

An Indian-Australian research partnership

Project Title:	Communication over wireless channels under secrecy constraints	
Project Number	IMURA0443	
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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

The research problem

Define the problem

Wireless communications are naturally prone to eavesdropping by third parties. Traditional techniques to secure the communications are based on cryptographic schemes operating at the application layer. In a wireless communications link the physical layer can be exploited to enhance the security and privacy. Unlike cryptographic techniques, such physical layer techniques can also provide unconditional security which do not rely on the limitation in adversary's computational power. We will investigate physical layer

techniques for communication under privacy constraints, and also fundamental limits on rates for such problems.

Project aims

Define the aims of the project

The project aims at designing a suite of physical layer primitives for secure and private wireless communications.

Expected outcomes

Highlight the expected outcomes of the project

The project aims at designing a suite of physical layer primitives for secure and private wireless communications.

A minimum of three publications in Q1 journals in the field

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.

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.

Good understanding of wireless communications, information theory, and coding theory. Good analytical ability is a must.

Degree in Electrical Engineering, or Electronics and Tele-communication Engineering. Candidates with masters degree should have specialization in communication engineering.

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.