

Flocking algorithm for fixed-wing unmanned aerial vehicles

The problem of swarms autonomous flying has been extensively studied for many years, giving a variety of great applications and contributing a lot of knowledge to the theory of swarms. In many cases, the researchers try to imitate animals which are perfectly adapted to moving collectively. Therefore, it would be a great idea to create a flock of UAVs flying like a herd of pigeons. Hence, the paper presents the algorithm of aerial flocking, which is a step towards this idea. The algorithm assumes a hierarchical and decentralized structure of the flock based on two flocking rules: of cohesion and repulsion. These rules of aerial flocking combined with the leadership in the flock, similarly as it is in a herd of pigeons, allow achieving a coherent swarm of fixed-wing UAVs. To prove this conclusion, both numerical and experimental results are presented.