

The FUmanoid Vision System

In the RoboCup scenario, cameras are the most important sensors to perceive the environment. Therefore, the vision system has to serve good and reliable data (e.g. position of ball, goals, field lines) in a high frequency to the other modules.

The vision system can't build on modern object recognition approaches, because the use of very small low-cost processors forbids expensive calculations. To conquer these problems, the RoboCup rules describe a highly specified environment (yellow / blue goals, red ball) which lighten the object recognition. From year to year, the scenario gets more general, so that one day no specific colors or position markers will be used. For RoboCup 2010, the goal design was changed, so that a redevelopment of the vision system became necessary.

The new vision system uses edge features as well as the color information for cognition. The system has a hierarchic structure with two layers. In the lowest layer, the edge features are extracted from the image and combined with the color information provided by the color calibration. The object extraction layer uses these color-attributed edges and tries to combine them to the real objects.