

CASCADE SLIDING MODE CONTROL OF A SPHERICAL WHEEL ROBOT DRIVEN BY OMNI WHEELS

黃崑書, 林友雄, 林國斌, 李柏坤, 黃啟光

Electrical Engineering

Engineering

bear@allbear.com

Abstract

The target of the paper is a spherical robot using Omni wheels to drive a spherical wheel, and its position control based on the cascade sliding model control (CSMC) has been studied. The structure of the CSMC is cascade combination of states of this dynamic model and a series of sliding surfaces. Because the CSMC is easy to result in a constant speed of spherical wheel, a constant without any switching cascade sliding model control, denoted as CSMC1, has been proposed to solve the undesired constant speed problem. The positive constant coefficients without any switching can release the body convergent rate, so the constant speed problem can be avoided to achieve the position control.

Keyword : Omni wheels; Spherical wheel; Cascade sliding mode control; Position control.