



ABHYAST PHASE – VII

The office of Research & Development at IIT Kanpur calls for research proposals through the Boeing University Relations program for Undergraduate students from all disciplines and years for the formulation of a robotic system to achieve the underlying proposal

Motivation

Disaster management activities are highly critical for homeland security measures and routine surveillance needs to be performed by security agencies for locating and disposing off detonating systems operated clandestinely within crowded areas by troublemakers. In view of this need IIT Kanpur through the Boeing university relations program plans to develop a robotic system which can be utilized by rescue forces, bomb squads, etc. for their day to day activities.

Problem Statement

A robotic system needs to be developed which would autonomously map an unknown indoor environment localizing the suspicious object(s) and providing this information to a ground station which will then direct a group of ground vehicles wirelessly to pick that object(s) and take it to a safe zone, thus avoiding the loss of human lives. The localizing and mapping of the area would be done through an autonomous aerial and/or ground vehicle. The ground station will plan an optimal path over which the ground robots will maneuver using the required sensors on-board.

General Information

Project Duration: One year

Team Size: Maximum team size should be 4 members.

Team Requirements: Each team is encouraged to have representatives who have expertise in

- (a) CAD designing and Basic simulation.
- (a) Sensory systems and flow control.
- (c) Control systems.
- (c) SLAM and path planning.

Presentation: Each team should submit a hard copy of the written proposal, signed by individual members, to Dr. Shantanu Bhattacharya (office address enclosed below), with their names, roll nos & email ids. They should also send a soft copy in pdf format to bhattacs@iitk.ac.in latest by 5:00pm of April 11th(Monday), 2016. They will have to make a presentation of maximum duration 10 minutes in front of a expert selection committee on April 13th(Wednesday), 2016 (6:30 pm onwards in FB370).

Judgment: Presentations will be judged by a selection committee comprising of faculty members from different disciplines at IIT Kanpur.

Results: The selected teams/individuals will be informed about the further details of the project. The results will be declared on the day of the presentation itself.

Phase-7 Project view:

- Ground bot design and manufacturing.
- Ground bot autonomous navigation.
- Indoor 3D Mapping and path planning.
- System Integration.

Phase-6

- Bag detection and localization in outdoor environment using quad-copter and camera.
- Ground bot reaches the location of the bag autonomously.
- Real-time wireless communication between ground bot, quad-copter and ground station using ROS.

TENTATIVE SCHEDULE

Date of Announcement	31 st March, 2016
Last Date of Proposal Submission	11 th April, 2016
Date of Presentation	13 th April, 2016
Announcement of Result	13 th April, 2016
Official start of project	1 st May, 2016

SPECIAL BENEFITS

- Selected team members will be funded with a monthly stipend.
- Selected team members will get opportunities to present their project work and skills to nationwide community by participating in workshops and competitions.
- The students will also be able to interact with national and international experts from Boeing Company and faculty members at IIT Kanpur.

In case of any queries, please Contact: Dr. Shantanu Bhattacharya, NL-115, Manufacturing Sciences Laboratory,