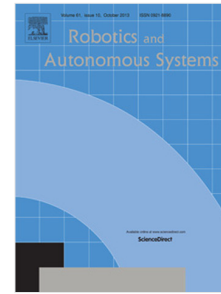


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THE TRAJECTORY GENERATION ALGORITHM FOR THE CABLE-SUSPENDED PARALLEL ROBOT – THE CPR TRAJECTORY SOLVER

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Abstract

The CPR Trajectory Solver is a procedure defined in this paper which is used to generate a smooth reference trajectory of CPR system's camera which has a task to monitor and track the object in real time. We have generated a data base of four primitive trajectories (primitives) which are chosen by the CPR Trajectory Solver during the generation of camera's complex reference trajectory. For trajectory generation, the CPR Trajectory Solver uses the knowledge about the current positions and velocity orientations of the camera and object and then it defines the goal position and velocity orientation of the camera. The CPR Trajectory Solver chooses one of the generated primitives for interconnecting the current and goal positions of the camera. After completing the chosen primitive, the CPR Trajectory Solver establishes the new positions and velocity orientations of the object. This process is repeated cyclically until the real time object monitoring and tracking task is completed. For the purpose of analyzing and using the defined algorithm, we have synthesized a program package: CPRTS (CPR Trajectory Solver). By using this program package, the simulation experiments of the camera's trajectory generation for the purpose of the object monitoring and tracking are presented. By using the CPR Trajectory Solver, motion autonomy of CPR system's camera is increased. The camera has a task to follow and monitor the chaotically moving object.

Key Words

CPR system, real time, trajectory planning, object monitoring

1. Introduction

Cable-suspended Parallel Robots, CPR systems, are complex robot systems which use cables for motion transfer. These cables are connected between the load (tool, camera, etc.) carrier and actuator sub-system: motor-gear-winch. CPR systems for different purposes have been defined and shown in

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