

Application of optimal trajectory algorithms to a solar-panel handling industrial manipulator

Authors:

Jay Krishnasamy¹, Martin Hosek, Jairo Moura
Brooks Automation,
15 Elizabeth Drive
Chelmsford, MA 01824

Several algorithms have been proposed in the last 25 years on the problem of generating time-optimal trajectories for robot manipulators along specified paths. This article describes an application of an optimal trajectory algorithm to an industrial manipulator used in the transfer of solar panel substrates between process modules. These robots operate in a vacuum environment and have constraints on substrate accelerations as well as available motor torques. The article shows that a trajectory profile optimized for both substrate acceleration and motor torques can reduce substrate transport time by 20 percent over the commonly used “S-curve” based algorithms.

¹ Corresponding author, email: jay.krishnasamy@brooks.com