



Understanding the Increasing Relevance of Choice Models for Advancing Transportation Modelling in Smart Cities (May 22-26, 2023)

Overview

The recent technological advances in the fields of transportation (such as automated/electric cars), sensing (sensors for physical health, and air quality) and mobility (ridesharing applications) provide a unique opportunity to transform existing urban and non-urban regions into “Smart Cities”. According to the World Bank, about 34% of Indian population lives in urban regions. It is estimated that 50% of the population will live in urban regions by 2030. Given the projected growth of urbanization, the Smart City Initiative of developing 100 smart cities across the country is quite timely. A successful Smart City will enable future urban populations to optimally allocate limited resources while meeting sustainability, health and resilience goals. The current course proposal will focus on training the academic, public and private professionals in India on choice modelling approaches that can enhance the knowledgebase of transportation modelling efforts useful for informing Smart City infrastructure installation and data analytics for installed smart city infrastructure.

With these aforementioned objectives, the proposed course will broadly consist of three modules. The first module will discuss how survey design methods and choice modelling approaches can be employed to understand smart city infrastructure adoption decisions at the individual, household and system levels. The second module will illustrate how emerging econometric and statistical modelling approaches can serve analytics needs of the vast data compiled by smart city infrastructure. Finally, the third module of the course will focus on how existing regional transportation planning methods will need to be customized with the advent of Smart City infrastructure and data analytics.

The content in this program will include a background of traditional transportation data collection methods, approaches for eliciting stated preference survey data and using advanced modelling methods for analysing the survey data. The course modules will also cover state of the art approaches for these different types of variables. Further, the course module will provide the participants an illustration of the advanced econometric models developed for analysing such data with case studies on bicycle sharing systems, ride hailing data, traffic speed distribution on roadways and incident clearance time prediction. The course will provide specific examples such as using mobile phone based or Bluetooth based origin destination matrices for model calibration or validation. Further, case studies on how smart phone mobility applications can be developed for easier activity data collection by embedding location and travel mode recognition will be discussed. Recent research on approaches employing mobile apps for data collection and model implementation will also be presented. It is expected that participants will attain sufficient knowledge in this area after attending this program.

Objectives

The objectives of the proposed course are as follows.

- Provide an introduction to emerging Smart City Infrastructure
- Develop stated preference (SP) approaches to understand individual, household and system level user preferences for adopting new technology (such as automated cars or installation of traffic sensors)
- Provide hands on experience design of SP experiments for data collection
- Expose participants to data explosion with smart city infrastructure while providing an in-depth discussion of methods that can be adopted for data analysis
- To explore advanced choice models including mixed models for multinomial logit, generalized ordered logit, negative binomial count, and multiple discrete continuous extreme value (MDCEV) models.
- Provide a background in current transportation planning paradigm and identify future directions for customization

Course Contents

1. Introduction to Smart City Technologies, their impact on Transportation and Background on Data Collection Approaches
2. Emerging technological advances in transportation in India
3. Review of literature discussing current progress in adopting SP surveys for data collection
4. Analyzing smart city technology adoption and usage analysis using choice model
5. Traditional Discrete Choice models
6. Advanced Discrete Choice Models
7. Transportation planning approaches
8. Transportation Planning in a Smart city
9. Choice Models for Smart City Analytics

Dates	May 22-26, 2023 (Number of participants for the course will be limited to fifty)								
You Should Attend If...	<ul style="list-style-type: none"> ▪ Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic ▪ Transportation engineering professionals from State and Central Government agencies ▪ Faculty members from academic and technical institutions. 								
Fees	<p>The participation fee per person for taking the course is as follows:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Participants from abroad:</td> <td style="text-align: right;">USD 150 / INR 11700</td> </tr> <tr> <td style="padding-left: 20px;">Industry/ Research Organizations:</td> <td style="text-align: right;">INR 5900/-</td> </tr> <tr> <td style="padding-left: 20px;">Academic Institutions (Faculty):</td> <td style="text-align: right;">INR 3540/-</td> </tr> <tr> <td style="padding-left: 20px;">Academic Institutions (Student):</td> <td style="text-align: right;">INR 2360/-</td> </tr> </table> <p>Students have to submit a letter from their institution/Valid Identity card as proof of full-time student enrollment.</p> <p>The above fees include all instructional materials, computer use for practical sessions, internet facility. The course fee is inclusive of 18% GST as per institute norm. Registration fee should be paid through VNIT Payment gateway https://pay.vnit.ac.in/home.</p> <p>Boarding, lodging, and meal charges are not included in the fees. The participants will be provided single/shared accommodation in the Institute Guest house/Guest Rooms/ student hostel on payment basis.</p>	Participants from abroad:	USD 150 / INR 11700	Industry/ Research Organizations:	INR 5900/-	Academic Institutions (Faculty):	INR 3540/-	Academic Institutions (Student):	INR 2360/-
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To Apply	<p>For participants both within and outside VNIT Nagpur, a one-time fee of Rs. 500/- will be charged for registration at the GIAN portal for all future courses in subsequent years. Login and Apply at https://gian.iitkgp.ac.in/GREGN/index .</p>								

The Faculty



Dr. Naveen Eluru is a Professor in the Civil, Environmental and Construction Engineering Department at the University of Central Florida. He received his B.Tech. in civil engineering from the IIT Madras, in 2004. He received his M.S and PhD from The University of Texas at Austin in 2005 and 2010. Dr. Eluru has received several honors for his contributions including Transportation Research Board (TRB) Committee on Freight Transportation Planning and Logistics (AT015) 2018 Best Paper Award in Freight Modeling, TRB Committee on Statistical Methods (ABJ80) 2016 Best Paper Award, TRB Committee on Safety Data, Analysis and Evaluation (ANB20) 2015 Young Researcher Paper Award, and Honorable Mention Dissertation award from INFORMS Transportation Science. He has published more than 150 refereed journal papers and 170 international conference papers and 5 book chapters. He has delivered more than 30 invited talks in various countries. Dr. Eluru was listed in the Top 2% (202/19216) of authors based on Career Citation analysis in the "Logistics and Transportation" September 2022 data-update for "Updated science-wide author databases of standardized citation indicators". Dr. Eluru has received funding from National Science Foundation, Federal Highway Administration, National Cooperative Highway Research Program, Florida Department of Transportation, and US Department of Transportation with an overall credited share of about \$3.8 million. He has supervised 5 post-doctoral scholars and mentored to graduation about 16 doctoral students.



Dr Raghuram Kadali, Assistant Professor, CED, NIT, Warangal. He has received his PhD from IIT Bombay in pedestrian safety. His research areas including traffic safety, travel behaviour, non-motorized transport modelling and sustainable transport modelling. He has published research papers in refereed international and national journals and conferences.



Dr. Sita Rami Reddy, Assistant Professor, CED, VNIT Nagpur. He has received MTech and PhD from IIT Khargpur. His area of research mainly in the area of pavement engineering. He is also interested in travel behavior models. Before joining in VNIT Nagpur he has worked in Industry, research institute and private engineering colleges.

About VNIT Nagpur



Visvesvaraya National Institute of Technology, Nagpur is one of the thirty-one National Institutes of Technology in the country. The Govt. of India conferred on the Institute, the Deemed to be University status (under University Grants Commission Act, 1956 (3 of 1956)) with effect from 26th June 2002. Subsequently, the Central Govt. by Act of Parliament (National Institutes of Technology Act, 2007 (29 of 2007)) declared VNIT Nagpur as an Institute of National Importance along with all former regional engineering colleges. The Act was brought into force from 15th August 2007. Earlier, the Institute was known as Visvesvaraya Regional College of Engineering (VRCE). It was established in the year 1960 under the scheme sponsored by Govt. of India and Govt. of Maharashtra. The college was started in June 1960 by amalgamating the State Govt. Engineering College functioning at Nagpur since July 1956. In the meeting held in October 1962, the Governing Board of the College resolved to name it after the eminent engineer, planner, and statesman of the country Sir M. Visvesvaraya.

About Department of CE



The Department of Civil Engineering is one of the finest and oldest engineering departments of the Institute and stands with an immortal reputation. The department was formed along with the Institute itself and therefore is as old. The Department has highly educated and well experienced faculty members who endeavor to produce the finest engineers, contributing incredibly to the nation. The alumni of the department are widespread in India and abroad, occupying high positions in their respective fields. It has an intake of 120 students per year under UG Course and 100 per year under PG Courses. The Department also offers Ph.D. for aspiring researchers. The department is actively involved in R&D as well as consultancy projects and has collaborations with several industries, academic institutions and R&D organizations in the country and outside.



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