

Editorial Notes

The ever challenging field of marine exploration, especially underwater exploration, receives an increase in public attention every time a marine disaster such as oil platform disaster, or airliner crashing at sea, or sinking ferry, occurs. Such disasters have common characteristics: they occur in a remote area that it would take a while for any search-and-rescue vessel to reach the disaster site. Furthermore, while many SAR vessels and other resources may eventually arrive at the site, SAR operation may still not be able to be conducted effectively due to lack of coordination among them, especially if those resources belong to different authorities. High rate of fatality of such disasters seems to be unavoidable. It is believed that resources management during SAR operations can increase the effectiveness of the operation in finding and rescuing survivors. Turner et al. reports a progress on their project called CoDA (Cooperative Distributed Autonomous Oceanographic Sampling Network) that aims to developing a distributed context-based organization-reorganization mechanisms for multiagent systems. This work is very promising in providing a framework of operation that can overcome the difficulties found in remote and hostile underwater environment involving heterogeneous multi-AUVs, or agents in general.

In the meantime, for the last decades, developments on UAV designs have been converged to those having one or some of these features: nature-inspired, closer to human environment (urban environment), and VTOL capability.

The ability to fly of birds, insects, and some species of mammals (bats) has brought great fascination not only to animal physiologist but to UAV designers as well. These creatures' airborne mobility is not the only feature that attracts attention. The flexibility to maneuver in mid-air and the efficiency of their flights, all of them are achievable by the intricate flapping motion of their wings. Studies on flapping wings have been around for a while, and there has been an increase due to rapid development in computing technology that allows researchers to perform CFD analysis more extensively. Yang et al. reports their study on flapping wing. By incorporating measured data, that were obtained using stereo photography technique, into CFD analysis, the behavior of a flapping wing was observed with greater insight.

UAV designs have also been oriented to get closer to human environment. This environment is characterized by limited space or enclosed space that is relatively in opposition to the one that any conventional UAV is designed to operate in. Such environment includes outdoor urban environment and indoor environment, both of which are environments that are close to human activities. UAVs that fly in such environments needs to be very minute in order to navigate safely and to avoid interfering any activities of their inhabitants. In their respective works, Harikumar et al. and Pushpangathan et al. study these types of UAVs. Harikumar et al. reports their controller design for a fixed wing micro air vehicle (MAV), a class of UAV in the size of fifteen centimeters. Meanwhile, Pushpangathan et al. studied the dynamics of a fixed wing nano air vehicle (NAV), a class of UAV smaller than MAV in the size of seventy-five millimeters.

Quadrotor is a type of rotorcraft that is quite special among other types of rotorcraft with different number of rotors. This is due to the simplicity of their rotor control mechanism that comes from the symmetricity of their rotors placement on the airframe. Furthermore, since the nature of multirotor aircrafts is "the more rotors means the more payload capacity", quadrotor is considered to be the most powerful type of rotorcraft with the least number of rotors. And for this reason, many applications find quadrotor as the most suitable mobile aerial platform.

Studies on quadrotors have been done quite extensively. Miwa et al. studied and proposed an interesting method of controlling a quadrotor movement, by shifting the payload's mass center of the quadrotor. Quadrotors that can be ridden like bikes may appear in the near future.

New designs of rotor assembly on quadrotor airframe were proposed to achieve certain purposes. Suzuki et al. studied and proposed a quadrotor with intermeshing rotor that is estimated to have better efficiency than those with typical rotors placement. The design also allowed the quadrotor to inherit the characteristics of a tandem helicopter. Imamura et al. proposed a quadrotor design that has the capability to move forward without losing its level attitude, a desired airborne mobile platform by many applications. This design uses ducted fans instead of typical rotors assembly. The ducted fans are equipped with thrust vectoring nozzles that can be regulated to achieve horizontal movement without altering flight attitude.

The editor would like to express his sincerest appreciation to all the authors for their hard work and patience in the preparation of their contributed work. He hopes that the readers would find this issue educational, stimulating and enriching their research endeavors with novel ideas.