

Vision-based Alignment Control for Mini Forklift System in Confine Area Operation

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Abstract:

This paper presents the proposed vision-based alignment control system for a Mini Heavy Loaded Forklift Autonomous Guided Vehicle (MHeLFAGV) in heavy copper spool picking process. This task has been divided into two parts; image processing for spool inspection and switching control input for MHeLFAGV alignment. In image processing part, a vision camera is used and programmed to do marking processing using Haarcascade method for spool center capturing. Vision will capture images in real-time then automatically analyzing for marking the targeted spool in 1000milisecond and continuously sending the coordination of between camera and the targeted spool. On the other hand, proposed alignment control system module is developed to translate the information from the camera to the mecanum wheel driven sequences in order move both Cartesian motions of MHeLFAGV, x, and y-axis to align this vehicle and its forklifter to be at the center of the copper spool. The indoor experiment was done on the MHeLFAGV system on detecting the targeted copper spool in front. The test validated the proposed vision-based control when vehicle able to appearing the target spool as input from the vision camera.

Keywords: Vision-based control, Real-time Haarcascade, Omnidirectional vehicle, confine area