# Unmanned Aerial Systems Cooperative Mission for Search and Payload Delivery

Problem Statement: The team of researchers has been developing technologies to enable cooperative autonomous flight of unmanned aerial vehicles for multiple applications. For example, a team of robots or scout vehicles and payload vehicles coordinate for a given task for search or delivery operations. Researchers have developed a framework that enables the planning of missions requiring multiple vehicles. Their work addresses the need for quick area scanning using multiple vehicles for payload delivery at multiple locations autonomously.

Uniqueness of the Solution: The proposed solution uses multiple unmanned vehicles for higher efficiency in scanning large areas. Coordination between vehicles to increase the throughput of delivering payloads is a key feature. In addition, the computer vision pipeline in the framework makes the vehicles capable of onboard intelligence.

Current Status of Technology: The team has developed the prototype and completed testing in the laboratory and field-testing in relevant environments. 'Payload delivery beyond visual line-of-sight (BLOS)' with an intermediate agent acting as a communications relay between the ground station and the payload delivery vehicle is one sample mission that was executed in the IIT Bombay campus. Another sample mission, 'Search and Deploy', employs multiple scout vehicles designated to various areas to carry out the search and detect targets of interest and communicate the same to a payload delivery vehicle which then deploys the payload autonomously.

Societal Impact: The technology can be used to manage events spread over large areas and disaster management. This project has relevance in defence and internal security with specific applications for Humanitarian Aid and Disaster Relief (HADR) and Search and Rescue (SAR) missions.
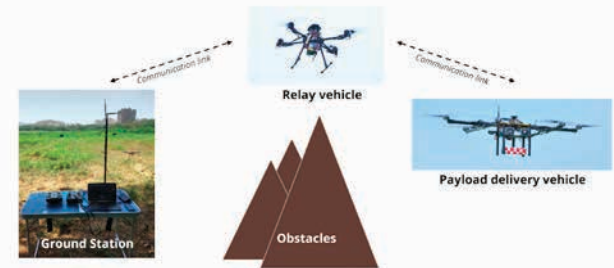
Patent(s): Nil

Relevant Industries: Defence, Aerospace, Security, Automotives.

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