Implementation of a vision system for a quadruped robot

Kurzbeschreibung / short description

A recently launched project at the ASL deals with the development of a fully autonomous quadruped robot. The goal of the given thesis is the implementation of an onboard color vision system in order to detect several objects on a football field.

Typ / type Semester’s Thesis
Partner ETH Zürich
Zeitdauer / period Winter/Summer semester
Student(en) / student(s) Fabian Seitz, Schwalbenstr. 132, 8623 Wetzikon, seitzf@ethz.ch
Betreuung intern / internal supervisor C. David Remy, cremy@ethz.ch
Betreuung extern / external supervisor

Stichworte / key words

Umfeld / context

In the Focus-Project “Laufroboter”, the mechanical structure for a quadrupedal robot, capable to play soccer, is developed according to the requirements of the RobotCup-Association. These include in detail:

• The platform should be modular, permitting upgrades and modifications from year to year.
• The new platform should have a sufficient number of degrees of freedom that teams can create interesting new behaviors and modes of locomotion.
• The robot is required to have onboard color vision.
• The robots are required to be fully autonomous. That is, they must have on-board computing resources sufficient to meet all processing requirements. No off-board computation is allowed.
• Onboard battery power must ensure that the robots require no recharge during a 30 minute game, and recharging should be as fast as possible.
• The robots must be capable of wireless 802.11 communications permitting the exchange of information between robots on the field.
• Ideally, the robot should be relatively small such that several can fit comfortably on one of the current RoboCup fields.
• Robots that are visually appealing will be looked upon favorably.

This project deals with the vision system of this robot.

Arbeitspakete / work packages

• Selection of a camera
• Development of the necessary algorithms
• Software implementation on an embedded system in C++
• Testing the complete system