## Robot Companion for elderly care

### Introduction

In future many elderly people will have to stay longer in their homes, because the number of places in elderly homes and human care will be limited. Besides, that many elderly would like to stay longer in their home as long as a certain level of care could be guaranteed. Intelligent monitoring of the elderly is one of the options for that. When somebody falls, does not stand up or requires help, ambient intelligence in the house should detect accidents or health emergencies and take action like warning a care center. Besides the ambient intelligence in the house also a mobile interaction system is required with direct sensing of the person observed. The robot companion helps a person with the communication with the intelligent house and the communication with a care center when needed. This project is concerned with the development of such a mobile personal robot companion.

### Robot companion

A robot companion including sensing and interaction could have the shape of an artificial cat or dog like the AIBO ERS-7 [1].The AIBO dog is equipped with a colour camera, a left and right microphone, a small speaker and locomotion. It has a wireless connection which makes it possible to interact with the AIBO and to process remotely images and sound on a server. The AIBO is used in the RoboCup competitions [3] for which a wealth of software has been developed.

The AIBO should be able to follow a person, find a person based a motion and sound, interact with a person as robot assistant and detect when an accident has happed. It should be able to send images to a care center from which it should also be remotely controlled. This project should investigate the possibilities to use the AIBO dog as robot companion for elderly care.

### Tasks to perform

- Become familiar with the possibilities of the AIBO ERS-7
- Make a list of the possible tasks the AIBO has to perform as a personal assistant for this application and the requirements for these tasks.
- Search the WEB for available application software which could be used for those tasks
- Make a choice of a task which could be performed by the AIBO and implemented
- Install all required software, like Open-R[2]
- Setup a structure for the report and make each team member contribute to this report, based an agreed planning
- If possible, get the software running and report as much as possible about the results.

### References

[1] http://www.aibo-europe.com

[2] Sony Cooperation:'Open-R SDK University'
http://openr.aibo.com/openr/eng/index.php4

[3] RoboCup AIBO league
http://www.tzi.de/4legged/bin/view/Website/WebHome

# ERS-7 Specifications

| | |
|---|---|
| Dimension: | 180 (W) x 278 (H) x 319 (D) mm |
| Weight: | Approx. 1.65kg (including battery and memory stick) |
| CPU: | 64bit RISC Processor, MIPS R7000 |
| CPU Clock Speed: | 576MHz |
| Memory: | |
| SDRAM: | 64MB |
| Program Storage Media: | Memory Stick - 1 slot, FAT16 |
| Components: | not removable |
| Movable Parts: | Mouth - 1 degree of freedom<br>Head - 3 degrees of freedom<br>Leg - 3 degrees of freedom x 4 legs<br>Ear - 1 degree of freedom x 2<br>Tail - 2 degrees of freedom |
| Input/Output: | |
| - Camera: | CMOS Image Sensor 350,000 pixels |
| - PC Card Slot: | N/A |
| - Wireless LAN Card: | IEEE 802.11b (Integrated) |
| - Media: | Memory Stick slot In/Out |
| - Audio Input: | Miniature Microphones |
| - Audio Output: | Miniature Speaker, 20.8mm?500mW |
| - MIDI: | Yes |
| - Volume Switch: | Yes |
| Built-in Sensors: | Temperature Sensor<br>Infrared Distance Sensor (head, body) |

| | |
|---|---|
| | Acceleration Sensor<br>Electric Static Sensor (head, back)<br>Pressure Sensor (chin, paws (4)<br>Vibration Sensor |
| Power Consumption: | Approx. 7W (Standard operation in autonomous mode) |
| Operating Time: | Approx. 1.5 Hours (Standard operation in autonomous mode) |
| Charging Time: | Approx. 2.5 Hours |
| Operating Temperature: | 5°C to 35°C |
| Operating Humidity: | 10% to 80% |
| Supplied Accessories: | AIBO MIND (software), Energy station, Energy station, pole, AC adapter, Lithium Ion Battery pack, Pink ball, AIBOne, AIBO Cards, Documentation |
| LED: | |
| - Illume Face: | 24 LED (white 12, red 4, blue 4, green 4) |
| - Ear : | 2 (left and right) |
| - Head sensor : | 2 (white and amber) |
| - Head (wireless LAN on/off) : | 1(blue) |
| - Back sensor : | 16 (white 8, red 3, blue 3, orange 2) |