

## Flocking Control of Multi-agent Systems with Application to Nonholonomic Multi-robots

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*Abstract:* In this paper, we revisit the artificial potential based approach in the flocking control for multi-agent systems, where our main concerns are migration and trajectory tracking problems. The static destination or, more generally, the moving reference point is modeled by a virtual leader, whose information is utilized by some agents, called active agents (AA), for the controller design. We study a decentralized flocking controller for the case where the set of AAs is fixed. Some results on the velocity consensus, collision avoidance, group configuration and robustness are proposed. Further, we apply the proposed controller to the observer based flocking control of a team of nonholonomic mobile robots.

*Keywords:* multi-agent systems; flocking control; nonholonomic mobile robots; decentralized control;

*AMS Subject Classification:* 93A14; 93C15;

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