

Project Title: Working and prospective memory in the performance of young and old drivers

Project Number HSS1008

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IITB Department: Humanities and Social Sciences

Research Clusters:

Research Themes:

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

The research problem

Define the problem

With rapid urbanisation and technological advancements every human being is affected directly or indirectly by driving, be it a baby sitting in a car, or individual crossing a road. Normal cognitive abilities affect the process of driving in a critical way. A positive correlation has been found between cognitive functioning and driving performance (Aksan et al., 2012). Working and prospective memory are two important processes since they are associated with unique skills that are required in driving such as remembering things to be performed in future, rehearsal, spatial coding, updating visual and spatial information. Nevertheless, their level of significance is relatively lesser known, which creates a scope of research in this area. Therefore, a better insight is required to understand how they affect individual's driving performance.

Project aims

To study the role of working and prospective memory in the performance of young and old drivers.

What is expected of the student when at IITB and when at Monash?

Student at IIT Bombay is expected to complete his/her course work, Literature review, and formulation of research problem, design, collection of data, interpretation, and writing the report. AI

Student at Monash University is expected to collect the data on both young and old driver, writing the report. Studies at both the places will be incorporated and combined results will be written and prepare the thesis.

Expected outcomes

Medical diagnosis is not reliable enough to predict the driving capability of the driver. The study would aid in designing better tests for cognition-based filtering of driving applicants. It would further reduce the chances of accidents. Besides, countermeasures can be designed to improve the performance of individuals who are shown to lag in these particular abilities. This scientific study can also serve as a guiding tool for policy makers and government officials in implementing better laws for driving safety and accident prevention.

Potential RPCs from IITB and Monash

1. Prof. Avijit Maji, Transportation Systems Engineering, Civil Engineering, IIT Bombay. He has expertise in driving behaviour
2. Prof. Swati Pal, IDC School of Design, IIT Bombay, Mumbai. She has expertise in Cognitive Ergonomics and Design for elderly
3. Prof. Mrinmoyi Kulkarni, HSS, IIT Bombay, She has expertise in social psychology and health.

Capabilities and Degrees Required

M.Sc/M.A in Psychology /Neuroscience

B.Tech/M.Tech

Knowledge of E- Prime, Transportation Research, Eye-tracker, and EEG is desirable

Necessary Courses

1. Research Method
2. Statistics
3. Human Cognitive Process

Potential Collaborators

1. Professor Jennie Oxley, University of Monash
2. Prof. Avijit Maji, IIT Bombay

Select up to **(4)** keywords from the Academy's approved keyword list (**available at <http://www.iitbmonash.org/becoming-a-research-supervisor/>**) relating to this project to make it easier for the students to apply.

1. Transportation and Traffic Engineering and Logistics
2. Miscellaneous/Uncategorised
3. Signal Processing
4. Humanities