RoboCup Junior Rescue Robot Team AVR 2

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I. ABSTRACT—I WOULD LIKE TO PRESENT MY ROBOCUP-JUNIOR RESCUE SECONDARY TEAM FOCUSING ON EARLIER PARTICIPATION IN ROBOCUP AND THE TECHNICAL BACKGROUND.

Introduction

I live in Bremen which is in the northern part of Germany. Refering to the TDP of Team AVR 1, this new project was founded out of my inherent interest to improve the mechanic of the robot. Therefore I decided to build a new robot, while H. Schrader mainly competes with the old one.

CONSTRUCTION PHASE

Before I started to build a new robot I created a mechanical drawing using Coreldraw to have a better feeling for the new robot and the exact measurements to fullfill the RoboCup requirements.

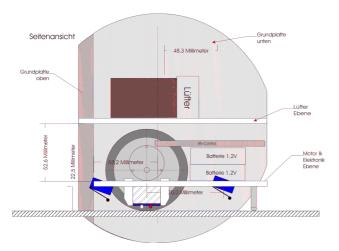


Abbildung 1: construction plan with ventilator

The new robot has several improvements and I would like to test it in a real competition being one reason why I want to compete at the Brazil Open.

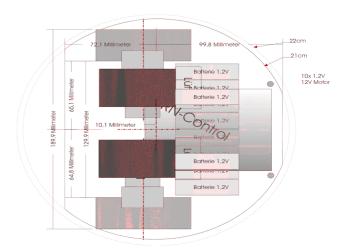


Abbildung 2: construction top view

During the phase of construction I made several "simulations" to optimize the sensors and their positions in order to avoid reconstruction during the testing of the robot. Remoenantage $\frac{1}{2}$

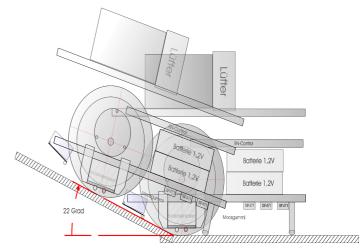


Abbildung 3: switch positoin at ramp start

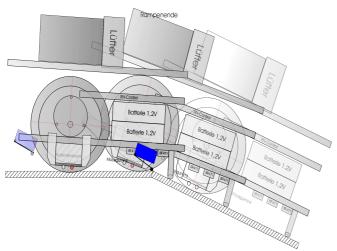


Abbildung 4: switch position at ramp end

BUILDING PHASE

The robot chassis mainly consists out of Forex, which is a lightweight polyster and is often used for trade fair constructions.

First of all I use 9 SFH309 instead of 5 in order to increase the percentage of victims being detected. I tried to install a ventilator in to blow the sticks in the Red Zone away, however it did not work perfectly and the robot would be oversized. The wheels are now positioned at the front size leading to the advantage that the sensor module is not laying on the ground anymore which caused trouble with the sticks formerly. There are several bumpers to detect both, the beginning and the end of the ramp and obstacles at the frontside as well as at the backside.

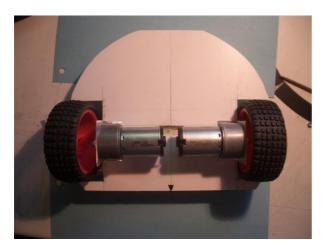


Abbildung 5: Ground plattform

The photos show robot and the ramp sensor. Moreover I added the schematic of the main board and the design drawing. The software is written in Bascom.

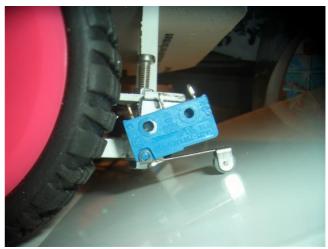


Abbildung 6: adjusting ramp start switch

As written before, during building the robot I fixed some construction problems, i.e. to have better center of gravity, the battery pack was moved in front of the motors.

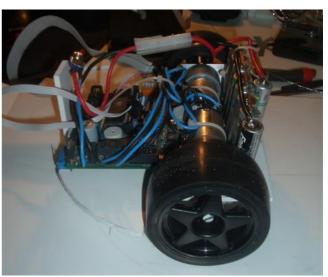


Abbildung 7 : assembled groundplattform with new battery position



Abbildung 8: Robot with ventilator

ELEKTRONIC

As described earlier I used more IR-sensors for line and victim detection. The mainboard is based on an ATMEL AVR 32 microcontroller. The IR-sensors and the mainboard communicate via an I2C-Bus and a self built interface board.

