Autonomous and teleoperation control of a mobile robot

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Abstract

The present work proposes an autonomous tracking control system and a control structure to combine autonomous and teleoperation commands in a bicycle-type mobile robot. This compounded operation renders great flexibility to the control system of the mobile robot. For autonomous operation, a simple tracking controller that includes compensation of the robot dynamics is developed. This tracking control system is proved to be stable in the sense that it asymptotically reaches the tracking objective. Teleoperation with visual access to the robot’s workspace is integrated via a joystick with the autonomous operation of the robot. Simulations and experimental results on a prototype robot show the feasibility and performance of the proposed control system.

Keywords: Mobile robots; Trajectory tracking; Teleoperation; Nonlinear systems