Arduino based obstacle avoidance robot

Report Name	Progress Report
Author (User Id)	Daniel Atkinson (daa9)
Supervisor (User Id)	Dave Barnes (dpb)
Module	CS39440
Date	November 13, 2012
Revision	0.1
Status	Draft
Word Count	

Contents

1 Project Summary

1.1 Aim

The aim of the project is to build and program an autonomous robot that can move around freely within an environment and avoid coliding with obstacles it may find.

1.2 Background

I tend to experiment with electronic components on a regular basis. Due to this I try and make small systems and get them working, originaly nothing more than a simple timer or an audio amplifier. Naturaly the progression from this would be to move onto microcontrollers.
I like to see things move, it keeps my interest. The satisfaction I get when having started with nothing and going through to get something built and moving is what makes me think up new ideas, how can this be modified?, how can this be made better?. A robotic project the perfect thing for me to do.

2 Current Progress

2.1 Related Works

2.2 Technologies

2.2.1 Sensors

2.2.2 Actuators

2.2.3 Materials

2.3 Initial Learning

After choosing to use the arduino due to it having such a vast amount of support and examples I bought one and began to learn how to use it, using the arduino website itself as a guide (arduino.cc). On here there are many tutorials with circuit diagrams and example code on how to get the basics working, which I found very helpful.
The first things to learn were how to interact with the development board from my computer, then move onto getting it to output something. Making lights blink was easy, and communicating over a serial connection was also relatively easy. It got a bit harder when trying to recieve useful input from a sensor.
The first input I recieved was from an Infra Red sensor, using this to determine how far an object was from the sensor itself.

2.4 Prototype

2.5 Current Build

2.6 Utility

I put a small amount of time into building a portable device to interact with the main robot with main the purpose of reading live debug output. This device was thought of because following aroudn the prototype with a laptop plugged into it became very anoying and quite awkward because if the robot made a tight turn it could get tangled up in the cable.

3 Planning

Text in here.

Annotated Bibliography

[1] H. M. Dee and D. C. Hogg, "Navigational strategies in behaviour modelling," *Artificial Intelligence*, vol. 173(2), pp. 329–342, 2009.

This is my annotation. I should add in a description here.

[2] S. Duckworth, "A picture of a kitten at Hellifield Peel," http://www.geograph.org.uk/photo/640959, 2007, copyright Sylvia Duckworth and licensed for reuse under a Creative Commons Attribution-Share Alike 2.0 Generic Licence. Accessed August 2011.

This is my annotation. I should add in a description here.

[3] M. Neal, J. Feyereisl, R. Rascunà, and X. Wang, "Don't touch me, I'm fine: Robot autonomy using an artificial innate immune system," in *Proceedings of the 5th International Conference on Artificial Immune Systems*. Springer, 2006, pp. 349–361.

This paper...

[4] W. Press *et al.*, *Numerical recipes in C*. Cambridge University Press Cambridge, 1992, pp. 349–361, 0123456789.

This is my annotation. I can add in comments that are in **bold** and *italics and then other content.*

[5] Various, "Fail blog," http://www.failblog.org/, Aug. 2011, accessed August 2011.

This is my annotation. I should add in a description here.