Inexpensive Image Processing Solution for the RoboCupJunior Soccer Scenario

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Abstract. It has been a while since image processing has been introduced to RoboCupJunior. Since then, computational power has become cheaper and tools have become more mature. It is time to evolve again. In this paper we present a simple and inexpensive system which is capable of processing images in real time and can provide information about the situation on the playing field and about the robot itself.
Inspired by many teams in the RoboCup Senior Soccer leagues which use similar image processing systems, we believe that it can serve as a framework for other RoboCupJunior teams who are trying to use more logic than force in their strategy.

Keywords: robot, image processing, RoboCupJunior Soccer

1   Introduction

The RoboCupJunior Soccer is being played on a field which resembles the football pitch that is being used in human soccer. Robots are required to fit into a cylinder 22 cm in diameter and 22 cm in height. Depending on the league, there is also a weight limit. As defined in the rules, total dimensions of this field are 182 cm by 243 cm [Rules].

Since 2009 the rules specify that "the interior walls and the cross-bar of each goal are painted, one goal yellow, the other goal blue. The exterior is painted black". Additionally, any interference that might happen with other robots is prevented ("Robots are not allowed to be coloured yellow or blue in order to avoid interference with the goal colour") as well as interference with the outer environment ("Any person close to the playing field is not allowed to wear any yellow or blue clothes that can be seen by the robots (to avoid interference with the goal colour)").

This set of rules allows for easy detection of the goal. Even though there still might be some interference from the environment (e.g. walls might be painted in yellow) we can expect it to be minor.