



PRECISE TRANSHIPMENT CONTROL OF AN AUTOMATED MAGNETIC-GUIDED VEHICLE USING OPTICS POSITIONING

Xing Wu*, Peihuang Lou, Ke Shen, Guangqing Peng and Dunbing Tang

Nanjing University of Aeronautics and Astronautics

Jiangsu Key Laboratory of Precision and Micro-Manufacturing Technology

No.29, Yuedao Street, Nanjing, P. R. China

*Emails: Wustar5353@nuaa.edu.cn

Submitted: Sep. 30, 2013

Accepted: Feb. 10, 2014

Published: Mar. 1, 2014

Abstract- A parking position detection and control system is developed for precise transshipment of palletized materials between an automated guided vehicle (AGV) and a load transfer station. In order to align the roller conveyer of the AGV with that of the station, it is necessary for the AGV to detect the longitudinal, lateral and orientation deviations of its body with respect to the station. A pair of magnetic sensors is used to measure the lateral and orientation deviations of the AGV relative to a magnetic tape used as the guide-path. Fuzzy control is proposed to eliminate two deviations for path tracking that keeps the AGV on its path. A set of optics emitters and receivers is arranged on some specific points in the AGV and the station respectively to determine the longitudinal position for material transshipment, and to coordinate the transmission operation of two equipments. The experiment for the palletized materials transshipment shows that positioning control of our AGV parking system can achieve the accuracy, repeatability and reliability needed in industrial applications.

Index terms: Automated guided vehicle, magnetic guidance, optics positioning, parking control, cooperative transshipment.