

Proportional control for trajectory tracking of a wheeled mobile robot

Abstract

The majority of the regulatory loops in the process industry use the proportional-integral-derivative (PID) controllers. PID controllers are widely used and there are various types of processes that regulate the PID controllers, because of this most extensive research have focused on analyzing the closed-loop stability, performance and robustness. This paper presents a new development for proportional parameter estimation in mobile robot for stable tracking control system. Proportional control parameters are decided by determining the minimal root mean square error (RMSE) of deviation in wheel rotations for the right wheel and the left wheel in the real environment. The selected minimal RMSE are use in the developed proportional controller which consists of two different system that are individually control the two D.C motors to generate the PWS (power wheel steering) of the mobile robot. The two system works concurrently with different value of proportional control parameters to perform stable movement in trajectory straight line tracking.

Keywords — Proportional controller, RMSE