DEVELOPMENT OF A CONTROL MODEL FOR A FOUR WHEEL MECANUM VEHICLE

M. de Villiers[1] and N. S. Tlale[2]

[1] Council for Scientific and Industrial Research, Pretoria, South Africa

e-mail[1]: mfdevilliers@csir.co.za

e-mail[2]: ntlale@csir.co.za

ABSTRACT

In this paper, a refined control model for a Mecanum-wheeled mobile robot is developed and presented. Available control models in literature for Mecanum-wheeled mobile robots are based on a simplification which defines the contact point of the wheel on the ground as the point in the centre of the wheel, which does not vary. This limits the smoothness of motion of a mobile robot employing these wheels and impacts the efficiency of locomotion of mobile robots using Mecanum wheels. The control model proposed in this paper accounts for the fact that the contact point in fact changes position down the axle of the wheel as the angle roller moves on the ground. The developed control model is verified with experimental results. Using the refined model, control of Mecanum-wheeled mobile robot is made more more predictable and accurate.

Keywords: Mecanum wheel, Kinematics and Dynamics Modelling