

Team Description Paper

RoboCup WM 2008 Suzhou

Soccer Simulation League

Mixed Reality Competition

WF Wolves

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Abstract. This is the Team Description Paper of the WF Wolves, the RoboCup Team of the University of Applied Sciences Wolfenbüttel, for the RoboCup WorldCup 2008 in Suzhou.

1 Introduction

This team has been founded at the beginning of 2007 at this University of Applied Sciences. It took part in RoboCup the same year's summer, where it gained the fourth place in the Mixed Reality Competition. Besides the WF Wolves presented their soccer system at various events and fairs.

2 About the Team

This team currently has nine student team members. It is organized independently but is supported by various faculties: computer science, electrical engineering, mechanical engineering and supply.

3 Developments by this Team

The team participates in Hardware, Educational Games and Soccer Competitions.

* Thanks for supporting us.

3.1 Battery Charger for Bot Version 2007

We built battery chargers for both bot versions, which makes recharging them easier. New features of the charger for bot version 07:

- * New charging IC with several status displays (L6924D by ST) for: charging, full, error/rechargeable battery damaged. Each one features two LEDs.
- * USB powered for charging via USB port.
- * Recharging can still be done using a mains adaptor (6-12 V).
- * Very small size of the board, cell phone sized box .

The charge controller features a short circuit detection, which can prevent charging in case of short circuit.

Status LEDs Indications:

Charge condition	LED 1 (i.a. red)	LED 2 (i.a. green)
Charge in Progress	ON	OFF
Charge done	OFF	ON
Stand By mode	OFF	OFF
Battery absent or over time	ON	ON

3.2 Battery Charger for Bot Version 2008

Due to the positive results of the charge controller for version 07 we built another charger for version 08. We used the new Hirose plugs/sleeves, so charging works easily by attaching the robots.

The new robot version contains two rechargeable batteries each, which are recharged separately by two charge controllers. This is why each charging station has two separate pairs of status LEDs, which display: full, charging and damaged.

Another important point concerning the layout of the board is designing it in a way that offers enough space to attach and detach the robots. Charging via USB port is not possible with this charger, because sufficient current for six robots, i.e. twelve rechargeable batteries cannot be provided.

3.3 Programming Adaptor

We will also build a connection for the second bot version, which is planned to work quickly and reliably, so that new programs can be installed anytime.

3.4 Camera Software

We developed a software to connect a GigE camera with the server. GigE is a new standard of using Gigabit-Ethernet for connecting a camera to a Personal Computer. GigE cameras have high framerates at high resolutions and it's easy

to connect several cameras over the network without the need for much CPU power.

Until now there was only software for Windows available on the market. The WF Wolves designed and implemented a GigE Library for Linux which makes it possible to use GigE for everyone. The Wolves extended the Mixed Reality Soccer Server to support GigE cameras as it does support Fire-Cameras. The GigE Camera can exactly be used as the Fire-wire camera because it uses the same interface to the server. These improvements will help the mixed reality to get a bigger soccerfield for using eleven players on each side.

3.5 Swarm Intelligence

We are working on a swarm intelligence for the robots. It is supposed to make them act like a swarm, i.e. they will follow some typical rules similar to swarms of real animals:

- 1.They will never stop moving.
- 2.They will stay together closely.
- 3.They will search for food, which will be located in one special place.

If this works out correctly, we will integrate an enemy, who will drive them apart. Afterwards the robots should be able to recreate their formation.

3.6 Program Builder

We are programming an application, which allows the user to connect different funktions. Each funktion is graphically represented by a special symbol and can be inserted into the program agenda by drag-and-drop. After that the application can be run while the robot is receiving commands from the program.

3.7 Next Soccer Field

In terms of performing and display a match between teams consisting of eleven members each we will use a beamer to projekt the field on a glas screen. Its size will be 120 cm x 160 cm. Additionally we will observe the match with at least two cameras.