

An Indian-Australian research partnership

Project Title:	Evaluating surrogate safety on shared space using simulation	
Project Number	IMURA0629	
Monash Main Supervisor (Name, Email Id, Phone)	Dr. Inhi Kim, inhi.kim@monash.edu ,	<i>Full name, Email</i>
Monash Co-supervisor(s) (Name, Email Id, Phone)	Dr. Kun An, kun.an@monash.edu	
Monash Department:	Civil Engineering	
IITB Main Supervisor (Name, Email Id, Phone)	Dr. P.Vegagiri, vedagiri@civil.iitb.ac.in	<i>Full name, Email</i>
IITB Co-supervisor(s) (Name, Email Id, Phone)		
IITB Department:	Civil Engineering	

Research Academy Themes:

Highlight which of the Academy's Theme(s) this project will address?

(Feel free to nominate more than one. For more information, see www.iitbmonash.org)

1. Advanced computational engineering, simulation and manufacture
2. Infrastructure Engineering
3. Clean Energy
4. Water
5. Nanotechnology
6. Biotechnology and Stem Cell Research
7. Humanities and Social Sciences

The research problem

The mixed traffic is common in India. Many underperformed moto vehicles and unmortised vehicles share roads with normal cars including buses and trucks. The situation is not same in Australia since all vehicles are required to be inspected before they are introduced in the market. However, mixed-traffic is becoming more common in urban areas. With a great attention on using a bike, it is often observed many bike riders share same roads with vehicle drivers. The wide variety of vehicles and the variation in their size and vehicle performance create different types of safety problem. In order to identify accident likelihood locations, a numerous number of accident analysis have been conducted. Transport simulation became a useful tool for evaluating safety for decades. However, since only one vehicle occupies a single lane and no collisions occur in simulation environment, some modifications and different treatments are needed. Also the driving behaviour and lateral behaviour related parameters should be investigated to allow the vehicles in a lane can drive on the left, on the right or in the middle without specifying a lateral orientation.

Project aims

The main aim of this research is to provide an alternative framework for crash prediction for mixed traffic streams. This framework uses current transportation simulation to estimate the surrogate safety as a function of the traffic flow, density, lane width, lateral space, width of shoulders, and the horizontal and the vertical alignment of the road. The research is to identify safety on commercial and residential roadways by identifying a likelihood of collisions for mixed traffic streams that accommodate motor vehicles, bicycles and many other types of transport modes.

Expected outcomes

- Identify what major factors affect lateral driving behaviour in mixed traffic stream;
- Investigate other potential factors that might affect driving behaviour;
- Collect data on driving behaviour for different types of surrounding vehicles;
- Develop a calibration and validation framework for simulation
- Identify appropriate safety related performance measures.

How will the project address the Goals of the above Themes?

The project involves advanced computational skills which develop simulation models to predict the likelihood of collisions. The outputs of this project also provide an insight of the quality infrastructure design for mixed traffic streams.

Capabilities and Degrees Required

- An undergraduate qualification and significant experience in the relevant discipline area.
- An established record of outstanding transportation related research as evidenced by publication record.
- Sound teamwork and communications skills and leadership in conducting research projects.
- Demonstrated links with relevant external organisations and the profession.

The candidate with some experience in programming languages (C/C++/MATLAB/Python) will be preferred.

Potential Collaborators

Please visit the IITB website www.iitb.ac.in OR Monash Website www.monash.edu to highlight some potential collaborators that would be best suited for the area of research you are intending to float.

Please provide a few key words relating to this project to make it easier for the students to apply.

Simulation; safety; mixed traffic; surrogate;