IITB-Monash Research Academy

Indian Institute of Technology Bombay | MONASH University

An Indian-Australian research partnership

Project Title:	**Impact and implication of Connected and Autonomous Vehicles**	
Project Number	**IMURA0737**	
Monash Main Supervisor (Name, Email Id, Phone)	Prof Hai L. Vu, hai.vu@monash.edu,	*Full name, Email*
Monash Co-supervisor(s) (Name, Email Id, Phone)		
Monash Head of Dept/Centre (Name,Email)	Prof. Jeffrey Walker, jeff.walker@monash.edu	*Full name, email*
Monash Department:	Civil Eng.	
Monash ADRT (Name,Email)	Prof. Chris Hutchinson, christopher.hutchinson@monash.edu	*Full name, email*
IITB Main Supervisor (Name, Email Id, Phone)	A/Prof. Gopal R. Patil, gpatil@iitb.ac.in	*Full name, Email*
IITB Co-supervisor(s) (Name, Email Id, Phone)		*Full name, Email*
IITB Head of Dept (Name, Email, Phone)		*Full name, email*
IITB Department:		

Research Clusters:

Highlight which of the Academy's CLUSTERS this project will address? *(Please nominate JUST **one.** For more information, see www.iitbmonash.org)*	
1	*Material Science/Engineering (including Nano, Metallurgy)*
2	*Energy, Green Chem, Chemistry, Catalysis, Reaction Eng*
3	*Math, CFD, Modelling, Manufacturing*
4	*CSE, IT, Optimisation, Data, Sensors, Systems, Signal Processing, Control*
5	*Earth Sciences and Civil Engineering (Geo, Water, Climate)*
6	*Bio, Stem Cells, Bio Chem, Pharma, Food*
7	*Semi-Conductors, Optics, Photonics, Networks, Telecomm, Power Eng*
8	*HSS, Design, Management*

Research 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*

The research problem

Define the problem

Underpinned by emerging technologies, connected and autonomous vehicles (CAVs) are expected to introduce significant changes to driver behaviour as well as traffic flow dynamics, and traffic management systems.

Project aims

Define the aims of the project

The aims of this project are to

1) investigate the impact of CAV on traffic flows and network performance, and

2) evaluate new possibilities for efficiently managing traffic on future urban road networks

via the development of traffic model and simulation tools utilising existing available traffic micro simulation software.

Expected outcomes

Highlight the expected outcomes of the project

The expect outcomes are

1) Suitable simulation model for CAVs
2) New ways of managing future traffic with CAVs
3) Expected benefits using CAVs

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

Describe how the project will address the goals of one or more of the 6 Themes listed above.

The project develops novel mathematical models based on which new, advanced computational methods and simulation will be developed to cater for the future mobility needs.

Capabilities and Degrees Required

List the ideal set of capabilities that a student should have for this project. Feel free to be as specific or as general as you like. These capabilities will be input into the online application form and students who opt for this project will be required to show that they can demonstrate these capabilities.

The candidate should have

1) a solid background in mathematics and optimisation

2) good software engineering skills (i.e. programming skills) to develop and use traffic simulation packages

3) good writing and communication skills

4) having (preferable but not compulsory) back ground and experience in traffic modelling

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.

Both Monash Faculty of IT and Faculty of Science (Mathematics group) has optimisation expertise that will enable the collaboration with this project.

Select up to **(4)** keywords from the Academy's approved keyword list **(available at www.iitbmonash.org)** relating to this project to make it easier for the students to apply.