

Parallel Tracking and Mapping of a Fleet of Quad-Rotor

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Abstract : The problem of managing a fleet of quad-rotor drones in a completely unknown environment is analyzed in the present paper. This work is following the footsteps of other studies about how should be managed the movements of a swarm of elements that have to stay gathered throughout their activities. In this paper we aim to demonstrate the limitations of a system where absolutely all the calculations and physical movements of our elements are done by one single external element. The strategy of control is an adaptive approach which takes into account the explored environment. This is made possible thanks to a set of command rules which can guide the drones through various missions with defined goal. The result of the mission is independent of the nature of environment and the number of drones in the fleet. This strategy is based on a simultaneous usage of different data: obstacles positions, real-time positions of all drones and relative positions between the different drones. The present work is made with the Robot Operating System and used several open-source projects on localization and usage of drones.

Keywords : cooperative guidance, distributed control, unmanned aerial vehicle, obstacle avoidance

Conference Title : ICMCES 2015 : International Conference on Mechatronics, Control and Embedded Systems

Conference Location : Dubai, United Arab Emirates

Conference Dates : September 13-15, 2015