

Protean-UAV

Problem statement :

Design a multirotor platform which can reconfigure itself in-flight to switch between quad-, hexa- and octa- configurations. Majority of flight controllers have the capability to support multiple configurations but reprogramming is conducted offline, either before or between flights. Hence, proposed solution should take into account all aspects of UAV control to perform the dynamic transformation. Furthermore, if required, UAV frame should support structural adaptability and/or modularity to perform on-demand transformation into quad-, hexa- or octa- copter configurations. For example, retractable or collapsible arms which can be folded when they are not required.

Competition Structure:

1. After team registration closes, Tata Sons GTIO will organize a webinar to discuss problem statement and answer any queries from the teams
2. The competition will take place in 2 rounds.
3. Round 1: to be held in Oct 2016
 - a. Each team needs to submit a design proposal (not to exceed 3 pages) and CAD model(s) in any industry standard format of its choice
 - b. A panel of experts will review each proposal to shortlist top (at most) 5 teams
4. Round 2: to be held in Dec 2016
 - a. Each team needs to submit a detailed design report (not to exceed 15 pages) in the format of a research paper.
 - b. Each team is also encouraged to submit suitable supporting items, including CAD model(s), software (simulation studies, flight controller code base, test bench etc.), hardware (proof-of-concept designs) which would strengthen its case
 - c. A panel of experts will review each submission to announce the winners
5. Design metrics: stability, weight, compactness, modularity

Rules :

1. Challenge is open to B Tech and M Tech students of any discipline.
2. A team can comprise no more than 4 members.
3. A team can have no more than one mentor or advisor.
4. Each team needs to nominate a point-of-contact member.
5. Each team needs to submit a proposal in the pre-qualifying round, which will be held in October
6. Mentor(s) from Tata will be available to guide selected teams during the competition.