ABHILASH CHANDRA SINGH

Imperial College London

abhilash.singh19@imperial.ac.uk | (+44)7459334955

https://www.imperial.ac.uk/people/abhilash.singh19

https://in.linkedin.com/in/abhilashchandrasingh

EDUCATION

Imperial College London, UK

Ph.D. in Transportation Engineering | Urban Systems Lab [Fall 2019- present]

The University of Texas at Austin, USA

Graduate researcher in Transportation Engineering [2017- 2019]

M.S. in Transportation Engineering [2016- 2017]

The Cooper Union for the Advancement of Science and Art, USA

Semester Exchange student, Albert Nerken School of Engineering [2014]

Indian Institute of Technology (IIT) Bombay, India

Bachelor of Technology in Civil Engineering [2012-2016]

RESEARCH AND TECHNICAL REPORTS

14. **Singh, A.C**., F. Guo, A. Sivakumar and A. Gough. Incorporating the impacts of air pollutants and exposure to crime into accessibility-based planning: A London Case Study, (*working paper*)

13. **Singh, A.C.**, A. Faghih-Imani, A. Sivakumar, Y. Xi and E. J. Miller. Joint estimation of Accessibility measures and Multi-modal frequency of trips to account for endogeneity effects (*working paper*).

12. **Singh, A.C.**, H. Bouscasse, A. Sivakumar. Psychosocial Factors associated with Intended Use of Automated Vehicles: A Latent-Class and Latent-Variable Analysis. 9th Symposium of the European Association for Research in Transportation (hEART), Lyon, France, February 2021.

11. **Singh, A.C.**, A. Sivakumar. Accessibility in the Era of Big Data and Emerging Technologies (*working paper*).

10. **Singh, A.C.**, K.C. Abel, J.W. Hutchinson, K.M. Faust, and C.R. Bhat. Food Access for Low Income Individuals. Session on Highlights from the 2017 NHTS Data Workshop. 98th Annual Meeting of the Transportation Research Board, Washington, DC, January 2019.

9. **Singh, A.C.**, K.C. Abel, J.W. Hutchinson, K.M. Faust, and C.R. Bhat. Predictive Food Desert Simulation Modelling to increase Food Access in Underserved Communities. National Household Travel Survey (NHTS) Data for Transportation Applications Workshop in Washington, DC in August 2018.

8. **Singh, A.C.**, P. Lavieri, T. Kim, C.R. Bhat, and R.M. Pendyala. Evaluating the Effects of Consumer's Perceptions of Safety and Productive Use of Time on the Intention to Adopt Autonomous Vehicle Technology. 15th International Conference on Travel Behaviour Research, Santa Barbara, California, July 2018.

7. Bouscasse H., **A.C. Singh**, S. Astroza, C.R. Bhat. Modeling Simultaneous Choices in Transportation. Rencontres Francophones Transport-Mobilité (RFTM), Lyon, June 2018.

6. Copperman R., J. Lemp, T. Rossi, **A.C. Singh**, C.R. Bhat, R.M. Pendyala, S. Khoeini, S. Astroza. Adapting an Existing Activity Based Modeling Structure for the New York Region. 2018 TRB Innovations in Travel Modeling Conference, June 2018.

5. **Singh, A.C.**, S. Astroza, V.M. Garikapati, R.M. Pendyala, C.R. Bhat, and P.L. Mokhtarian (2018), Quantifying the Relative Contribution of Factors to Household Vehicle Miles of Travel. Transportation Research Part D, Vol. 63, pp. 23-36.

4. **Singh, A.C.**, S. Astroza, V.M. Garikapati, R.M. Pendyala, and C.R. Bhat. Quantifying the Contribution of Various Factors to Household Vehicle Miles of Travel. 97th Annual Meeting of the Transportation Research Board, Washington, DC, January 2018.

3. Boyles, S. D., C. Bhat, J. Duthie, N. Jiang, F. Dias, E. Jafari, V. Pandey, **A.C. Singh**, and C. Yahia. (2017) [Methods for Improving Consistency between Statewide and Regional Planning Models](). Texas Department of Transportation Report FHWA/TX-17/0-6900-1.

2. **Singh, A.C.**, L. Yang, and M. Al-Hussein. Predicting the Energy Output for Solar PV Systems: A Statistical Analysis. University of Alberta Research Experience (UARE) Poster Symposium, Edmonton, Alberta, July 2015

1. Yang L., E.K. Salim, **A.C. Singh**, H. Awad, H. Yu, M. Gül, and M. Al-Hussein. Integrating solar PV systems into residential buildings in cold-climate regions. University of Alberta Research Experience (UARE) Poster Symposium, Edmonton, Alberta, July 2015

TEACHING AND SUPERVISION

Advanced Transport Modelling (CIVE97126) – Teaching Assistant   [Spring '21, '20]

WORK EXPERIENCE

The Alan Turing Institute – Leeds Institute of Data Analytics | UK
Client: ASDA (Data Study Group)   [Summers 2021]
- Exploring and quantifying the effect of weather on sales at ASDA

University of Alberta - **Landmark Group of Builders |** Canada
Adviser: [Prof. Mohamed Al-Hussein]   [Summers 2015]
- Examined the capacity of Solar Photo-Voltaic (PV) systems to facilitate development of *net zero homes*
- **Established vital input variables** to estimate the total energy output of Solar PV systems
- Investigated simulation software - PVWatts and RetScreen, and compared their results with real-time data
- Achieved a **prediction accuracy of 95%** in MATLAB and R using feedforward neural network

Hindustan Construction Company | Mumbai, India
Engineering and Management Division   **[Fall 2015]**
- Worked on design and analysis of pre-stressed concrete bridges using STADD Pro, AutoCAD, MS-Excel in accordance with Indian standard codes IRC 112, 18, 21, 456, 1343

Indian Institute of Management (IIM) Lucknow | India
Adviser: [Prof Sameer Mathur]   [Summers 2014]
- Reviewed literature and analysed the dynamic pricing strategies on low-cost passenger aircrafts
- Concluded '**Leisure pricing to be higher than business pricing'** by implementing Ordinary Least Squares, Mixed Model and General Method of Moments regression on the effect of destination on price

RESEARCH PROJECTS

Research Assistant | WELLCOME Pathways to Equitable Healthy Cities
Imperial College London, London-UK   [2020-2021]
Objective: Develop a tool to understand the influence of urban transportation and land use on urban health.
- Developed a GIS-based database to integrate both opportunity information and transport-related data
- Developed a novel framework of the accessibility measures
- Developed an enhanced accessibility-measure tool, including the impacts of air pollutants, exposure to crime and quality of destinations by transport modes
- Applied this tool in the context of access to education facilities (future work: healthcare facilities) in London

Research Assistant | Transit Performance and Reliability Evaluation for Arterial Corridors
Center for Transportation Research, UT Austin   [Spring 2019]
Objective: Develop an evaluation tool to provide transit performance and reliability information for arterial corridors in Austin, Texas.

- Exploration of different transit performance and reliability metrics
- Analysis of the fusion of multiple data sources to provide a transit system assessment
- Visualization and algorithm development for the metrics suitable for Austin arterial corridors

Research Assistant | Activity Based Model for Qatar
Center for Transportation Research, UT Austin   [2017-2018]
Objective: A new version of an activity-based travel demand forecasting model is created for the State of Qatar. In collaboration with University of California at Santa Barbara and Arizona State University.
- Using Comprehensive Econometric Microsimulator of Socio-Economics, Land use and Transportation Systems (CEMSELTS) and Comprehensive Econometric Microsimulator of Daily Activity-travel Pattern (CEMDAP), a synthetic schedule generator that recreates for each resident person in the simulated region a schedule of activities and travel that reflects intra-household activity coordination for a day
- Conducting detailed data analysis at the individual, household, trip and tour level to understand the travel behavior and estimate the entire framework

Research Assistant | New York Best Practice Model Base Year Update
Center for Transportation Research, UT Austin   [2016-2018]
Objective: Update of the activity-based model for New York City and surrounding areas. In collaboration with New York Metropolitan Transportation Council, Cambridge Systematics and Arizona State University.
- Using Comprehensive Econometric Microsimulator of Socio-Economics, Land use and Transportation Systems (CEMSELTS) and Comprehensive Econometric Microsimulator of Daily Activity-travel Pattern (CEMDAP), a synthetic schedule generator that recreates for each resident person in the simulated region a schedule of activities and travel that reflects intra-household activity coordination for a day
- Conducted detailed data analysis at the individual, household, trip and tour level to understand the travel behavior and estimate the entire framework

Research Assistant | Coordinating consistency between state-wide and regional planning models
Center for Transportation Research, UT Austin   [2016-2017]
Objective: Identify potential options for coordinating state-wide and regional models, based on the chosen definition of consistency
- Conducted zone and link-based aggregation on a toy network to evaluate the implications on traffic assignment
- Working to update the OD matrices (based on trip purposes and mode) directly without running the first three steps

Master's Thesis | Quantifying the relative contribution of factors to household vehicle miles of travel
Adviser: Prof. Chandra R. Bhat, UT Austin   [2016-2017]
Objective: To develop a joint model of household Vehicle Miles Traveled and Residential choice
- This study presents a holistic analysis to identify the relative contribution of socio-economic and demographic characteristics, built environment attributes, residential self-selection effects, and social and spatial dependency effects in explaining household VMT production. The modeling framework employs a simultaneous equation model of residential location (density) choice and household VMT generation. The analysis is performed using household travel survey data from the New York metropolitan region. Model results showed insignificant spatial dependency effects, with socio-demographic variables explaining 38%, built environment attributes explaining 8.5%, and self-selection effects explaining 5.9% of the total variance in household VMT.

Undergraduate Thesis | Modelling Mixed Traffic Behavior
Adviser: Prof. Tom Mathew, IIT Bombay   [2015-2016]
Objective: To model longitudinal and lateral movement behavior under mixed traffic conditions
- Targeted behavior assessment of non-lane adhering Indian traffic with Artificial Neural Networks (ANN)
- Aimed to eradicate the indigence in existing research studies
- Driver behavior is analyzed and new efforts have been made to establish the need for vehicle based lane-changing model

COURSE PROJECTS

Evaluation of Resiliency Measures and relationship with Network Topology
Adviser: Prof. Stephen Boyles, UT Austin   [Fall 2016]
- Analyzed critical components of a test network using Network Reserve Capacity, NQ Performance Measure and System Topological Loss
- Random, Scale-free and Small-world topological ideations were used to compare the ability of network to recover from disruption causing system to lose a set of nodes or links or both
- Brief literature review of on relevance of post-disaster recovery in network resiliency

Nested Logit Model for Mode Choice: Study of Swiss-Metro
Adviser: Prof. Tse-min Lin, UT Austin   [Fall 2016]
- Processed the unordered choice data about mode choice alternatives available to decision maker
- Proposed and estimated Multinomial Logit (MNL) and Nested Logit (NL) models to compare the better-fit to data
- Proved that Nested Logit is most consistent with random utility maximization
- Model sheds light on how cost, gender, income and age affect mode choice

Adaptive Traffic Control System in VISSIM
Adviser: Prof. Tom Mathew (IIT Bombay) | Prof. Laurence Rilett (University of Nebraska, Lincoln)   [Spring 2016]
- Part of a five-member team from IIT Bombay, IIT Madras and University of Nebraska, Lincoln.
- Proposed an adaptive traffic control system based on simple heuristics
- Implemented the same in MATLAB and created a COM interface to interact with VISSIM
- Compared the performance of the system with the existing fixed control system

Co-ordination of Signalized Intersections | Analysis of Intelligent Transportation Systems (ITS)
Adviser: Prof. Tom Mathew, IIT Bombay   [Fall 2014 -Spring 2015]
- Collected, calibrated and simulated traffic data for IIT Main gate and Market gate intersections
- Optimized signal and offset timings by using traffic flow simulation software package VISSIM
- Reduced the delay by 60% by implementing coordination between the two intersections
- Studied ITS technologies implemented by the Public Transportation Systems in Zurich and Florence
- Suggested ways to ensure applicable ITS solutions for India

POSITIONS OF RESPONSIBILITY

Steering Committee- Imperial Network of Excellence in Sustainability through Life Cycle Approaches   [2021-present]

Department Academic Mentorship Program (DAMP)   [2015-2016]
- Supervised six underperforming sophomore students by one-on-one counseling and teaching

SCHOLARSHIPS/ACHIEVEMENTS

- Awarded **Department Dixon Scholarship** and **Wellcome Trust Project Scholarship** for Ph.D. in UK. [2019-2023]
- Received the Professional Development Award at UT Austin, Texas, USA   [2018]
- Received **USD 1,000** as TexITE Student Fellowship, Texas, USA   [2017]
- Awarded **fully-funded graduate fellowship** to undertake graduate studies in UT Austin [2016-2018]
- Received **USD 3,000** as semester exchange scholarship from IIT Bombay Alumni Association, US Chapter   [2014]
- Secured **All India Rank 1,321** in IIT-Joint Entrance Examination, among 500,000 applicants [2012]
- Attained **19th** position at the **Regional Mathematics Olympiad** out of 1,00,000 candidates in India [2010]

COURSES UNDERTAKEN

- **Select Past Courses:** Math-Stats 1, Econometrics 1 and 2, Bayesian Statistical Methods, Longitudinal Data Analysis, Transportation Systems Management, *TransCAD* GIS, Transportation Network Analysis, Discrete Choice Methods, MLE Statistics, Traffic Analysis and Design, Urban Transportation Planning.
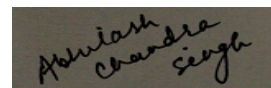
SKILLS

Design Software: SPSS, BIOGEME, GAUSS, TRANSCAD, Visual Studio	Programming Language: Python, R, C++, PostgreSQL
Computational Software: MATLAB, MATHEMATICA	Other: Microsoft Office, Spanish (beginner)

REFERENCES

- **Dr. Aruna Sivakumar** [PhD Supervisor]: Senior Lecturer, Imperial College London, UK
- **Dr. Fangce Guo** [RA Supervisor]: Research Fellow, Imperial College London, UK
- **Dr. Stephen Boyles**: Associate Professor, The University of Texas at Austin, USA
- **Dr**. **Sebastian Astroza**: Assistant Professor, Universidad de Concepción, Chile
- **Dr. Raaj Ramsankaran**: Associate Professor, Indian Institute of Technology Bombay, India

DECLARATION

I, Abhilash Chandra Singh, hereby declare that the above-mentioned details are true and accurate to the best of my knowledge.

Last updated: July 1st, 2021

Place: London, UK   (ABHILASH CHANDRA SINGH)