

# Abhilash Chandra Singh

(+44)7459334955

abhilashcsingh.github.io

as719@ic.ac.uk

**EDUCATION**      **Ph.D., Transportation Engineering**      *2019 - present*  
**Imperial College London, UK**

- Advisor: *Prof. Aruna Sivakumar*
- Other major collaborators: *Dr. Fangce Guo, Dr. Ahmadreza Faghieh Imani*

**M.S., Civil and Environmental Engineering**      *2016 - 2018*  
**The University of Texas at Austin, USA**  
*Thesis:* Quantifying the relative contribution of factors to household vehicle miles of travel

- Advisor: *Prof. Chandra Bhat*
- Thesis committee member: *Prof. Stephen Boyles*
- Other major collaborators: *Prof. Ram Pendyala, Prof. Konstadinos Goulias, Prof. Sebastian Astroza*

**B.Tech., Civil Engineering**      *2012 - 2016*  
**Indian Institute of Technology Bombay, India &**  
**The Cooper Union for the Advancement of Science and Art, USA**  
*Thesis:* Modelling Heterogeneous Traffic Behavior under mixed traffic conditions

- Advisor: *Prof. Tom V. Mathew*

**RESEARCH INTERESTS**      Theoretical and applied aspects of econometric and machine learning frameworks which address choice modelling with a focus on residential location, travel behaviour, and accessibility measurement frameworks.

**ACHIEVEMENTS & AWARDS**      Department Dixon Scholarship      *UK, 2019 - 2023*

Wellcome Trust Pathways Scholarship      *UK, 2019 - 2023*

Professional Development Award      *Texas, 2018*

Texas District Student Fellowship      *Texas, 2017*

Graduate fellowship to study at UT Austin      *Texas, 2016*

University of Alberta Research Experience (UARE) fellowship      *Canada, 2015*

Inaugural IITBAA-NY Chapter exchange scholarship      *New York, 2014*

All India Rank 1,321 (amongst 500,000), IIT Joint Entrance Exam      *India, 2012*

All State Rank 19 in Mathematics Olympiad (amongst 100,000)      *India, 2010*

**RESEARCH PROCEEDINGS**      **Singh, A.C.,** X. Zhai, F. Guo, A. Sivakumar and A. Gough. Ex-Post Analysis of Covid Disruption on Urban Accessibility in London (working paper)

**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)

**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).

**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.

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

**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.

**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.

**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.

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

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.

**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.

**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.

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.

**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

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  
EXPERIENCE**

**Imperial College London** 2020, '21, '22  
Advanced Transport Modelling (CIVE97126) Teaching Assistant and Examiner

**ACADEMIC  
SERVICE**

**Steering Committee Member:** Imperial Network of Excellence in Sustainability through Life Cycle Approaches 2021 - *present*  
**Department Academic Mentorship Program (DAMP):** Provided one-on-one counseling and teaching to sophomore students at Indian Institute of Technology Bombay 2015 - 2016  
**Techlabs London:** Volunteer mentor to two groups of total 25 participants providing support on data science and machine learning 2021 - *present*  
**Urban Systems Lab, Imperial College London:** Organized bi-weekly seminar series with over 12 national and international guest presentations 2021 - *present*  
**Reviewing Activities:**  
Transportation 2021 - *present*  
Transportmetrica A: Transport Science 2021 - *present*  
World Symposium on Transport and Land Use Research 2021  
Transportation Research Record 2019 - *present*

**WORK  
EXPERIENCE**

**Senior Data Scientist** **ASDA Business Services**  
Leeds, UK 2021 - *present*  
Working within the ASDA Business Services Digital Transformation group to provide machine learning and data products expertise to support activities of the business. Build products in Microsoft Azure with extensive use of Apache Spark and Delta within Databricks. Use cases supported includes commercial forecasting and supply chain forecasting. Participating in best practice in ML and Data Science such monitoring, MLOps as well as technologies such as Databricks.

**Data Science Researcher** **Alan Turing Institute**  
Leeds Institute of Data Analytics, UK Summer 2021  
Developed novel statistical and Machine Learning solutions to predict sales for ASDA sales data of over 93 million data points, for 150 selected Product Profile Groups (PPGs), at over 600 ASDA stores over a three year period. Performed extensive exploratory analysis of the data, applied linear models, generalised linear models, multilevel regression and random forest methods to unravel weather-sales relationship and increase forecasting accuracy.

**WELLCOME Trust - Pathways to Equitable Healthy Cities**  
Imperial College London 2019 - *present*

**Research Assistant** **Pathways to Equitable Healthy Cities**  
Imperial College London, UK 2019 - *present*  
Co-developed a GIS-database to integrate both opportunity information and transport data, thereby leveraging this unique database to develop novel accessibility measures for London. Developed the first ever London specific accessibility-tool which includes the impacts of air pollutants, exposure to crime and quality of destinations by transport modes. Novel research studies based on this research are detailed in publications.

**Research Assistant** **Center for Transportation Research**  
Austin, Texas Spring 2019  
Established transit performance and reliability metrics to develop an evaluation tool for arterial corridors in Austin, Texas. Evaluation tool performed at intersection of regional and state-wide big data source to provide a transit system assessment. Visualization and algorithm development for the metrics suitable for Austin arterial corridors were developed with a team of three researchers.

**Research Assistant**

Austin (remote)

**ItalConsult & MOTC Qatar**

2017 - 2018

In this project in collaboration with University of California - Santa Barbara and Arizona State University, a new version of an activity-based travel demand forecasting model is created for the Ministry of Transport and Communication (MOTC) Qatar. This simulator includes population synthesis that recreates the entire resident population of this region, provides locations for residences, workplaces, and schools for each person, estimates car ownership and type as well as main driver for each vehicle, and provides other key personal and household characteristics. Then, a synthetic schedule generator recreates for each resident person in the simulated region a schedule of activities and travel that reflects intra-household activity coordination for a day. These synthetic schedules are then converted to multiple Origin Destination (OD) matrices at different times in a day and used in other modeling tasks developed by ItalConsult.

**Research Assistant**

Austin (remote)

**New York Metropolitan  
Transportation Council**

2016 - 2018

In this project in collaboration with Cambridge Systematics and Arizona State University, the activity-based travel demand forecasting model is updated for New York Metropolitan Transportation Council (NYMTC). This simulator includes population synthesis that recreates the entire resident population of this region, provides locations for residences, workplaces, and schools for each person, estimates car ownership and type as well as main driver for each vehicle, and provides other key personal and household characteristics. Then, a synthetic schedule generator recreates for each resident person in the simulated region a schedule of activities and travel that reflects intra-household activity coordination for a day. These synthetic schedules are then converted to multiple Origin Destination (OD) matrices at different times in a day and used in other modeling tasks developed by Cambridge Systematics.

**Research Assistant**

Austin

**Texas Department of  
Transportation**

2016 - 2017

Identified 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. Updated state-of-the-art four-step transportation planning model using SAM framework.

**Research Intern**

Mumbai, India

**Hindustan Construction Company**

Fall 2015

Designed and analysed pre-stressed concrete bridges using STADD Pro, AutoCAD, MS-Excel in accordance with Indian standard codes (IRC 112, 18, 21, 456, 1343).

**Research Intern**

Landmark Group of Builders

**University of Alberta, Canada**

Summer 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 percent in MATLAB and R using feed-forward neural network.

**Research Intern**

Lucknow, India

**Indian Institute of Management**

Summer 2014

Analysed dynamic pricing strategies on low-cost passenger aircrafts. Concluded 'Leisure pricing to be higher than business pricing' by implementing OLS, Mixed Model and GMM on the effect of destination on price.