# DRONE COMPETITIONS

## A. Civilian Applications

### 1) UAE Drones for Good Award

http://www.dronesforgood.ae/

"The UAE Drones for Good Award is dedicated to transforming the innovative technologies behind civilian drones into practical, realizable solutions for improving people's lives today."

Seems to be a hardware competition but not limited to that subject.

### 2) UAV Challenge

https://uavchallenge.org/

"The goal of the UAV Challenge is to demonstrate the utility of Unmanned Airborne Vehicles (UAVs) for civilian applications, particularly in those applications that will save the lives of people in the future. We do this by harnessing the ingenuity and passion of aero modelers, university students and high-school students around the world to develop novel and cost-effective solutions."

"Current open competitions include:

- The UAV Challenge Medical Express – an unmanned aircraft competition that demonstrates the use of robotic aircraft for medical sample retrieval and medical delivery, and open to adult teams from around the world. This competition is focussing on autonomy of unmanned aircraft."

Seems to be a hardware competition but not limited to that subject. Sponsors include the Defence Science and Technology (DST) Group, part of Australia's Department of Defence, and Lockheed Martin Ausrtalia.

## 3) Green Country Unmanned Aircraft System Competition

https://engineering.utulsa.edu/academics/electrical-and-computer-engineering/unmanned-aircraft-system-competition/

"The goal of this competition is to demonstrate the ability of participating teams in fulfilling two popular civil applications of UAVs with quick commercialization potential. These two applications are: "package delivery" and "search and rescue" which must be accomplished outdoors and indoors respectively. Teams can participate in this competition in one or more of three different levels: fully manual, first person view control (FPV), and fully autonomous. The final score for teams in each group will be tabulated and the first three entries in each group will be recognized."

# B. Technology Competitions

## 1) International Aerial Robotics Competition (IARC)

http://www.aerialroboticscompetition.org/

"The primary purpose of the International Aerial Robotics Competition (IARC) has been to "move the state-of-the-art in aerial robotics forward" through the creation of significant and useful mission challenges that are 'impossible' at the time they are proposed, with the idea that when the aerial robotic behaviors called for in the mission are eventually demonstrated, the technology will have been advanced for the benefit of the world. As such, the International Aerial Robotics

Competition has not been a "spectator sport", but rather a "technology sport." Since its inception, over twenty-two years has passed with six successful missions having been accomplished. Each time a mission was accomplished, some aspect of the state-of-the-art in aerial robotics was advanced beyond that which had previously been demonstrated."

Suitable for our needs. Current mission has three objectives; First, "interaction between aerial robots and moving objects (specifically, autonomous ground robots). Second, navigation in a sterile environment with no external navigation aids such as GPS or large stationary points of reference such as walls. Third, interaction between competing autonomous air vehicles.

## 2) International Micro Air Vehicle Conference and Competition (IMAV)

http://www.imavs.org/          http://www.imav2017.org/

"The International Micro Air Vehicle Conference and Competition (IMAV) is a yearly event that aims at fostering key technologies for the development of micro-air vehicles. It combines a scientific conference and a flight competition intended to all research groups around the world."

"The indoor and outdoor competitions are set up to highlight the following points:

- Aircraft efficient and innovative designs

- Small and light MAVs

- Autonomy and image processing

- Multi-UAV cooperation"

"IMAV2018 will be held in Melbourne, Australia and will be hosted by RMIT from November 17th to 23rd."

Suitable for our needs.

## 3) Mohamed Bin Zayed International Robotics Challenge (MBZIRC)

https://www.mbzirc.com/

"The Mohamed Bin Zayed International Robotics Challenge (MBZIRC) is a biennial international robotics competition. MBZIRC provides an ambitious and technologically demanding set of challenges, and is open to all teams from all countries. MBZIRC aims to inspire future robotics through innovative solutions and technological excellence."

"MBZIRC 2019 will be based on autonomous aerial and ground robots, carrying out navigation and manipulation tasks, in unstructured, outdoor and indoor environments. MBZIRC 2019 will consist of three challenges and a triathlon type Grand Challenge:

Challenge 1 is based on UAV dynamic aerial tracking and interventions in 3D.

It requires a team of UAVs to autonomously locate, track and interact with a set of objects moving in space.

Challenge 2 is based on UAV and UGV picking and placing of objects in an indoor-outdoor environment.

It requires a team of robots (UAVs and UGVs) to collaborate to autonomously locate, track, pick, and deliver multiple static and dynamic objects in an outdoor-indoor environment.

Challenge 3 is based on UGV and UAV mobile manipulations in an urban fire search and rescue scenario.

It requires a team of UAVs and a UGV to collaborate to carry out a series of complex manipulations in an outdoor-indoor fire related USAR environment.

The Grand Challenge requires a team of robots (UAVs and UGVs) to compete in a triathlon type event that combines Challenges 1, 2 and 3."

## 4) Innovative Drone Exploration and Application (IDEA)

http://aviation.aiaa.org/idea/

"The objective of the competition is providing a platform for sharing ideas and research related to the design, utilization, and applications of autonomous aerial systems."

"We are soliciting submissions related to:

- Vehicle technologies
- Integration technologies
- National airspace integration
- Autonomy
- Robotics
- Machine intelligence

- UAS Traffic Management
- Propulsion and power technologies
- Command, control and communications technologies"

## 5) World Drone Challenge

http://www.worlddronechallenge.org/

"The aim of World Drone Challenge is to create an environment of simultaneous cooperation and competition that invites leading organisations and global experts to push the boundaries of drone technology beyond its current limits.  We are seeking to identify new drone capabilities by exploring the potential applications made possible by increasing weight carrying capacity (Payload) and endurance. The immediate foreseeable applications include humanitarian aid, search & rescue, and emergency relief supplies to rural and regional communities in a post natural disaster environment. There are numerous additional applications possible in the agricultural, transport and logistics industries that are ready to be discovered, and we hope that the environment of competition and collaboration will enable opportunities to be leveraged in an emergent way."

## 6) MAAXX Europe

http://maaxx-europe.com/

"FPV drone racing is great, but we're taking things up a level. MAAXX an indoor drone air race, simple as that. But there is a catch: the drone piloting can be done from a ground-station, but it must be fully automatic. This is not about human piloting skills; it is about building machines and systems that can operate without human intervention."

# C. Hardware Competitions

## 1) AUVSI SUAS

http://www.auvsi-suas.org/

"The AUVSI SUAS Competition is designed to foster interest in Unmanned Aerial Systems (UAS), stimulate interest in UAS technologies and careers, and to engage students in a challenging UAS mission. The competition requires students to design, integrate, report on, and demonstrate a UAS capable of autonomous flight and navigation, remote sensing via onboard payload sensors, and execution of a specific set of tasks. The competition has been held annually since 2002."

Hardware competition. Sponsored by US Army.

## 2) UAS Challenge (Unmanned Aircraft Systems Challenge)

https://www.imeche.org/events/challenges/uas-challenge

"Teams of undergraduates from all over the world take part in the Challenge. They undertake a full design and build cycle of a UAS with specific mission objectives. The Challenge bridges the gap between academia and industry in developing applied UAS-related activities, giving you the perfect opportunity to strengthen links with industry, other universities and enhance employment opportunities for graduates in the aerospace sector."

Hardware competition.

## 3) AIAA's Design•Build•Fly

http://www.aiaadbf.org/

"The AIAA through the Applied Aerodynamics, Aircraft Design, Design Engineering and Flight Test Technical Committees and the AIAA Foundation invites all university students to participate in the Cessna/Raytheon Missile Systems Student Design Build Fly competition. The contest will provide a real-world aircraft design experience for engineering students by giving them the opportunity to validate their analytic studies.

Student teams will design, fabricate, and demonstrate the flight capabilities of an unmanned, electric powered, radio controlled aircraft which can best meet the specified mission profile. The goal is a balanced design possessing good demonstrated flight handling qualities and practical and affordable manufacturing requirements while providing a high vehicle performance."