System Design Project
Individual Report 1
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Introduction

The aim of this report to show my individual progress and achievements in Group 12. I am currently working in the sub-group Vision with Mr Biser Hong and Mr Behzad Tabibian.

Achievements to this day

I will follow my work from the my team's first meeting to the first milestone. When we first met, we decided to have sub-groups of three people to work on different aspects of the project. I decided to try my best with dealing with the “eyes” of the robot, i.e. the vision system. I made this decision mainly, because I believe I did not do good enough on a course last term called Introduction to Vision and Robotics.

Immediately after my group met, it was suggested to use one of the most popular tools – OpenCV. The programming language chosen is C. I do not have any experience with it, therefore this is a challenge I embrace. I started exploring OpenCV, as well as looking at some examples of object detection on the Internet. Moreover, I got a copy of the official book on the subject (Learning OpenCV: Computer Vision with the OpenCV Library), which proved to be very useful. I have already read the introductory chapters and a chapter on contour detection.

Our programme is working namely using contours to find the objects of interest. Those objects are filtered from a frame using appropriate colour thresholds. This method was agreed to be easiest and most reliable so far. Position is determined by getting the centre of a minimum rectangle that can be drawn around an object. Robot orientation was solved by my colleague, Mr Tabibian.

Mr Hong and I were gathering sample images for testing. This soon became insufficient. I managed to install OpenCV on my DICE account to proceed with testing of live video stream of the pitch.

There is still room for improvement of our code. Other approaches will be considered after testing what we have done, if the ones we have prove to be unreliable, inefficient or simply slow. Our team aims to find interesting ways to make the vision system exceptional and robust. We are currently testing a machine learning platform using the libraries provided by OpenCV.

Team Communication

My team has been meeting very often to keep the project going and organised. We have been communicating through our Facebook group and our wiki website. However, during those crucial first weeks of working together, we found some weaknesses, we need to sweep away as soon as possible. Firstly, anything other than pair programming proves to be hard to manage. In the Vision sub-group, we failed to distribute the work load evenly and the work pace was quite different between individuals. A part of the solution is writing quality code with comments and constantly maintaining a log of the progress of each team member on the webpage.