PERANCANGAN DAN REALISASI ROBOT KRSBI BERODA
2017 MENGGUNAKAN SISTEM GERAK HOLONOMIC

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ABSTRAK


Kata Kunci : holonomic, mecanum drive, inverse kinematic
DESIGN AND REALIZATION OF KRSBI 2017 WHEELED ROBOT USING HOLONOMIC MOTION

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ABSTRACT

In Kontes Robot Sepak Bola Indonesia (KRSBI) division of Kontes Robot Indonesia 2017 Event, a robot needs to be able to play soccer in a field and get the ball into the enemy’s goal. Some problems that need to be solved are tuning and bad robot motion control. Other problem includes the configuration of conventional wheel, which inhibits the freedom of motion for the robot.

In this finals paper, three systems, including image processing system, motions system, and also dribbling and shoot system is designed into one system. The focus in this discussion is the movement system of the robot. To identify the ball used in the game, Thresholding method in image processing is used. The devices that are used here includes Logitech C930e Webcam and Lattepanda Single Board Computer powered by Intel Cherrytrail Z8300 processor. Holonomic motion system is implemented in the motion systems of the robot, with the help of mecanum drive to overcome problems related to robot motions. To create robot motions, such as forward, reverse, left, right, and diagonal direction, inverse kinematics formulae is used in order to enable the robot move without changing it’s orientation. In order to give input to the inverse kinematics formulae, rotary encoder sensor is used. Dribbling and shooting system adopts the crossbow mechanism which is combined with crank and slider mechanism.

Design and realization of holonomic motion system using mecanum drive is successfully done. Inverse Kinematics formulae can be used to determine motor speed needed. The rate of success of the robot to approach the ball reaches 40 to 100 %, excluding the scenario when the ball is directly at the back of the robot. Travelling time of the robot is lower when using mecanum wheel if compared to the conventional wheel.

Keyword: holonomic, mecanum drive, inverse kinematic
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