# Sreekumar M.

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Assistant Professor, Department of Civil Engineering, National Institute of Technology Karnataka, Surathkal, Mangalore - 575025, India

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## Education

**Indian Institute of Technology Bombay**  MUMBAI, INDIA
   **Ph.D. in Civil Engineering (Specialization:  Transportation Systems)** *Jul '12 – Nov '18*
      Thesis:  Multi-class continuum traffic flow modelling using traversable distance for dynamic travel time predictions

**Indian Institute of Technology Guwahati**  GUWAHATI, INDIA
   **M. Tech in Civil Engineering (Specialization:  Transportation Systems)** *Jul '10 – Jul '12*
      Thesis:  Development of car-following model for heterogeneous traffic with no lane discipline

**Government Engineering College, Thrissur**  THRISSUR, INDIA
   **B. Tech in Civil Engineering** *Jun '04 – Jun '08*

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## Experience

**National Institute of Technology Karnataka**  SURATHKAL, INDIA
   **Assistant Professor, Department of Civil Engineering** *Sep '19 – present*

**Jyothi Engineering College, Thrissur**  THRISSUR, INDIA
   **Associate Professor, Department of Civil Engineering** *May '19 – Sep '19*

**National Institute of Technology Calicut**  KOZHIKODE, INDIA
   **Ad-hoc Faculty, Department of Civil Engineering** *Jul '18 – May '19*

**MET's School of Engineering, Mala**  THRISSUR, INDIA
   **Lecturer in Civil Engineering** *Aug '09 – Jul '10*

**KMC Constructions Limited, Hyderabad**  THRISSUR, INDIA
   **Junior Engineer, Structures** *Jan '09 – Aug '09*

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## Research Areas

Traffic flow modelling and simulation; Analysis of Transportation Systems; Traffic Management and Design

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## Teaching

**1.** CV852 Traffic Engineering and Management - PG Elective (Odd 2020, Odd 2021, Odd 2022)

**2.** CV849 Traffic Simulation and Modelling - PG Elective (Even 2020, Even 2021, Even 2022)

**3.** CV201 Elements of Surveying - UG Core (Odd 2020, Odd 2021, Odd 2022)

**4.** CV100 Civil Engineering Materials and Construction - UG Core shared with Dr.  Pavan G. S. (Odd 2020, Even 2020, Even 2022)

**5.** CV216 Civil Engineering Materials Lab - UG (Odd 2022)

**6.** CV265 Surveying Practice - UG (Even 2021, Even 2022)

**7.** CV367 Highway Materials and Concrete Testing Lab - UG (Even 2021)

**8.** CV747 Transportation Design Studio - PG (Even 2020)

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## List of Publications

Refereed Journals

**1.** Sreekumar, M., Joshi, S. M., Mathew, T. V., and Chatterjee, A., 2021.  A multi-class first-order traffic flow model to explain disordered behaviour of vehicles. *Transportmetrica B: Transport Dynamics*, pp.  1-20. https://doi.org/10.1080/21680566.2021.1957726

**2.** Sreekumar, M., and Mathew, T. V., 2020.  Modeling multi-class disordered traffic flow subject to varying vehicle composition using the concept of traversable distance. *International Journal of Modern Physics C* *31*(12), pp.  1-25.  https://doi.org/10.1142/S0129183120501703

**3.** Sreekumar, M., and Mathew, T. V., 2020. Modelling multi-class disordered traffic streams using traversable distance: a concept analogous to fluid permeability. *Transportmetrica A: Transport Science* 16(3), pp. 1531-1551. https://doi.org/10.1080/23249935.2020.1764661

**4.** Sreekumar, M., Joshi, S. M., Chatterjee, A., and Mathew, T. V., 2019. Analyses and implications of higher order finite volume methods on first-order macroscopic traffic flow models. *Transportation Letters* 11(10), pp. 542-557. https://doi.org/10.1080/19427867.2017.1419843

**5.** Sreekumar, M., Malgonde, A., and Mathew, T., 2016. Applicability of continuum models with bi-regime flux Function for dynamic travel time predictions. *Transportation Research Procedia 17*, pp. 693-702. https://doi.org/10.1016/j.trpro.2016.11.125

Conference Proceedings

**International Conferences**

**1.** Naidu, A., and Sreekumar, M. Development of a multi-class continuum model for disordered traffic flow. *6th Conference of Transportation Research Group of India*, December 2021, Trichy, India.

**2.** Gangadhar, K., and Sreekumar, M. Traffic assignment using a class specified density based travel time function. *6th Conference of Transportation Research Group of India*, December 2021, Trichy, India.

**3.** Krishnan, V., and Sreekumar, M. Development of a hybrid choice model to evaluate the electric vehicle adoption in India. *6th Conference of Transportation Research Group of India*, December 2021, Trichy, India.

**4.** Sreekumar, M., Arun, N., and Mathew, T. A methodology to represent the disordered behaviour of vehicles for modelling mixed traffic streams. *4th Conference of Transportation Research Group of India*, December 2017, Mumbai, India.

**5.** Sreekumar, M., Malgonde, A., and Mathew, T. V. Numerical experiments on a continuum traffic flow model to demonstrate the (in)appropriateness of flux functions. *3rd Conference of Transportation Research Group of India*, December 2015, Kolkata, India.

**6.** Sreekumar, M., and Mathew, T. V. Performance evaluation of continuum model's numerical solutions in short-term traffic predictions. *18th Euro Working Group on Transportation*, July 2015, Delft, The Netherlands.

**7.** Sreekumar, M., Malgonde, A., and Mathew, T. V. Applicability of continuum models with bi-regime flux function for dynamic travel time predictions. *11th Transportation Planning and Implementation Methodologies for Developing Countries*, December 2014, Mumbai, India.

**8.** Sreekumar, M., and Maurya, A. K. Need for a comprehensive traffic simulation model in Indian context. *IJCA Proceedings on International Conference on Emerging Frontiers in Technology for Rural Area* Vol. 5 (2012), pp. 13-18. https://pdfs.semanticscholar.org/2160/52afa26a4170e81787f73a261f60c8b338d8.pdf

**National Conferences**

**9.** Sreekumar, M., and Mathew, T. V. A macroscopic model-based approach to analyse and quantify the implications of disordered stream behaviour on travel time predictions. *National Conference on Resilient Infrastructure*, December 2020, Trivandrum, India.

**10.** Sreekumar, M., Mathew, T. V., and Snehajan, S. Applicability of a simple continuum model on travel time prediction in mixed traffic conditions. *Colloquium on Transportation Systems Engineering and Management*, May 2014, Calicut, India.

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# Guidance

PhD Thesis

**1.** Vijai Krishnan V, Feasibility analysis of electric mobility in India, 2020-to date.

**2.** Arichandran R., Driver Behaviour modelling using learning algorithms (Joint guidance with Dr. Mithun Mohan), 2020-to date.

**3.** Preetha Nair, Dynamic traffic assignment for multi-class disordered traffic, 2021-to date.

M. Tech Dissertation

**1.** Sai Bharath Kumar Chapala, Development of a dynamic traffic assignment framework for two-class disordered traffic flow, 2021-22.

**2.** Karunakanti Rahul Chandra, Modelling the effect of spatial distribution of vehicles in multi-class disordered traffic flow, 2021-22.

**3.** Chintapatla Snetha, Network-level calibration of a multi-class traffic flow model using the state-of-the-art optimization algorithms, 2021-22.

**4.** Tanmay Gupta, Variance-based sensitivity analysis for the calibration of computationally expensive traffic simulation models, 2021-22.

**5.** Tarun Patidar, Modelling the behaviour of adoption of electric vehicles in the context of a developing country, 2021-22.

**6.** Mohammed Sadiq, Analysis of the impact of the roadside bus stop on capacity using microsimulation, 2021-22.

**7.** M. N. Abhiram Naidu, Macroscopic simulation of an urban corridor having multi-class and disordered traffic flow, 2020-21.

**8.** K. Gangadhar, Traffic assignment using a class specified density based travel time function, 2020-21.

**9.** P. Ashoka Chakravarthi, Evaluation of data-driven models for prediction of trends in class-specific travel times, 2020-21.

**10.** Peddabudi Srikanth, Mode choice analysis of urban travellers using RP data: A case study of Hyderabad metropolitan region, 2020-21.

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## Professional Activities

### Collaborative Work

**Newcastle and Mumbai Partnership on Sustainability and Environment Research (NAMPSER):** Visited Newcastle University, UK in Feb-Mar 2015 to take part in the joint collaborative project between Newcastle University and IIT Bombay under UK-India Education and Research Initiative (UKIERI) funded by British Council.

### Invited Lectures

Resource Person for Faculty Development Programme titled 'State-of-the-art Modeling Techniques in Civil Engineering' organised by Vardhaman College of Engineering, Hyderabad, Sep 2021.
*Talk title*: An Insight into Traffic Flow Modelling and Simulation

Resource Person for AICTE sponsored Faculty Development Programme titled 'India's Strategic Transport Infrastructure Development Projects and Programs' organised by NITK Surathkal, Aug 2021.
*Talk title*: An Overview of Manual on Road Safety Audit

Resource Person on 'Traffic Engineering and Management', Short-term Training Programme organised as a part of twinning activity under TEQIP-III, Engineering College Jhalawar, Rajasthan, Feb 2020.

Resource Person on 'LaTeX and Technical Writing', Workshop organised by Jyothi Engineering College in association with the Institute of Engineers (India) - Students Chapter, Thrissur, Nov 2019.

Resource Person on 'Hands-on LaTeX and Technical Writing', Faculty Development Programme organised by AIKTC School of Engineering & Technology, Mumbai, Jan 2018.

Presentation titled 'Continuum Models and their Numerical Implementation for Real-time Applications in Mixed Traffic Conditions', Institute of Transport Studies, University of Leeds, UK, Mar 2015.

### Workshops/Conferences

**NCRI 2020 Conference:** Member of Scientific Committee National Conference on Resilient Infrastructure 2020) jointly organised by IIT Palakkad and Kerala Highway Resaerch Institute, December 2020.

**TPMDC Conference Series:** Member of Registration, Session Logistics and Technical Visit Committees for International Conference on Transportation Planning and Implementation Methodologies in Developing Countries 2012, 2014 and 2016, IIT Bombay, Mumbai.

### Sponsored Research and Consultancy Projects

**Development of Indian Highway Capacity Manual:** Student Coordinator for various research activities including traffic data collection, extraction and analyses.                    Jan '13 – Jan '15
Agency: Council of Scientific & Industrial Research (CSIR) - Central Road Research Institute (CRRI), New Delhi, India.                    PI: Prof. K. V. Krishna Rao, IIT Bombay

**Bloomberg Global Initiative on Road Safety:** Assisted in traffic data collection for the joint research project on monitoring and evaluation of road safety in Mumbai.                    Apr '16 – Feb '18
Agency: Johns Hopkins International Injury Research Unit, USA.        PI: Prof. P. Vedagiri, IIT Bombay

**Traffic Impact Assessment:** Assisted in traffic impact assessment for proposed residential complex and municipal public parking in Mumbai.                    Mar '14
PI: Prof. Tom Mathew, IIT Bombay

**Material Testing:** Bitumen, Road aggregates (PMGSY project), Paver block, Concrete cube Nov '20 – Aug '22

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