SEMS: RESEARCH PROJECT DESCRIPTION

1. Project Background and Description

UAV based intelligent sensing/monitoring of disasters for situational awareness and management

The loss of life, assets and economic output that accompany natural disasters can be minimised by prompt action based on sufficient and timely information. UAV based remote sensing and monitoring present a cheaper alternative to satellite imaging, with the potential for superior data capture rates and precision. There are many applications of UAV based sensing and monitoring including, infrastructure security, habitat monitoring, traffic control, environmental monitoring, flood monitoring, and leaks detection in water distribution network, healthcare and precision agriculture. This research proposes sensing and monitoring solutions with UAV for these challenges involving industry-leading precision in localisation and imaging. The research problem requires that a quadrotor with a sensor payload be designed, fabricated and tested. This will then be followed by fabricating duplicates of these systems so that a swarm of these aircraft can work together to form a mobile sensing network. The design, manufacture, and testing of a swarm-carrier with all communication and power generation components are also required.

2. Project Scope

A quadrotor platform will be developed that will eventually be duplicated to form a swarm sensing network.

A suitable application will be identified and most suitable sensor package to be utilised is then designed as a payload that will be then adopted onto the quadrotor platform and tested.

The development of the energy generation method and the swarm-carrier vehicle will be conducted and tested with the operation of the quad-copter swarm.

3. Desired Skills from the Student

Basic concepts of engineering design, engineering instrumentation, and tele-communication

4. Supervisory Team

Primary: Dr M Hasan Shaheed
Secondary: Dr Ranjan Vepa
Additional: Dr Akram Alomainy, EECS