Recent Advances in Swarm Intelligence and Cooperative Control

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Swarm intelligence and cooperative control are hot research topics in both scientific research and industrial application fields. Swarm systems consist of multiple agents with neighboring interactions. In the cooperative control of swarm systems, how to design the controller or protocol using only local relative information is the main challenge. Cooperative control of swarm systems is promising due to that the emerging behavior has the features of low cost, high scalability and flexibility, great robustness, and easy maintenance. It has been demonstrated that cooperative control has broad potential applications in various areas, such as cooperative control of intelligent transportation systems, distributed control of power systems, cooperation of multiple robots, distributed optimization of networked systems, formation flying of multiple satellites and unmanned aerial vehicles. Motivated by the facts stated above, more and more researchers are devoting themselves to obtain sound results on this topic.

The objective of this invited session is to present the recent advanced techniques on swarm intelligence and cooperative control. In particular, relevant papers include those on swarm intelligence, cooperative control, cooperative guidance, cooperative decision making and planning, and distributed optimization, etc.