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Abstracts of Short Communications and Posters

Section:

16. Applications

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Motion Planning for Multi - Agent Systems in the Time - Varying Environments

One of possible solutinos of the problem of mobile robot optimal control in the environment containing moving obstacles is considered. Each obstacle situating in 2-dimensional workspace of the robot is the circle which moves in a fixed direction at a constant speed. Start locations and radiuses of all obstacles are assumed known. Restriction on maximum capacity of robot engine is imposed. The task is to construct time-minimal collision-free path from start point robot to its goal point with zero final velocity . Pontryagin's principle of maximum is applied for solving the problem. One of extremal trajectories obtained is picked out which also satisfied to some other conditions, in particular, minimum switching of robot engine along this trajectory and way-minimal path passed by the robot. Computer programs for modeling and visualizing the robot movement in workspace containing obstacles are constructed. Also show the application of the Stilman's linguistic geometry tools to solution this problems.