

Passive Drive Automatic Line Tracking Robot

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Objectives

1. Develop the robot to be participated in Robocon Competition 2016
2. Design the electronic circuits and mechanical structures
3. Develop the program to fulfill the requirements of the challenges



Robocon is an annual joint-universities robotic competition hosted by the Asia-Pacific Broadcasting Union (ABU). The theme of the contest this year is to design two robots, one Hybrid robot propelling the movement of another passively-driven Eco-robot. In this project, the development of the Eco-robot was concerned and an automatic line tracking system had been developed to guide the direction of that robot.

For the design of the Eco-robot, it is equipped with a sail, so that it can receive wind power from the wind turbine of the Hybrid robot and push the robot to move forward. A steering system is built to guide its movement. Four major systems have been developed on this robot, including the power system, line tracking system, steering system as well as the main control unit.

Line Tracking System

- Differentiate the white guiding line with other background colors
- Designed to work in polychrome environment
- Use of photodiode with RGB filters and color light-to-frequency converter



Steering System

- The steering of the wheels is controlled by a servo motor
- Able to make 90 degrees rotation to allow the robot to make sharp turns
- Steering angle is controlled by the main control board, and is depended on the read back value of the light sensors

Program Algorithm

- Obtain the color data from the color sensor array
- Calculate and determine the location of the white line
- Adjust the direction of the Eco-robot by controlling the steering system continuously

