

Swarm Optimization of Unmanned Vehicles and Object Localization

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Abstract : Technological advances have led to widespread autonomy in vehicles. Empowering these autonomous with the intelligence to cooperate amongst themselves leads to a more efficient use of the resources available to them. This paper proposes a demonstration of a swarm algorithm implemented on a group of autonomous vehicles. The demonstration involves two ground bots and an aerial drone which cooperate amongst them to locate an object of interest. The object of interest is modelled using a high-intensity light source which acts as a beacon. The ground bots are light sensitive and move towards the beacon. The ground bots and the drone traverse in random paths and jointly locate the beacon. This finds application in various scenarios in where human interference is difficult such as search and rescue during natural disasters, delivering crucial packages in perilous situations, etc. Experimental results show that the modified swarm algorithm implemented in this system has better performance compared to fully random based moving algorithm for object localization and tracking.

Keywords : swarm algorithm, object localization, ground bots, drone, beacon

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