Kudurupaka Vamshi Krishna

Personal Data

DOB and Place:	9th December 1996 and Edunuthula, Telangana
Designation:	**Doctoral candidate**, Human FRST Lab, Transportation Engineering Group Department of Civil Engineering
Institution:	Indian Institute of Technology Roorkee (IITR), Roorkee, Uttarakhand India-24766
Mobile:	+91 8251078831
email:	kv_krishna@ce.iitr.ac.in; vamshikrishnakudurupaka@gmail.com
Research Interests:	Human factors in active and passive road safety, ITS, assistive technology and psycho-physiological behaviour

Education

2020-2025 **Ph.D.**
Major: Transportation Engineering,
Department of Civil Engineering,
Indian Institute of Technology Roorkee (IITR) | Roorkee | UTTARAKHAND | INDIA
Supervisor: **Prof. Pushpa Choudhary**

2018-2020 **M.Tech**
Major: Transportation Engineering,
Department of Civil Engineering,
National Institute of Technology Rourkela (NITR) | Rourkela | ODISHA | INDIA
Supervisor: Prof. Prasanta Kumar Bhuyan
GPA: 9.34/10

2014-2018 **B.Tech**
Department of Civil Engineering,
Institute of Technology (IT), GGV (A Central University), Bilaspur |
CHHATTISGARH | INDIA
Supervisor: Prof. Nikhil Kumar Verma
GPA: 7.7/10

2012-2014 **Intermediate** in Science and Maths,
Narayana Junior College, Hyderabad | TELANGANA | INDIA
Percentage: 96.7

MAY 2012 **Matriculation**,
Anjali High School, Suryapet | TELANGANA | INDIA
GPA: 9.5/10

Current Research Work: Ph. D.

Dissertation Title: BEHAVIOURAL ASSESSMENT OF DISTRACTED PEDESTRIANS AT INTERSECTIONS

Brief description of work: The research began with acquiring video footage and conducting eye-tracking experiments in the field. In addition, the virtual environments of these sites, using Unity 3D, have been recreated. Using the scenarios developed, the impact of various distraction activities was assessed using a cutting-edge virtual reality-based pedestrian simulator set-up complemented by an eye tracker. To better understand habitual and perceptual behaviours the **Distracted Pedestrian Behavior Questionnaire** was used.

To mitigate distracted walking, a 3D model of a **distracted walking cautionary signboard** was de-

signed to evaluate the effectiveness of the signboard. In addition, two innovative technological solutions were developed: **(1). Traffic Signal Actuated Illuminated Crosswalk (TSAIC)** for signalized intersections and **(2). Haptic Alert Wristwatch System (HAWS)** for unsignalized intersections. Both solutions are currently being tested in a pedestrian simulator setup and have reached **Technology Readiness Level 5 (TRL 5)**, with functional prototypes created using the Arduino IDE platform and with relevant sensors. The effectiveness and adaptability of these solutions are being evaluated using the **Technology Acceptance Model**.

The impact of distractions on pedestrians was assessed by modelling their risky behaviours through Surrogate Safety Measures (SSM), situational awareness, waiting time, and compensatory behaviours. Various regression and classification methods were employed for the modelling, including machine learning techniques, Markov Models, and survival modelling approaches.

Publications and Conferences

PUBLICATIONS

1. **Krishna, K. V.** and Choudhary, P., Does Listening to Music Impact Pedestrian Safety while Crossing the Road? Investigating using the VR Approach. *Transportation Research Part F: Traffic Psychology and Behaviour*, 111, 162-176. https://doi.org/10.1016/j.trf.2025.03.001
2. **Krishna, K. V.** and Choudhary, P. (2025). Unravelling situational awareness of multi-tasking pedestrians through average gaze fixation durations: An accelerated failure time modelling approach, Accident Analysis and Prevention, 211, p.107912. https://doi.org/10.1016/j.aap.2024.107912
3. **Krishna, K. V.**, Kapruwan, R., & Choudhary, P. (2024). Understanding distracted pedestrians' risky behaviour: The role of walking and visual characteristics through a field study. *Transportation Research Part F: Traffic Psychology and Behaviour*, 101, 111-129. https://doi.org/10.1016/j.trf.2024.01.003
4. **Krishna, K. V.** and Choudhary, P., Estimating Situational Awareness and Predicting Gaze Allocation Strategies of Pedestrians using Markov Model, *Transportation Research Record: Journal of the Transportation Research Board* **(Accepted)**
5. **Krishna, K. V.** and Choudhary, P., Assessing the Implications of Distraction on Waiting Time of Pedestrians: An Accelerated Failure Time Modelling. **(In pipeline)**
6. **Krishna, K. V.** and Choudhary, P., Evaluating the Risky Behaviour of Distracted Pedestrians using an Interpretable Machine Learning Approach. **(In pipeline)**
7. **Krishna, K. V.** and Choudhary, P., Unveiling the effectiveness of countermeasures to alert distracted pedestrians **(In pipeline)**
8. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Effect of Illuminated Crosswalk on Temporal Compliance Behavior of Pedestrians: A Connected Simulator Study. **(In pipeline)**
9. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Effect of Haptic Watch on Risky Behaviour of Pedestrians: Co – Simulation Environment Testing Strategy. **(In pipeline)**
10. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Role of Technical Interventions in Enhancing Pedestrian Safety: A Systematic Review. **(In pipeline)**

CONFERENCES

1. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Effect of Illuminated Crosswalk on Temporal Compliance Behavior of Pedestrians: A Connected Simulator Study. *17th World Conference on Transport Research Society (WCTRS), 6 to 10 July 2026, Toulouse, France.* **(Under review)**
2. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Effect of Haptic Watch on Risky Behaviour of Pedestrians: Co – Simulation Environment Testing Strategy. *17th World Conference on Transport Research Society (WCTRS), 6 to 10 July 2026, Toulouse, France.* **(Under review)**

3. Surya C S, Shivam Kumar, **Krishna, K. V.**, Choudhary, P. and Sonal Atreya, Role of Technical Interventions in Enhancing Pedestrian Safety: A Systematic Review. *17th World Conference on Transport Research Society (WCTRS), 6 to 10 July 2026, Toulouse, France.* **(Under review)**
4. **Krishna, K. V.**, and Choudhary, P., Estimating the Effectiveness of a Smart Crosswalk to alert Distracted Pedestrians at Signalized Intersection. *17th World Conference on Transport Research Society (WCTRS), 6 to 10 July 2026, Toulouse, France.* **(Under review)**
5. **Krishna, K. V.** and Choudhary, P., Assessing the differences in situational awareness of distracted pedestrians using the concept of Markov Entropy, *17th World Conference on Transport Research Society (WCTRS), 6 to 10 July 2026, Toulouse, France.* **(Under review)**
6. **Krishna, K. V.** and Choudhary, P., Modelling Waiting Time Behaviour of Distracted Pedestrians Using Survival Analysis Approach, *8th Conference of the Transportation Research Group of India (CTRG 2025), Guwahati, India, 17th to 20th December 2025.* **(Accepted)**
7. **Krishna, K. V.** and Choudhary, P., Examining the variations in situational awareness of impaired pedestrians using Markov Entropy modelling, *37th International Co-operation on Theories and Concepts in Traffic safety (ICTCT), Berlin, Germany, 23 to 24th October 2025.*
8. Vanshmeet, K., Jain, V., **Krishna, K. V.** and Choudhary, P., A Software Solution for Analysis and Heatmap generation for Pupil Core Eye Tracking Data. *37th International Co-operation on Theories and Concepts in Traffic safety (ICTCT), Berlin, Germany, 23 to 24th October 2025.*
9. **Krishna, K. V.** and Choudhary, P., Estimating Situational Awareness and Predicting Gaze Allocation Strategies for Pedestrians Using Markov Model, *Transportation Research Symposium 2025, Rotterdam, The Netherlands.*
10. **Krishna, K. V.** and Choudhary, P., Assessing the Implications of Distraction on Waiting Time of Pedestrians: An Accelerated Failure Time Modelling, *Transportation Research Board (TRB) 104th Annual Meeting, held in Washington D.C., 5th to 9th January 2025.*
11. **Krishna, K. V.** and Choudhary, P., Analysing the Impact of Listening to Music Among Pedestrians while Crossing the Road, *15th International Conference on Applied Human Factors and Ergonomics (AHFE 2024), Université Côte d'Azur, Nice, France, 24 to 27th July, 2024.*
12. **Krishna, K. V.** and Choudhary, P., A Comparison of Visual Scanning Behaviour of Pedestrians at Signalized and Unsignalized Intersections through an Outdoor Study Paradigm *Transportation Research Board (TRB) 103rd Annual Meeting, held in Washington D.C., 7-11th January 2024.*
13. **Krishna, K. V.** and Choudhary, P., Investigating Effects of Distraction on Pedestrian Crossing Behaviour: An Experimental Study using an Eye-Tracker in Field, *Transportation Research Board (TRB) 102nd Annual Meeting, held in Washington D.C., 8-12th January 2023.*
14. **Krishna, K. V.** and Choudhary, P., Assessment of Changes in Pedestrian Risky Behaviour while being Distracted, *14th edition of Traffic and Granular Flow (TGF), IIT Delhi, India, from 15-17th October 2022.* https://tgf.iitd.ac.in/Abstracts.pdf

Masters Dissertation Work

Dissertation Title: ANALYSING LATERAL GAP BEHAVIOR OF TWO WHEELERS IN HETEROGENEOUS TRAFFIC STREAM

Brief description of work: The analysis and data collection of lateral gap behaviour in two-wheelers were conducted using the Dynamic Traffic Data Acquisition (DTDA) system, a custom-designed instrumented vehicle. This DTDA system employs ultrasonic sensors to measure the lateral gap between the subject vehicle and interacting vehicles. The interacting vehicles were identified by visually interpreting the videos recorded by cameras mounted on the vehicle. Additionally, the lateral gap data collected from the ultrasonic sensors were transmitted via Bluetooth to a custom-designed Android app. This app records the GPS location of the subject vehicle and exports the final data, which includes both the lateral gap measurements and GPS location, into CSV format, saving it within the app.

Conference

1. Biswal, M., **Vamshi krishna, K.**, Sahoo, S., and Bhuyan, P. K. (2022). Motorized Two Wheeler Lateral Clearance Behavior in Heterogeneous Traffic: A Sensor-Based Approach. *International*

Conference on Structural Engineering and Construction Management (SECON'21) https://doi.org/10.1007/978-3-030-80312-4_73

Bachelors Dissertation Work

Dissertation Title: AN EXPERIMENTAL STUDY ON FLY ASH BASED GEOPOLYMER CONCRETE

1. **Major project:** December 2017 - April 2018
   - **Brief description of work:** Analyzing the effect of the curing at elevated temperatures (24, 48, 72 hours) and the curing time (60 °C and 120 °C) on the compressive strength of Geopolymer concrete based on fly and comparison with normal concrete based on OPC for different water-cement ratios.
2. **Minor project:** July - November 2017
   - **Brief description of work:** Comparing the compressive, flexural and split tensile strength of the Geopolymer concrete with regular concrete and to see the effect of curing time (24, 48, 72hrs) and curing temperatures (60°C and 120°C) by the replacement of the cement with Fly Ash and Alkaline Activators.

Memberships

1. ASCE Member (ID: 12431256)
2. AAAM Member (ID: 1506662)

Work Experience: Summer internship

SUDHAKARA INFRATECH PVT. LTD., Raichur, Karnataka, India: From **11th May-14th June 2017**

- Responsible for conducting field and laboratory tests on the locally available pavement materials.
- Monitored the construction process while ensuring quality standards of construction materials.

Teaching assistant for tutorials

1. Engineering Drawing
2. Airport Planning and Design
3. Highway and Traffic Engineering (Laboratory testing)
4. Traffic Analysis and Design

REVIEWER FOR PEER-REVIEWED JOURNALS

1. IATSS Research
2. Transport Research Board
3. Transportation Research Part F: Traffic Psychology and Behaviour
4. Transportation Research Interdisciplinary Perspectives
5. Expert Systems with Applications
6. Nature Scientific Reports

Honors and Awards

- Received prestigious full financial support under the **International Travel Support (ITS)** program by the **Anusandhan National Research Foundation (ANRF)** (formerly known as SERB), DST, GoI, to attend AHFE 2024 at Université Côte d'Azur, Nice, France, from 24th to 27th July 2024.

Presentations

1. Presented the functionalities and use cases of a **connected simulator setup** at the Indian Institute of Technology Roorkee (IITR), India, on September 18, 2023.
2. Presented hands-on training session on scenario creation and data handling at the **Applications of Driving Simulators and Virtual Reality in Road Safety Research** workshop held at IIT Roorkee on October 25th and 26th, 2024.

MERIT SCHOLARSHIPS

1. **MHRD PhD Scholarship | 2020-2025:** The Ministry of Human Resource and Development (MHRD) in India awarded a scholarship to pursue a PhD at **Indian Institute of Technology Roorkee (IITR)** from 2020 to 2025.
2. **MHRD Master's Scholarship | 2018-2020:** The Ministry of Human Resources and Development (MHRD), India, awarded a scholarship to pursue a master's at **National Institute of Technology Rourkela (NITR)** from 2018 to 2020.
3. **MHRD CSS Scholarship | 2014:** In 2014, the Ministry of Human Resource and Development (MHRD) in India awarded a National Means-Cum-Merit scholarship through the **CENTRAL SECTOR SCHEME (CSS) OF SCHOLARSHIPS FOR COLLEGE AND UNIVERSITY** to a student who attained a high percentage **(96.7)** in Intermediate education.
4. **DST INSPIRE | 2012:** In 2012, the Department of Science and Technology (DST) in India selected the top one per cent of matriculation rankers through the **'Innovation in Science Pursuit for Inspired Research'** (INSPIRE) program and sponsored a five-day internship camp.

SKILLS

PROGRAMMING

- Python (Intermediate), C (Intermediate), C++ (Intermediate), and R (Intermediate)

SOFTWARES

- AutoCAD, SUMO, MATLAB, Unity 3D, Arduino IDE, IBM SPSS, and Amos.

LANGUAGES

- English - Professional Fluency
- Hindi - Basic Fluency
- Telugu - Mother Tongue

EXTRA CIRCULAR ACTIVITIES

1. Assisted in organizing the **Applications of Driving Simulators and Virtual Reality in Road Safety Research** workshop, which was co-hosted by IIT Roorkee, IIT Bombay, IIT Hyderabad, IIT Jammu, and CSIR-CRRI Delhi and took place at IIT Roorkee from October 25th to 26th, 2024.
2. Assisted the **Travel and Accommodation Committee** in coordinating travel and accommodation arrangements for participants at the 2nd International Conference on Transportation Infrastructure Projects: Conception to Execution (TIPCE) held at IIT Roorkee, Uttarakhand, India, in September 2022.
3. Worked as a volunteer in **Robin Hood Army** NGO from 2018-2020 for teaching elementary education to underprivileged section kids in Jagda Basti, Rourkela, Odisha, India.
4. Assisted in organizing **RC IC nitro car** racing in Equilibrio-Techfest 2019, Institute of Technology, GGV (A Central University), Bilaspur, Chhattisgarh, India.

REFERENCES

Dr. Pushpa Choudhary
(Doctoral thesis supervisor)
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Dr. Indrajit Ghosh
(Internal research committee member)
Professor
SAFETRIP Lab
Transportation Engineering Group
Department of Civil Engineering
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Dr. Prasanta Kumar Bhuyan
(Master's thesis supervisor)
Associate Professor
Transportation Engineering
Department of Civil Engineering
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