Design of a differential-drive wheeled robot controller with pulse-width modulation

ABSTRACT

This paper presents mobile robots motion control technique based on pulse-width modulation (PWM). This technique is employed on AMiR which is an autonomous miniature robot for swarm robotic platform. That uses differential drive with a caster wheel configuration. Robotôs motors enable to work with different speed in different direction, forward and reverse. A microcontroller as the main processor is deployed to generate motor control pulses and manage duty-cycle of PWM signals. Two methods in robot trajectory control which are rotation and straight movement are described in this paper. Time estimation and also speed selection calculations illustrate the feasibility of this technique to be used in mobile robot motion control problem.