

Development of a proportional control method for a mobile robot

Abstract

Proportional-integral-derivative (PID) control is a control strategy that has been successfully used over many years. Simplicity, robustness, a wide range of applicability and near-optimal performance are some of the reasons that have made PID control popular in the academic institutes and industries. This paper presents a new development of the proportional control method for stable tracking control system for a mobile robot. Proportional control parameters for each wheel are decided by confirmation of the minimal root mean square error (RMSE) of deviation in wheel rotations for each wheel. The accuracy performance was compared with the predictive nonlinear control method and the predictive proportional nonlinear control method. The experiment results demonstrated the feasibility and advantages of the proportional control on a trajectory tracking of a mobile robot.

Keywords — Proportional control, kinematic model, RMSE