An Overview of Classification, Requirements, Path Planning Algorithms and Improvement Areas of Unmanned Aerial Vehicles

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Abstract

The need of Unmanned Aerial Systems (UASs) is expanding day by day as it can be used in both public and military environments. As the need for UAV is growing, there is an expansion in the requirement for more reliable, authentic, efficient, optimized and strong vehicles that are capable for executing various operations. The need of such systems is mainly by the Militaries that continue to desire more UAV functionalities for diverse operations and tasks that can be performed all over the world. To have a continuous advancement in the field of autonomous UAV control system many cogent research works has been performed. A large amount of work is focused on the subsets of UAS control such as path planning algorithms, control of small UAV and autonomy. As various markets are amplifying, the necessity to have such systems with capability to adapt according to introduced tasks, sensing elements, and surroundings will drive requirements. They can be used in several ways in various models, sizes and types according to the needs of various operations. The most common Unmanned Aerial Vehicle is "drone" that can be operated by remote controllers using radio waves. These UAVs normally contain internal memory and uses battery power as a means to an energy source. In the
current scenario, commercial drones are normally subjected to manual control by human that can control only one drone at a point of time. In accordance to set up a controlling system of multiple drones, collision avoidance mechanism and the detection of objects around these UAV systems is very necessary. This paper discusses about the UAVs requirements and capabilities along with path planning algorithms. It also provides some problems associated with a UAV system along with its improvement areas.

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Unmanned Aerial System (UAS), autonomous systems, Unmanned Aerial Vehicle (UAV), Drone, path planning algorithms.