NOTICE INVITING EXPRESSION OF INTEREST

FOR

TRANSFER OF TECHNOLOGY

FOR

"AN AUTONOMUS BIRD DETERENT SYSTEM FOR CROP PROTECTION USING UAVs"

EOI No:

TiHAN IIT HYDERABAD

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

OSMANIA UNIVERSITY
ESTD. 1917

UNIVERSITY COLEGE OF ENGINEERING,
OSMANIA UNIVERSITY, HYDERABAD.

1. Introduction

Department of Science and Technology (DST) under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), "Govt of India" has sanctioned the prestigious Technology Innovation Hub(TIH) in the technological vertical of Autonomous Navigation and Data Acquisition Systems (UAVs, ROVs, etc.).

Technology Innovation Hub on Autonomous Navigation (TiHAN) is a multi-departmental initiative, including researchers from Electrical Engineering, Computer Science & Engineering, Mechanical, and Aerospace Engineering, Civil Engineering, Mathematics, Design, and Entrepreneurship at IIT Hyderabad with collaboration and support from reputed institutions and industry. TiHAN is recognized as a Scientific and Industrial Research Organization (SIRO) by the Department of Scientific and Industrial Research. The vision of this hub is to become a global destination for next-generation smart mobility technologies that utilize reliable and efficient autonomous navigation and data acquisition systems in the next five years.

The mission of this hub is to accelerate the adoption of autonomous navigation and next-generation smart mobility technologies for use in intelligent transportation and agricultural applications, not only in India but also in a global context.

Under the programme mentioned above, Department of Electronics &Communication Engineering, University College of Engineering, Osmania University, Hyderabad Created an Autonomous Bird Deterrent System for Crop Protection Using UAVs

An Autonomous Bird Deterrent System for Crop Protection Using Uavs:

The major agriculture products of India include Rice, Wheat Maize, even though India has emerged as a major food production entity, there exist several challenges which makes the yields to reduce, due to lack of mechanization, soil erosion, effective marketing and bird flocking. Among these bird flocking is a major issue due to which the crop may get damaged in the final stage. Bird flocks cause major damage to the crops at ripening stage. Among several methods available, only a few are effective, but those methods are very expensive.

To address this problem, this paper proposes a novel innovative, simple prototype which is designed for bird scaring based on Drone and Motion Detection Algorithms(DMDA). The proposed prototype has totally three modules; they are Bird Flocks Detection, Scaring Mechanism and Hexacopter. The first module is mounted on the top of Hexacopter and it consists of a High Resolution Camera Connected to Raspberry PI controller. Over the video captured, this module applies Temporal Difference based Motion Detection algorithm for Bird Flocks detection. Next, the Scaring unit is mounted at the bottom of Hexacopter and it consists of a loud speaker which is triggered through Raspberry PI controller upon the detection of bird flock.

Finally, the Hexacopter is operated through Drone Pilot using a Flysky Controller. Extensive filed trials of proposed prototype shown satisfactory performance on different types of crops and also reduced the manual burden extensively.

Features of Autonomous Bird Deterrent System for Crop Protection Using Uavs:

- Ease of Assembly of Hexacopter frame with Carbon propellers
- Pixhawk cube 2 controller, ESA Hobbying, BLDC Motors
- On board 2 MP HD camera and Campanian computer board, Telemetry data
- Flysky Radio Controller, LiPo Batteries, Dual Smart Charger
- GPU board with AI, AI Camera with Sensors tracking.

2. Application Area/Scope of Work

This Technology is very much suitable for

- To protect the crops from birds in order to increase the crop yield by using Drones.
- The visual scaring Methods are ineffective for the crops in larger areas in order to increase the crop yield and to increase the profit for the farmers.
- The proposed novel prototype is based on drones for bird scaring which automatically identifies the bird flocks and scares them without any harm to them. The proposed prototype can cover larger areas of crop like 10-50 acres with less cost and time
- The bird scaring based on Drone and Motion Detection Algorithms(DMDA). The proposed prototype has totally three modules; they are Bird Flocks Detection, Scaring Mechanism and Hexacopter. The first module is mounted on the top of Hexacopter and it consists of a High Resolution Camera Connected to Raspberry PI controller. Over the video captured, this module applies Temporal Difference based Motion Detection algorithm for Bird Flocks detection. Next, the Scaring unit is mounted at the bottom of Hexacopter and it consists of a loud speaker which is triggered through Raspberry PI controller upon the detection of bird flock.

3. Technology transfer

The technology will be transferred on non-exclusive basis. The technology fee will be finalized at a later stage.

The TOT Package contains the followings:

3.1. Document(s) for technology know-how and fabrication, schematics of the system

3.2. Bill of Material (BoM) of the system

3.3. Support for the Development and function of proper unit testing and validation

3.4. Technical support for a period of 6 months

4. EXPRESSION OF INTEREST(EOI)

4.1. Institution invites “Expression of Interest in the format given in Annexure-1(which may require customization based on the technology /product/service /prototype being transferred). The industries will be shortlisted based on the information furnished in Annexure - I and assessment by the TOT committee.

4.2. The submission of the EOI shall include all such documents that are specified herein to prove the authenticity of their offer and any claim made therein. The burden of proving such claims shall lie with the bidder.

4.3. All cost and expenses associated with submission of EOI shall be borne by the bidder while submitting the EOI and Institution shall have no liability, in any manner in this regard, or if it decides to terminate the process of short listing· for any reason whatsoever.

5. General terms and conditions

5.1. An. expert committee constituted by Department of ECE, University College of Engineering, Osmania University will scrutinize the applications for follow-up action.

5.2. The applicants may be called for a presentation regarding their strengths and business proposals.

5.3. All incidental expenditure incurred in preparation/submission or presentation of the EOI shall be borne by the participating agency.

5.4. Participation in this EOI does not guarantee any association with Department of ECE, University College of Engineering, Osmania University in writing.

5.5. University College of Engineering, Osmania University Hyderabad reserves the right of rejecting any offer without assigning reasons.

5.6. There is neither a business guarantee nor any commitment for funding support from University College of Engineering, Osmania University Hyderabad to the appointed/ empanelled agencies.

5.7. A Committee of experts constituted by University College of Engineering, Osmania University Hyderabad will assess capabilities and strengths of the industry before finalizing the technology partners.

5.8. The industry willing to take technology for commercial production will be required to enter into a ToT agreement with University College of Engineering, Osmania University Hyderabad as per the terms and conditions approved by the competent authority in the University College of Engineering, Osmania University Hyderabad in the prescribed format.

6. Eligibility

Industries with experience in productization of Drone Technology can apply. Professionally managed companies, Corporate and Start-ups are also welcome to apply for the technology.

7. How to apply

Interested companies/industries may send expression of interest with their details by filling the EOI form as per Annexure - I to the following address

Dr.L. Nirmala Devi,
Professor
Department of Electronics and Communication Engineering,
University College of Engineering,
Osmania University, Hyderabad-500007
Ph: +91-9949513490
Email : nirmaladevi@osmania.ac.in

Annexure-1

Details of Expression of Interest

(To be filled by the organization interested in technology transfer from University College of Engineering, Osmania University, Hyderabad)

SI No	Description of Items	Details from Organization
1.	Name of the Organization ,Address of registered office with telephone no. & fax	
2.	Certificate of registration as a manufacturing unit	
3.	Permanent Account Number	
4.	Sales Tax Number/ VAT	
5.	Status of IS09001/IS013485 Certification	
6.	Contact Details Name Designati on Address for Comm. Email & Phone	
7.	About Organization ,Website if available	
8.	Any Additional Technology development request.	
9.	Readiness level to take the technology	
10.	Any other information request	
	Feedback on the information shared by University College of Engineering ,Osmania University Hyderabad.	

Declaration

I/We hereby confirm that I/we are interested in the above technology and would productionize it as per terms and conditions. All the information provided above is genuine and accurate.

Authorized Person's Signature.

Name and Designation: Date of Signature