



ABHYAST PHASE - V

The office of Research & Development at IIT Kanpur calls for research proposals through the Boeing University Relations program for Undergraduate students from all the disciplines 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 environment localizing the suspicious object(s) and providing this information to a ground station where a manual controller will wirelessly direct a ground vehicle to pick that object(s) and take it to a safe zone, thus avoiding the loss of human lives. The localization and mapping of the area would be done through an autonomous swarm of aerial vehicles. The ground station will utilize this data to identify the suspicious object(s) and plan an optimal path over which the controller will maneuver the ground robot using the live feed obtained from the cameras onboard, to achieve the required task.

General Information

Project Duration: One year

Team Size: Team sizes should be between 3 to 5 members.

Team Requirements: Each team should have representatives who have expertise in

- (a) Mechanical system
- (b) Ground navigation and Path planning
- (c) Aerial navigation track for terrain mapping
- (d) Sensory systems and flow control

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 name, roll no & email ids. They should also submit a soft copy in pdf format to bhattacs@iitk.ac.in latest by 5:00pm of January 15th (Wednesday), 2014. They will have to make a presentation of maximum duration 20 minutes in front of a expert selection committee on January, 21st (Tuesday) 2014 (10:30AM 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 will be informed about the further details of the project.

Robot's Specifications

- Should be capable of picking any shape of about maximum dimensions 40X40X40cm and payload of 10kg
- Wireless communication for live feed streaming and data transmission for aerial as well as ground vehicle in range of 100m
- The bot should be able to send its approximate location using GPS or GPRS

TENTATIVE SCHEDULE

Date of Announcement	19 th December,2013
Last Date of Receiving Proposals	15 th January, 2014
Date of presentation	21 st January, 2014
Announcement of Result	29 th January, 2014
Official start of project	01 st February, 2014

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.