

ABSTRACT

MiroSot Robot Soccer is a type of robot that can be used to participate in RoboCup contest. MiroSot Robot Soccer is a remote brainless robot that shaped in the form of a cube and its maximal size is $7.5 \times 7.5 \times 7.5 \text{ cm}^3$. Every robot has a marker, which is a combination of colour on the top surface of each robot. Vision system is important in this type of robot and this vision system is constantly developed. In vision system, how robot can recognize its own environment can be done with image processing, specifically object tracking. Object tracking method that can be used in this case is colour detection.

Vision system in this final project use colour detection method to discover coordinate position of each robot and their heading angle that can be obtained by processing robot id colour and team id colour on top of robot soccer surface using an algorithm. Visual studio and OpenCV library is used to execute this image processing program. A camera is placed on top of the robor soccer field and capture the frame that will be processed by the algorithm.

Vision system that created in this final project can detect the coordinate position and heading angle of MiroSot Robot Soccer using colour detection method. This system has a speed rate of 1/7.66 second/frame to process the detected object. In terms of calculating the exact position of the robot, the lowest accuracy percentage is 90.6% and the highest is 98.6%. The error value for the heading angle position of the robot is $3.85^\circ \pm 1.15^\circ$. This vision system can be applied to multiple robot soccer from the same team with the maximum distance from camera to robot soccer field is 2.5m.

Keyword: MiroSot Robot Soccer, image processing, colour detection