基于改进粒子群优化的多机器人目标一致性控制

Destination Consensus Control of Multi-Robots Based on Modified Particle Swarm Optimization

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关键词：

多机器人； 粒子群优化； 一致性； 运动控制； Multi-Robots； Particle Swarm Optimization； Consensus； Motion Control

摘要：

针对不确定环境中障碍物的形状和位置等信息未知情形，通过机器人自身传感器获取环境信息，采用最小二乘方法对运行环境中两类障碍物进行拟合估计，提高机器人对环境的感知识别能力。将机器人运动目标信息、周围环境信息、机器人运动信息等衍生的适应度分量引入改进的粒子群优化适应度函数，从而提高粒子的局部选优能力；在此基础上，实现了多机器人系统的目标一致性运动控制。通过仿真实验进一步验证了该策略的可行性和有效性。

>Considering the uncertain information about the shape, size and position of an obstacle in a dynamic working environment, obstacle information is estimated by employing the least square method and acquisition data from robot sensors, which can lead to improvement of environment perception and determination capability. By defining the three fitness components via destination information, ambient environment information, robot motion information, a modified particle swarm optimization scheme is proposed to achieve the destination consensus of multi-robot systems with the advantage of good local optimization virtue. Finally, the simulation experiments demonstrated the effectiveness and feasibility of the proposed strategy.

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