

An Indian-Australian research partnership

Project Title:	AI for Weather Smart Agricultural Advisory	
Project Number	IMURA1296	
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IITB Department:	Climate Studies	

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	7	Infrastructure
8	HSS, Design, Management		

The research problem

Define the problem

Climate-smart agriculture and irrigation management involving improved weather forecasts, high-quality satellite data, crowdsourced qualitative information and sparsely located sensor data can solve the problem. Here we propose to develop and implement such a solution to the Cotton farmers. Through a participatory framework involving farmers, NGOs, and other stakeholders. The methodology will include data-guided physics-based hybrid modeling, the use of advanced AI/ ML, data quality control, system development for data collection, and dissemination of advisory

Project aims

Define the aims of the project

1. Development of climate-smart agricultural and irrigation advisory system
2. Participatory framework
3. High-resolution weather and S2S forecasts
4. Translating the new development to the field in village by development of Language Model

How skills/experience of the IITB and the Monash supervisor(s) support the proposed project

Highlight the purpose of the collaboration and/or the complementary skills/experience that you bring to the project. Do you have any joint or independent publications in the area of the proposed project?

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

The students should develop the physical understanding and complete data collections (site visit) during IITB stay. During the Monash stay, he/ she is supposed to work on refined language models.

Expected outcomes

Highlight the expected outcomes of the project

Highlight the expected outcomes of the project:

1. Climate-smart agricultural system
2. Real-time monitoring and forecasting for farmers
3. Climate adaptation through the participatory framework
4. The outcome of the research will optimise the farmer's overall input with respect to irrigation and resource utilisation

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.

AI for Adaptive and Resilient Farming Systems

How well the IITB and the Monash supervisor(s) know each other

Provide details of previous collaborations (if any). For new collaborators, have you had a chance to meet each other in person or through VC or Skype?

Currently supervising a PhD student in the program

Potential RPCs from IITB and Monash

Prof. Subhankar Karmakar and Prof. Suyash Bire

Capabilities and Degrees Required

M Tech in Computer Science and Engineering/ Civil Engineering or Masters in Climate Sciences

Necessary Courses

Will be decided based on student's background

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.

Keywords relating to this project to make it easier for the students to apply.

Large Language Models, AI, Agriculture, Climate