IITB-Monash Research Academy

Indian Institute of Technology Bombay | MONASH University

An Indian-Australian research partnership

Project Title:	**Designing and Developing Mobile Equipment, Tools & Implements for Managing Urban Solid Wastes**	
Project Number	**IMURA0920**	
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Research Clusters:

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

Research 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 **Environment***
4	*Water*
5	*Nanotechnology*
6	*Biotechnology and Stem Cell Research*
7	*Humanities and social sciences*
8	**Design**

The research problem

Define the problem

Handling and managing huge amounts of solid waste generated on daily basis in an urban area is daunting and challenging task. The main aim of present project is provide solutions for handling waste littered over the street corners, vacant plots, water bodies, behind backyards etc. Over the time, if these wastes are not collected properly, these lead to choking of drains, accumulations of floating materials over the water bodies particularly near the banks or coastlines, making the urban landscape unclean and unattractive.

Since the type of solution shall depend on the type of media to be handled, there shall be the need to design, implement and test several tools and implements for the same. These tools must be mobile so that they could be employed over large geographical areas of same kind. Mobile cleaning equipment shall be developed for sweeping street surfaces. Another set of equipment for cleaning unpaved / grassy / other surfaces. Yet another mobile unit shall be required by skimming muck floating over water surfaces.

Project aims

Define the aims of the project

The main aims of the project are developing mobile cleaning equipment

(1) for sweeping street surfaces.
(2) for cleaning unpaved / grassy / other surfaces.
(3) for skimming muck floating over water surfaces.

Also, the development of appropriate technologies for on-site / on-spot management of the wastes collected by above mentioned mobile units shall also be within the scope of present research work.

Expected outcomes

Highlight the expected outcomes of the project including likelihood of patents

Every machine developed to target any specific problem shall be novel and innovative. Every tool / equipment / implement so designed shall be of immense commercial value in market. These all shall be the products of IMURA and all with copyrights and patents.

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 8 Themes listed above.

The project will encompass themes of design, manufacture, infrastructure, clean environment and clean water.

Capabilities and Degrees Required

List the ideal set of capabilities that a student should have for this project. 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.

(1) In depth knowledge of waste management in general and solid waste in particular.
(2) Have open mind to observe and catch innovative ideas in waste handling, processing, management and disposal.
(3) Have a liking for both computers and machines.
(4) Willingness to work in institute workshop, to make hands dirty and heavy laborious tasks

Necessary Courses

List three tentative core courses relevant to the project that the student should complete during his/her coursework at IITB (the student will require to secure 8 point in these courses)

(1) Municipal Solid and Biomedical Waste Management
(2) Water & Wastewater Management
(3) Environmental Impact Assessment

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.

None in mind as of now.

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.