OPTIMAL FLOCKING CONTROL FOR A MOBILE SENSOR NETWORK BASED A MOVING TARGET TRACKING

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TÓM TẮT:

Target tracking is an important task in sensor networks, especially in mobile sensor networks. Flocking control is used to control a mobile sensor network to track a target. However, there are some existing problems in this control method, such as the problem of how to design an optimal flocking control algorithm with optimal flocking parameters to allow the network to catch up the target as fast as possible in order to minimize the tracking time and power consumption. This paper presents an optimization problem in flocking control for a mobile sensor network to track a moving target. A non convex optimization method based on genetic algorithms is developed. The overall purpose of this approach is to find out the optimal solutions of flocking parameters that deliver desired swarm behaviors to minimize the cost function. This cost function represents the time it takes all mobile sensors (robots) in the network to catch up the moving target. The experimental tests are obtained to demonstrate our approach.