

An Indian-Australian research partnership

Project Title:	Dynamic traffic assignment with CAV	
Project Number	IMURA0703	
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Research Clusters:

Research Themes:

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

The research problem

Define the problem

Dynamic traffic assignment (DTA) is a useful mathematical tool for traffic network management and transport planning. DTA has evolved substantially in the last decade and now plays an important role in the development of real time approaches that can be deployed for large scale applications. DTA encompasses a broad spectrum of mathematical problems underpinned by different decision variables,

traffic behavioural and system assumptions. The emerging of advanced technologies, such as connected and autonomous vehicles (CAV), fundamentally change these behaviours and raise questions about the validity and realism of the assumptions made in DTA models. This research will investigate the changes, address the weaknesses in DTA models and improve their applicability for the future transport management and planning.

Project aims

Define the aims of the project

The aims of this project are

- 1) investigate the impact of CAV in behavioural model and system assumptions in DTA
- 2) develop new, suitable model to reflect the changes in behavioural
- 3) develop new DTA to incorporate CAV traffic

Expected outcomes

Highlight the expected outcomes of the project

The expected outcomes are

- 1) New behavioural model given the present of CAVs
- 2) New DTA model for heterogeneous traffic with CAVs
- 3) Applications of DTA with 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.

Computational science, Data mining