An Algorithm for Herding Cows by a Swarm of Quadcopters

Authors : Jeryes Danial, Yosi Ben Asher

Abstract : Algorithms for controlling a swarm of robots is an active research field, out of which cattle herding is one of the most complex problems to solve. In this paper, we derive an independent herding algorithm that is specifically designed for a swarm of quadcopters. The algorithm works by devising flight trajectories that cause the cows to run-away in the desired direction and hence herd cows that are distributed in a given field towards a common gathering point. Unlike previously proposed swarm herding algorithms, this algorithm does not use a flocking model but rather stars each cow separately. The effectiveness of this algorithm is verified experimentally using a simulator. We use a special set of experiments attempting to demonstrate that the herding times of this algorithm correspond to field diameter small constant regardless of the number of cows in the field. This is an optimal result indicating that the algorithm groups the cows into intermediate groups and herd them as one forming ever closing bigger groups.

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