IITB-Monash Research Academy

An Indian-Australian research partnership

Indian Institute of Technology Bombay

MONASH University

Project Title:	**Artificial intelligence, from the lab to the field**

Project Number | IMURA0792

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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

As part of the IITB-Monash joint Research Academy, the Woodside Innovation Centre at Monash will support a PhD candidate. This will be an applied PhD, harnessing fundamentals, with the prospect and view toward industrial application. The proposed research will focus on machine learning utilising TensorFlow™ (an open-source software library for Machine Intelligence). By working with Woodside engineers, the candidate will identify challenges to be solved using machine learning. An example is to utilise machine learning for interrogation of datasets corresponding to the assessment of defects that may include either (i) corrosion, or (2) pipeline welding anomalies. This will allow automated defect interpretation. Such tools may be implemented in support of day-to-day activities. Whilst TensorFlow

was originally developed for machine learning and deep neural networks research, the general nature of the system is widely applicable, providing the candidate with a range of skills applicable in many domains and industries.

Project aims

Development of machine learning methodologies for engineering applications, and for trial in field deployment.
The project will develop and deploy artificial intelligence algorithms in expert systems, using combinations of strongly and weakly supervised models, and tested against industrial performance.

Expected outcomes

The project will develop and deploy artificial intelligence algorithms in expert systems, using combinations of strongly and weakly supervised models, and tested against industrial performance.

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

The project is firmly in line with: Advanced computational engineering, simulation and manufacture. The project will combine diverse groups, including Materials Science and Engineering, Computer Science and Engineering, and an industry partner.

Capabilities and Degrees Required

- The successful candidate will require at least a basic to intermediate skills in computation and coding, and a passion to learn. Preferred programming familiarity includes Python, or C++.

- Any prior exposure to machine learning is a plus.

- The candidate is expected to be a good communicator, professional and enthusiastic.

- Applicants from the following disciplines will be considered. Engineering (any discipline), Computer Science or Software Engineering, Information Technology, or Physics.