



AIBO FIELD LOCALIZATION

ASSIGNMENT FOR THE PROJECT 'DESIGN AND ORGANIZATION OF AUTONOMOUS SYSTEMS'

VERSIE 0.4 – 13 DECEMBER 2004

INTRODUCTION

This document describes the goals for improvement of a system of soccer playing robots, developed for the four legged league of RoboCup. The basis of the project will be the software developed by the Dutch Aibo Team 2004, which was a part of the software of the German Team developed in 2003. In the four legged league all software is open-source. The Dutch Aibo Team could also have chosen a different basis for their developments. The decision for the Germans was made during last years project 'Design and Organization of Autonomous Systems' [1,2]. It was a good decision, because the German Team became World Champion in 2004.

The goal of the RoboCup Project is to let a robot soccer team win from a human team in 2050. For that reason every year the circumstances become more realistic. This year the Aibo have to be able to play on a larger field without boundaries [3]. It is the challenge for this year students to design and develop the algorithms to cope with this circumstances. Technically, the job will be focused on the modification and improvement the localization module.

a) Rules 2004: a field of 2.7 x 4.2 meter surrounded with low triangular walls.	b) Rules 2005: a field of 3.6 x 5.4 meter surrounded with a small green border.

The project will deliver a report that describes the design of the localization algorithm, and the measurements to estimate the reliability of this algorithm (favorably in comparison to alternative algorithms). The applicability of the algorithm will be demonstrated by playing a soccer game on the new field in the last week of the project. The modifications to the code will be documented on a website or a technical report. The documentation will also include clear, correct and working instructions on how to generate and use the software.

At the last day of the project the findings will be presented to the students of the course 'Design and Organization of Autonomous Systems'. The invitation of this mini-conference will also be given to interested members of the Dutch Team. This event is scheduled on Friday 7 February, 13:00-15:00.

TASKS TO PERFORM

The following tasks need to be performed. The team has to decide how these tasks are going to be divided. A planning with task assignments and milestone dates needs to be developed by the team, before the actual project tasks may start. A planning meeting will be schedule each week.

- Get sufficient machines to install and test the software, based on the planning and task assignments.
- Download the software and descriptions of the Dutch [4] and German Team [5].
- Install all required software, like Open-R, TCP-gateway and GameController.
- During installation make notes and a complete step-by- step instruction if these instructions are not available and make documentation that can be used by new team members or new student teams.
- Get familiar with the Aibo robot and some of it's demo programs.
- Install and test the Open-R demo programs [6].
- Install and test the existing Dutch Team code on the new field.
- Investigate what needs to be done to convert the existing software to the new circumstances and properly document the steps required for later reference.
- Setup a structure for the report and make each team member contribute to this report, based on the agreed planning.
- If possible, get the software running and report as much as possible about the findings.

SUGGESTED READING

The following documentation, available on the web, is suggested reading before the project starts:

- [1] Brammert Ottens, Aron Abbo, Peter Johan van der Meer and Manfred Stienstra: 'Aibo Project 2004 - German Team Report', University of Amsterdam, January 29, 2004.
<http://www.science.uva.nl/~arnoud/education/DOAS/2004/Project2004/FinalReport1.pdf>
- [2] Patrick de Oude, Tim van Erven, Jochem Liem, Tim van Kasteren: 'Evaluation of CMPack 2003', University of Amsterdam, January 29, 2004.
<http://www.science.uva.nl/~arnoud/education/DOAS/2004/Project2004/FinalReport2.pdf>
- [3] RoboCup Technical Committee: 'Sony Four Legged Football League Rule Book' (Foreseen Dec 1, 2005), <http://www.tzi.de/4legged/pub/Website/History/Rules2005.pdf>
- [4] Stijn Oomes et al: 'The Dutch Aibo Team 2004', downloads available at <http://aibo.cs.uu.nl/articles.htm> or <http://www.ph.tn.tudelft.nl/bscw> or uva@ugly.ph.tn.tudelft.nl/data/external/cvs/aibo
- [5] Thomas Röfer et al.: 'German Team – Robocup 2004'. <http://www.germanteam.org/GT2004.pdf>
- [6] Sony Cooperation: 'Open-R SDK University', <http://openr.aibo.com/openr/eng/perm/university.php4>

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