# Goal-Keeper Robot for Mirosot Soccer Game

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Abstract

A typical autonomous mobile robot for a multi-agent robot soccer game would require sophisticated mechanical and electronic design, hence having high cost of individual robots. In a multi-agent platform and for product commercialization, cost optimization is required in order to facilitate reproduction of the design. Furthermore, in order to integrated robotics in the academic setting; keeping the prices down encourages students to be involved. In order to optimize the cost of individual robots typical design considerations will be replaced by cost optimizing alternatives. Typically, a customized robot frame from thermoplastic materials, microcontroller, semiconductor motor drivers, sophisticated sensors and software are required, but in our design we replace them with inexpensive alternatives. In our design, the following cost optimization techniques were implemented; a modified recycled thermoplastic chassis is used as frame, use of mechanical relays to replace semiconductor motor drivers, infrared emitters and sensors to replace typically used video camera for detection, discrete electronic devices such as logic gate integrated circuits which are generally inexpensive to replace the microcontroller. The test platform is the goal area of a FIRA Micro-Robot World Soccer Tournament (MiroSot) field. Preliminary design of the control circuitry is presented, and test results are tabulated. The performance showed very favorable results. The total cost of the goal-keeper robot is greatly reduced compare to the typical production cost.