COM1005/2007 Lab 4: The NAO as Simple Reflex Agent

Objective: The objective of this lab is for you to see how you can make the NAO robot behave as a simple reflex agent (as discussed in Lecture 8). Along the way you should also learn more about how to program the Nao, using its graphical programming interface.

Background:
A simple reflex, or stimulus-response agent, chooses its actions based on the current percept only and ignores rest of its percept history.

Exercise

Your goal is to make the robot behave as follows:

1. The robot should wake up and go into the initial standing posture.
2. The Nao should ask you for your name.
3. If Nao is able to recognize your name it should say “Hello *your_name*”, otherwise it should just wave its hand.
4. Next, if the Nao spots the key words: “how are you” it should answer “Fine”.
5. Then if you say “goodbye”, the Nao should reply “goodbye” and wave its hand. But if nothing has been recognized it should loop and wait for you to say “goodbye”.
6. Finally, before ending the simulation the robot should crouch and rest in order to put it in a safe and stable position before ending.

Hints:

1. Consider both the Choice and Speech Recognition box libraries for speech recognition.
2. For both “recognition” boxes, by clicking on the wrench you can configure:
    - the words that the robot should look for.
    - the confidence threshold. Meaning that any word over this threshold will activate the blue colored output. Otherwise the bottom output is activated.
    - The visual expression, which is a display of led colors around the eyes and ears.
    - Finally, you should “enable word spotting”. If “word spotting” is disabled, the robot will expect you to say one word from the list alone. If “word spotting” is enabled the recognition engine will look for words from the list in a complete sentence.

More documentation on the NAO interface can be found at: Choregraphe Tutorials.

You should develop your program in Choregraphe. When you are confident you have it working, you should connect to your group robot and try the programme on the robot. When it works you should show it to a demonstrator who will record a mark for you.

Assessment

You will be awarded:

2 marks for demonstrating a program on the Nao that carries out the 6 steps above or for a program that executes correctly in Choreographe and runs partially on the Nao but where, e.g. the speech recognition fails and so not all parts of the program can be seen on the Nao.

1 mark for a program that does not correctly execute the 6 steps above, but executes a number of them in Choregraphe and/or on the NAO and is a reasonable effort towards solving the problem.

0 marks for failure to demonstrate anything or for a programme that only addresses a small number of the steps in the sequence above.

Deadline

Assignments will be assessed in the Lab sessions. You may of course work on Choregraphe outside of the lab sessions. The deadline for having your work assessed is as specified on the module home page and standard departmental penalties for lateness will be applied. If problems with gaining access to a robot delay assessment an alternative arrangement will be made.