FINDING A GOAL AT THE OTHER SIDE OF THE FIELD

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(figure 1.)

Introduction

The goal of this assignment is to detect a goal using the upper camera of the Nao robot, and competing in the Robocup 2010 in Magedeburg.
The Nao robot is a soccer playing robot which is competing in the Standard Platform league of RoboCup. The Nao has two cameras, one on the top of his head, and one near the chin (see figure 1).
To get us started we used the code of a former winning team in the Robocup(" B-human, [coderelease](#)), where the Nao's are using bottom camera. The B-human team had their code documented in their [Team-Report](#).

Summery

At first we started reading the B-human Team-Report and Aldebaran Nao information. After that we started installing the needed software, and build the B-human code. We installed the standard software on a flashstick, and started connecting to the Nao. When we were able to connect we copied the b-human code on the flashstick. Now that the Nao was able to walk and look for the ball we wanted to be able to see what the Nao sees. Therefore we had to make the wireless connection work. With the wireless connection working we were able to see all JointData and Images of the Nao by connecting to the console. The only problem we had now is the field, we only had a AIBO field, so we made our own field with new carpet and tape.

When we were done with that, the Nao got overheated by two other students, and our flashstick was corrupted. We had to start all over again, by installing the software on a new flashstick. We were able to do that, and also configure the wireless connection. After that we changed the code in cameracalibration, the Nao should now look with top camera in stead of bottom camera. However we were not able to connect to the console anymore, so we could not see the images and JointData of the Nao. The Nao was using his bottom camera, because when we placed the ball in top camera sight, out of the bottom camera sight, the color of the eye changed to the "i have seen the ball color " (red). We were unable to get the console working before the robocup. Our Nao's were able to walk, but were not calibrated for the right colors, so they could not see the ball or the fieldlines.
We were able to get one tie in the tournament, and ended at the last place.

Log

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15 april

– Both robots have a running code, not tested with gamecontroller
– just before the game both memorysticks got corrupted: **always shutdown with shutdown -h now**
– My laptop crashed, had to reinstall ubuntu. Ran FlashAndinstall.sh again. Replaced a corrupted wpa.conf file, with a correct one.
– Updated the interfaces for the wireless to work again.
– Still cannot connect to console, tried editting the autoload.ini: added framemanager, devicecommunicationmanager, albase, alnetwork
– Still no succes, robots could not detect the ball, the goal or the field.

14 april

– robots still dont boot, we are waiting on Aldebaran
– tried to run the simulator to see if I could get cameracalibration working
– changed the fieldlines to fit the new rules
– When Bleu was fixed we did flashAndInstall, ran phase2, did copyfiles
– To see if we could connect to the console we needed to get wireless working
– To check the wireless configuration, test with /sbin/ifconfig wlan0.

– Modified /etc/network/interfaces. Restarted with /usr/sbin/wpa_supplicant -Dwext -i wlan0 -c/etc/wpa_supplicant.conf.

– Wireless is now working

13 april

- Downloaded Ubuntu, burned it on a cd, made my laptop dualboot
– Downloaded the needed packages to be able to run flashAndInstall.sh
– Downloaded the right image to run flashAndInstall.sh
– Was able to run flashAndInstall.sh successfully
– could net connect to robots to run phase2 or copyfiles because they are both broken

1 april

– flashed again → phase2 → copyfiles on other stick, Naoqi is running again, robot walking
– wireless not working yet so we could not check the images of the camera in the console to see if top camera was used.
– Nao did respond on ball with top camera!

25 februari

– did another flashAndInstall and copyfiles, the Nao is now up and running again, Arnoud fixed the wireless connection aswell
– We are still unable to connect to console for no reason, we get no errors or warnings.

10 februari

– in cameramatrixprovider we replaced all camera2 with camera 1
– we cannot check yet if this changed camera settings, because we are unable to connect to the b-human simulator

9 februari

– tried another flash and install on linux laptop
– We now got problems with copyfiles, have to debug, still errors
– tried copyfiles in parts, D:\svn\dnt\build\nao\linux\debugsettings.cfg and bhuman copied to media\userdata\config
– we have to use vvv to see what happens using commands.
– We can log in via CMD ssh root@192.168.0.84
– Build another time for release, in stead of debug, so its all on it.
– We are in phase 2 again
– Bleu is also working again, battery problems

25 January

– flashstick stopped working
– Again runned flashAndInstall on linux laptop, but still got problems connecting: possible to ping, but not able to connect with SSH

22 January

– we had to run flashAndInstall again on the linux laptop because our stick was destroyed.
– Reedited interfaces_template

18 January

– we set up the field for the robot to recognize
– robot stopped working, overheated

6 January

- we now know where the error comes from, we need a good field with goals so he robot can recognize it. We have to look for a new carpet.
- Camareacalibration seems to work, we are able to connect with everything just fine now.

3 December

- we are having problems with receiving jointData.
- Solved this problem by adding framemanager in the opt/naoqi/modules/bin/autoload.ini
- the german simulator can now show realtime data (vision and joint): dr representation:JointData on/ dr representation:Jointrequest on, for the Jointdata. For vision: vi image raw.
- Made a template to replay logfiles, called: logfileload.txt
- we found the error that is haunting us from start: regionpercept ->segmentcounter == 1000-1 failed.
- Error referes to: SVN/Dnt/Scr/Modules/Perception...

26 November

- tried to mae a log file, and replay it with the executor console, didn't work
- at the simrobot console it says: LOG: replaying logs\logfile.log, but we can't find where it happens
- tried to get some images from the Nao by telepathe, cannot connect.
- Logs are in var/log/
- to exit vi type: ":q"
- replaced nmap with netstat -l

19 November

– again we tried copyfiles.cmd released 192.168.0.80, this worked
– in secure shell: ./status, NaoQi is running, bhuman is running!
– Nao can now walk and kick a ball
– Nao gives an error, probably because he cannot recognize the field and surroundings
– We need a wireless connection to check out the log files, but we are unable to configure it. We tried in cygwin: ./switchactivewirelessconfig.sh -u wpa_supplicant.conf_robolab, which gives an error: failed to switch wireless network.
– In Simrobot Console: tried to load robocup scene, but the console tries to connect to 10.0.3.26, we haven't found where we can change that.
– In console: sc bleu 192.168.0.21, connected with Bleu: Hi, I am Bleu!
– In SSH we gave some commands, but Naoqi is not started anymore.
– Changed Wireless connection at interfaces_bleu to thcp, uploaded interfaces_bleu at secure file transfer etc/interfaces.
– Vi etc/network/interfaces, made it static 21 again, naoqi is starting again.
– Wireless connection is now up and running

12 November

- We ran Copyfiles in CMD: copyfiles.cmd Optimized 192.168.0.80 -p 1, this seems to work but gives one   error: there is no rule to create goal ' ../build/Nao/Linux/Debug/bhuman' , which is needed for   '../Build/remotecache/bhuman'
- used tar xvfz "file on cd linux NaoQi"
- Fixed an error with lalcommon by copying the Linux map from the CD
- Build the release
- We got a new error, cannot fiend ljpeg, solved it by copying the whole Util map from B-human code to the   svn map, some files were missing.
- We got some new errors: cannot update program database D:/svn/build/controller/win32/debug/vc90.pbd, unable to recover from previous errors.
- Solved errors by replacing vc90, could not edit it, so we made a new. Still some warnings at the simulator.
- Ran copyfiles.cmd released (in stead of Optimized) 192.168.0.80 -p 1, connection times out.

6 November

- We were able to remove warnings/errors from Visual studio by copying allmemoryproxy and allmemoryposthandler to the aldebaran/germen_code/util/alcommon.
- We still have one error remaining: can not find lalcommon. We think it has to be in /aldebaran/alcommon/lib/linux/, but there is no such map, we might need the linux laptop again.

5 November

- We used B. Terwijn's linux laptop to run FlashAndInstall.sh as root, on flash device /dev/sdc1: sudo ./flashAndInstall.sh -d /dev/sdc1 Bleu.
- We started using SVN, to log out: clear authentication data.
- Now we got problems connecting to the robot, configured wired connection to dhcp in install/files/interfaces_bleu.
- We could now connect to our robot using secure shell SSH.
- In visual Studios we added a new path: solution properties.
- We are now phase 2 with Bleu, ready to compile the code and copy it on the flash stick using copyfiles.
- We were not able to do this with linux, Visual studio is now running but we still got errors/warnings.
- Configured wireless network to robolab settings.

30 Oktober

- First we had to create our robot on a flash stick: createNewRobot.sh -t 0 -r 21 Bleu, and configured the wired robot's network.
- To get the b-human code on our Nao's flash stick we first had to download the OS Image v1.3.13.
- Now we could start the FlashAndInstall to get the code on the stick, therefore we had to remove the robot's head to get the stick out, and put it in the computer.
- We were not able to run FlashAndInstall.sh because we need to be "root".

29 Oktober

- Before we could start with our robots, we had to read the Team-Report of B-human and some basic information about the Nao's from Aldebaran.
- After that we installed Choreographe, Bonjour and Python 25.
- We unzipped the b-human coderelease in the cygwin shell with bunzip.

Interviews

Austian Kangaroos: Bernharth

Q: **When did you start programming you Nao's?**
A: We all started to program the Nao's together as a team, so I started at the same time as my team did. This was almost a year ago now.

Q: **How many robocups have you visited? /played in?**
A: This is our third, we've been to the World Championship and the Mediterranean Open before

Q: **What goals you set out to accomplice this robocup?**
A: Our goal was to have a robust system, not highly advanced but able to do all the basic stuff. Basically a system that would work.

Q: **What goals have you achieved?**
A: While we scored 0 goals so far our system has been working the entire time.

Q: **What improvements have you made this robocup?**
A: Well we managed to develop, test and implement the entire goalkeeper system. All we had when we got here was the dive algorithm. Now our goalkeeper knows when to dive and which way to block a ball successfully

Q: **What was your biggest problem with the Nao`s?**
A: Sometimes we had problems with the linux kernels where we couldn't start or stop a process anymore. This lead to having to reflash the stick we were working with.

Q: **What do you aim for in the near future?**
A: Some basic team coordination, make our robots more intelligent by giving them a better idea where they are, where the ball is and where the opponents are. And more team play in general.

Q: **If you could give us one top about robocup what shall that be?**
A: Talk to people, try to socialize

Bembelbots: Marcus

Q: How many robocups have you visited? /played in?
A: This is our first contest

Q: What goals you set out to accomplice this robocup?
A: Don't be last!

Q: What goals have you achieved?
A: Well were still in the game!

Q: What improvements have you made this robocup?
A: We came here with nearly nothing, here we have done a lot of work, our classifier works now and we can find and walk to the ball.

Q: What was your biggest problem with the Nao`s?
A: The light, it was hard to adjust our Nao`s to the brightness .

Q: What do you aim for in the near future?
A: Go to Singapore and score some goals there. See how it works there and take small steps

Q: Have u made any goals yet?
A: *laughs* , no.

Q: If you could give us one top about robocup what shall that be?
A: Have a fully working system before come here, and test it again and again and again on multiple Nao's. I don't even remember how many times we had to start over because 1 stick was working in 1 Nao and when we inserted into different Nao both the Nao and the stick stopped working. Or if we changed a tiny bit of code, the Nao`s just wouldn't boot anymore. Test, a lot!

Discussion

One of our problems is that we started with only one flashstick, we had no backup. This turned out to be our biggest mistake, since we were unable to make a working flashstick as our first one did.

We also found that the flashsticks of the Nao's are easily corrupted by taking them out of the Nao while the Nao was not correctly shut down (as the same flashstick without changes sometimes just did nothing).

At the robocup we found out that our team of three people was really small, for example when we had to referee the games, 2/3 of our team was gone and we were unable to make any progress on the code in that time.

Most teams at the robocup were composed of 3 Nao's, with only a minor working code. The Nao's had no teamwork and the two offensive Nao's were only in each others way. When there was just one working offensive Nao, it was a lot easier to get to the right position to shoot the ball.

Conclusion

The next time we are working on a project we have to make a backup of all the progress me make, because one mistake can ruin a 2 months work.

We also have to be a lot more careful with removing USB sticks, since we had to repeat our flashAndInstall a lot. We have to shutdown our Nao's with the "shutdown -h now" command in the SSH secure shell client

When we move on with the Nao's we are going to involve more students in our project, we already asked some classmates and they were very interested in working with the Nao's aswell.

Until we have a working code with teamwork, we will not use more than two Nao's in the field. Because the third Nao will only be in the way.