Sai Sesidhar Vullapu

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ABOUT ME

Doctoral Researcher in Transportation Systems at IIT Kharagpur with expertise in Transport Planning, Geo-informatics, and simulation modelling (PTV Vissim, Visum, GIS). Skilled in applying machine learning and statistical methods to mobility, safety, and freight logistics. Experienced in consultancy and stakeholder engagement for sustainable infrastructure planning with publications in international journals.

WORK EXPERIENCE

Indian Institute of Technology Kharagpur   https://www.iitkgp.ac.in

City: Kharagpur | **Country:** India | **Name of unit or department:** Ranbir and Chitra Gupta School of Infrastructure Design and Management

[07/2023 – Current] **Research Scholar**

Teaching Assistant

- Multimodal Urban Transport Systems
- Public Transport Planning

Conferences

I have been a part of the organizing committee for the international conference "*Infrastructure and Built Environment: Towards Sustainable and Resilient Societies*" organized by the Ranbir and Chitra Gupta School of Infrastructure Design and Management (RCGSIDM), IIT Kharagpur.

MOOC Courses - Teaching assistant for the NPTEL course "Introduction To Multimodal Urban Transportation Systems (MUTS)" By Prof. Arkopal Kishore Goswami

Consultancy projects

(i) TUTEM: Technologies for Urban Transit to Enhance Mobility and Safe Accessibility - involved in data collection, analysis and choice modelling.

(ii) SAFAR: Safe and Accessible Future with AI on Roads - Involved in stakeholder interaction, data collection and VISSIM simulations.

School of Planning and Architecture Vijayawada

City: Vijayawada

[01/2024 – 04/2024] **Visiting Faculty**

Visiting faculty for the Lab Subject - Applications of Geo-informatics. Lectures related to applications of remote sensing in environmental planning, along with hands-on experience with practical exercises in GIS.

School of Planning and Architecture Vijayawada   https://www.spav.ac.in/

City: Vijayawada | **Country:** India | **Name of unit or department:** Department of Planning

[07/2022 – 07/2023] **Assistant Professor**

Theory Subjects Taught: Public Transport Planning, Freight and Logistics, and Regional Transport Planning.

Studio Projects

- Comprehensive Mobility Plan for Jodhpur City. On-site data collection and building a travel demand model for the city using PTV VISUM.
- Transport Infrastructure Plan for Dehradun Mussoorie Region - A mobility-based infrastructure plan considering tourists and logistics flow in a hill station (Demand modelling exercise using PTV VISUM).

Lab Courses

- Geospatial Techniques for transportation - Hands-on training for students using simulation software such as Network Analyst (GIS), PTV Vissim, and PTV VISUM.
- Application of Geo-informatics - Hands-on training for students, remote sensing and satellite imagery-based spatial analysis, like NDVI, NDBI, LST, and Watershed mapping using GIS.

Consultancy Projects

- Polavaram Irrigation Project Rehabilitation and Resettlement Plan - Community-level infrastructure planning.
- Railway Station Area redevelopment plan - Initial formulation.

Guided PG Theses: 2 and UG Thesis: 1

Jawaharlal Nehru Architecture and Fine Arts University   https://jnafau.ac.in/

City: Hyderabad | **Country:** India | **Name of unit or department:** Department of Urban and Regional Planning | **Business or sector:** Education

[22/09/2021 – 19/07/2022] **Assistant Professor**

Theory Subjects Taught: Traffic and Transportation Planning, Planning Techniques, Environmental Studies and Planning Legislation.

Studio Projects

- Site Planning and Built Environment studio
- Traffic Workshop - Area Traffic Plan for Banjara Hills, Hyderabad.

Consultancy Projects

- Station Area Development Plan for Charlapally Railway Station - The main objective was to decongest the Secunderabad Railway Station (a Major Railway terminal in the region) and facilitate the infrastructure to handle additional passenger influx at Charlapally.
- Principal Investigator - Logistics bundling as a step towards efficient freight transport: A case of Hyderabad.

Andhra Pradesh Urban Infrastructure Asset Management Limited

City: Vijayawada

[04/2021 – 06/2021] **Consultant GIS**

- Preparation of GIS Maps - Base Maps, Natural Drainage flow maps, and Sewerage network maps for various Urban Local Bodies in Andhra Pradesh.
- Preparation of Detailed Project Reports (DPRs) for liquid waste management in the ULBs.

EDUCATION AND TRAIN-ING

[07/2023 – Current] **Doctor of Philosophy**

Indian Institute of Technology Kharagpur

City: Kharagpur | **Country:** India |

In my PhD, I am working on studying driving behaviour in mixed traffic conditions and its implications on safety. I have used ML algorithms and sequential probabilistic models for risk monitoring and prediction.

Major Skills: Decision modelling, Design and Analysis of Experiments, Report Writing, Latex, Python, R Studio, SPSS, Machine Learning, and Deep Learning algorithms.

[2023 – 2025] ## Master of Arts (Economics)

Indira Gandhi National Open University

City: New Delhi | **Country:** India | **Field(s) of study:** Social sciences, journalism and information: ● *Economics*

The course provided exposure to various concepts of Economics like Microeconomic analysis, Quantitative methods for economic analysis, International trade and finance & Economics of the Social sector and Environment.

[08/2019 – 07/2021] ## Master of Planning (Transportation and Infrastructure)

School of Planning and Architecture Vijayawda

City: Vijayawada | **Country:** India | **Field(s) of study:** Engineering, manufacturing and construction: ● *Architecture and town planning* | **Final grade:** 8.53 | **Thesis:** Streamlining Freight Transport Through Planning Interventions in Vijayawada City

[2015 – 2019] ## Bachelor of Technology

Jawaharlal Nehru Architecture and Fine Arts University

City: Hyderabad | **Country:** India | **Field(s) of study:** Field unknown

[2020 – 2022] ## Post Graduate Diploma in Applied Statistics

Indira Gandhi National Open University

Field(s) of study: Natural sciences, mathematics and statistics: ● *Statistics* | **Final grade:** 69%

Although statistics have been a part of my coursework in UG and PG, travel demand modelling has triggered my interest in statistics. This course helped me gain a deeper understanding of major concepts as follows.

- Descriptive Statistics - Measures of central tendency and dispersion, curve fitting, correlation and regression analysis.
- Probability Theory - Univariate and bivariate random variables, Expectation, Discrete and continuous probability distributions.
- Statistical Inference - Sampling distribution, confidence intervals, parametric and non-parametric tests.
- Statistical Techniques - Sampling techniques, Completely randomized design, Randomized block design, Latin square design and Factorial experiments.
- Industrial Statistics - Process and Product Control, Game Theory, Time Series Modelling and Queueing Theory.

LANGUAGE SKILLS

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

PTV-VISSIM SOFTWARE | PTV VISUM | geographic information systems | R | IBM Statistical package for Sciences (SPSS) | Overleaf & LaTeX | MS Office (Word, Excel-VBA, Power Point) | Python (computer programming) | AnyLogic | Travel Demand Modelling | Transport Economics | Driving Behaviour | Logistics and Freight Management | Applied Statistics

PUBLICATIONS

[2026] **Multidimensional driving risk prediction: A machine learning approach with instrumented vehicle data**

Sesidhar V.S, Arkopal. K.G., Madhumita P. (2025). "Multidimensional driving risk prediction: A machine learning approach with instrumented vehicle data," 105th Annual Meeting of the Transportation Research Board, 2026. (Communicated)

Journal Name: 105th Annual Meeting of the Transportation Research Board

[2023] **Streamlining Freight Transport Through Planning Interventions in Vijayawada City**

Reference: Vullapu, S.S., Jain, J., Tarafdar, A.K. (2023). Streamlining Freight Transport Through Planning Interventions in Vijayawada City. Urban Commons, Future Smart Cities and Sustainability. Springer Geography.

This publication is the outcome of my Master's Thesis at the School of Planning and Architecture, Vijayawada.

Authors: Sai Sesidhar Vullapu, Jagrati Jain & Ayon Kumar Tarafdar | **Volume, Issue and Pages**: p847-885 | **Publisher**: Springer

[2023] **Influence of Regional Transport Accessibility on Development of Settlements: A Case of Visakhapatnam Region**

Jain, J., Vullapu, S. S., & Gupta, N. (2023). INFLUENCE OF REGIONAL TRANSPORT ACCESSIBILITY ON DEVELOPMENT OF SETTLEMENTS: A CASE OF VISAKHAPATNAM REGION. *PLANNING MALAYSIA*, *21*(26).

Journal Name: Planning Malaysia

[2024] **Potential of Alternative Technology for Urban Freight—A Case of Dehradun**

Supriya, B. *et al.* (2024). Potential of Alternative Technology for Urban Freight—A Case of Dehradun. In: Goswami, A.K., Aithal, B.H., Maitra, S., Banerjee, A. (eds) Infrastructure and Built Environment for Sustainable and Resilient Societies. IBSR 2023. Sustainable Civil Infrastructures. Springer, Singapore.

Publisher: Springer

[2023] **Identifying the parameters influencing the adoption of electric intermediate public transport: a case area of Gwalior city**

Jain, J., Sai Sesidhar, V., & Vardhan, P. (2023). Identifying the parameters influencing the adoption of electric intermediate public transport: a case area of Gwalior city. *IOP Conference Series: Earth and Environmental Science, 1129(1), 012045.*

[2025] **Analyzing driver emotion and behavior during peak and off peak traffic conditions"**

Sesidhar V.S, Arkopal. K.G., Madhumita P. "Analyzing driver emotion and behavior during peak and off peak traffic conditions". 8th Conference of the Transportation Research Group, 2025. Guwahati. (Accepted and Recommended for Transportation in Developing Economies).

Journal Name: 8th Conference of the Transportation Research Group

NETWORKS AND MEMBERSHIPS

American Society of Civil Engineers

Member since 2024 with Membership No. 000012502676

[2021]   **Institute of Town Planners, India**   New Delhi

Associate member with Membership No. AITP/2021/0131

CONFERENCES AND SEM-INARS

[15/04/2025 – 16/04/2025]   **Understanding Geospatial Techniques for Transportation Planning- Software & Modelling techniques**

I was invited as an expert speaker for a two-day workshop related to a detailed introduction to geospatial applications in transportation planning using PTV Visum for travel demand modeling and public transport analysis. Hands-on training was given to participants through real-world demand modelling exercises on PTV VISUM. Handling the network objects and the processing of demand matrices, operating various spatial analyses and evaluations are the major areas covered. The procedures for transport assignments of private and public transportation networks have also been demonstrated.

Link: https://www.youtube.com/live/FN30XdhXqsE

[05/07/2023 – 11/07/2023]   **Simulation Techniques for Intersection Design in Urban Transport Planning**

Programme Coordinator and instructor for a 6-day Executive Development Programme. The programme is designed to develop knowledge on the intersection design techniques aimed at improving the skills of researchers and practitioners in the field of Transportation planning. Demonstration of improving intersection design and implementation of traffic management strategies, like signaling, has been done using PTV VISSIM.

Link: https://www.spav.ac.in/2023/notices/website-edp2.pdf

[20/02/2023 – 22/02/2023]   **PTV Vissim and Visum - Training for Faculty and Students**

Resource person for the workshop organized by RV College of Architecture, Bengaluru

CERTIFICATIONS

[19/08/2019 – 23/09/2019]   **PTV Vissim and Visum basic training course**

The training course and certification were offered by PTV group by a PTV certified trainer.

PTV VISUM

- Network model structure and processing of basic elements.
- Graphic parameter and Network check and validation
- Volume delay function
- Four-stage Demand modelling in PTV Visum.
- Presentation of results.

PTV VISSIM

- Links and Connectors
- Static routing decisions
- Vehicle inputs and Traffic compositions
- Fixed time signals
- Evaluations