model system is estimated using traffic incident data from 2012 through 2017 for the Greater Orlando region, employing a comprehensive set of exogenous variables - incident characteristics, roadway characteristics, traffic condition, weather condition, built environment and socio-demographic characteristics. In the presence of multiple years of data, the copula-based methodology is also customized to accommodate for observed and unobserved temporal effects (including heteroscedasticity) on incident duration. Based on a rigorous comparison across different copula models, parameterized Frank-Clayton-Frank specification was found to offer the best data fit. The value of the proposed model system is illustrated by comparing predictive performance of the proposed model relative to the traditional single duration model on a holdout sample.

Keywords: Incident type; Incident duration; Scaled multi-nominal logit; Grouped generalized ordered logit; Joint framework

Major: Civil Engineering

Educational Career:
Bachelor's of Bachelor of Science in Civil Engineering, BS, 2017, 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
Shamsunnahar Yasmin, Civil, Environmental, and Construction Engineering

Approved for distribution by Naveen Eluru, Committee Chair, on May 18, 2020.

The public is welcome to attend.