

Assignment - Coursework

by Jericho Uzzell

FILE	12014_JERICO_UZZELL_ASSIGNMENT_- _COURSEWORK_173939_1637855168.DOCX (651.8K)		
TIME SUBMITTED	04-MAY-2019 02:09AM (UTC+0100)	WORD COUNT	762
SUBMISSION ID	106303221	CHARACTER COUNT	3369

University of Wales Trinity Saint David

School of Engineering

Building the robot

Integrating Projects M4X01506

Jericho Uzzell

1702201

28/03/19



Prifysgol Cymru

Y Drindod Dewi Sant

University of Wales

Trinity Saint David

Introduction

We needed to build a robot that was independent to follow the given tasks that was placed in front of it. This report will go over the progression of the robot, problems we faced during development and how it did when tasked to do the work.

Looking at the task

The task that my group had was to make our robot go from point a to point b. The task was given to two people, part a was known as “following the line” and part b was known as “the maze”. I was tasked with following the line and Rizwan [1806547] was tasked with the maze.

Other tasks included the building of the robot of which was Osvaldas [1802408] job, Rizwan was tasked with the mathematics and the mechanics of the robot and I was the programmer – all members of the group had a go at programming and always gave input when I was programming, with that said I was the main person to program.

What I did

I did my job by having input from Osvaldas and Rizwan for what the robot would need to do in certain areas, and I would feedback to them the expected outcome from the robot, for example, whether if the robot would give the expected response to move something out of the way with a certain power or to go around it etc.

I preferred my job as the programmer because I have been coding for over six years, so I have a good understanding for if a task is possible and how I should do it. The program we were using was Lego Mindstorms EV3, according to Lego Mindstorms ^[1], “...using a combination of the EV3 Lab drag-and-drop interface and the untethered experience of a portable device”. This tells me that the drag and drop system is there to make development faster, the problem with this is that, I know what I wanted the robot to do in code but I could not implement that into the project as I was not comfortable with the icon feature.

When I needed help, almost all my help came from my lectures ^{[2] [3]} on how to use the program, I did not ask for help on how to do a certain task, only how to do it with the icons. This was difficult for me, because I am used to writing code instead of dragging and dropping loops and then knowing how to outputs etc.

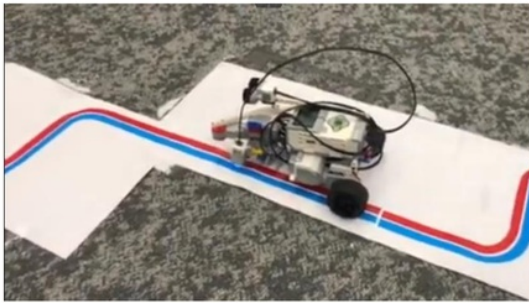
Overcoming problems

I did have some problems with programming the how to follow the line. This was when I was thinking, how would and should the robot deal with any colour apart from blue and red. For example, should the robot spin 360° if it is on white until it finds red or blue? Another problem we faced was the robot on carpet, whenever we would turn it would either oversteer or understeer due to the traction. We managed to fix this by adding another roller at the front of the robot which balanced the weight.

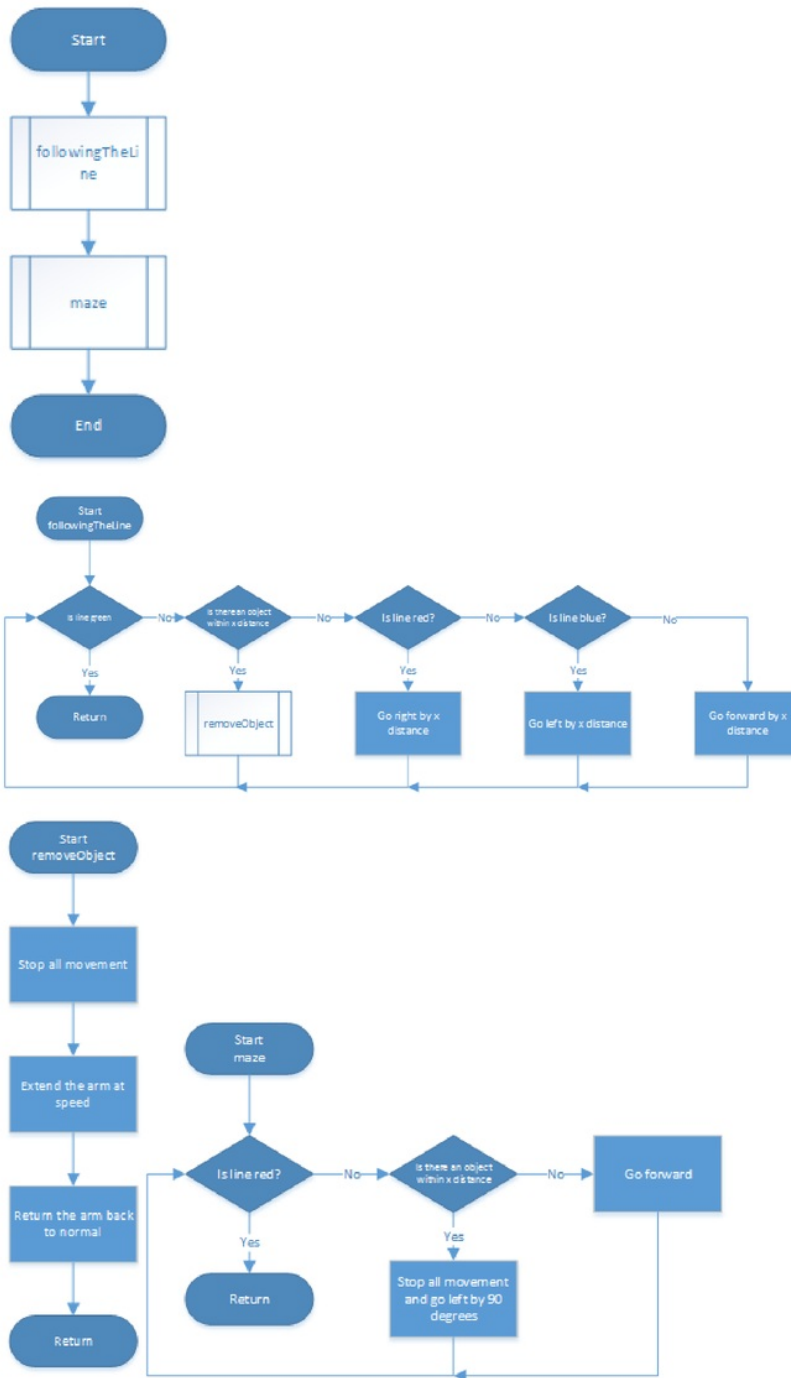
We also had to the problem with the maze, when the robot would get to a turn to go left, it would either oversteer/understeer due to the previous traction issue so due to this it would not accurately turn ninety degrees -- it would crash into the wall. Even with this, it should not have crashed due to the sensors. We initially thought it was the surface the robot was on but instead we resolved this issue with the extra ball on the front.

Doing the task

Whilst doing the task, the robot performed as expected because it followed the line at the desired speed, it responded well when an object was put in front of it by moving it out of the way. When it navigated the maze, my team was pleased as it did it with ease.



Flow chart



Conclusion

After reviewing my team's project and talking after the work was done. We know that we have done very well with the outcome in such that it had done its job spectacularly. We followed the flow charts as expected and the robot did its job in less than four minutes – no matter the time I do believe that we had done a good job on all accounts.

References

- [1] Lego Education, "Platform & Curriculum Compatibility", 2019, [Online]. Available: <https://education.lego.com/en-gb/support/mindstorms-ev3/compatibility>, [Accessed April 22, 2019]
- [2] G. Thomas, UWTSD 2019;
- [3] M. Abuhmida, UWTSD 2019;

Assignment - Coursework

GRADEMARK REPORT

FINAL GRADE

49/100

GENERAL COMMENTS

Instructor

Report (60%) overall: 27%

Introduction - 2/5

Introduction is very brief, it is a basic review of the task required. limited reference list and no i text citation.

Background research - 7/15

there is no enough evidence that the design decisions made are based on a research.

Project plan - 6/10

very limited and lacks a lot of the important information. you could use management information to enrich this section.

Design Process - 7/40

you could include the code blocks and used pseudo code to explain them. very brief discussion of the design process.

Evaluation and Results - 5/30

Demo (40%) - 83% overall

Technical knowledge/skill - 17/20

Analytical and problem-solving skills - 15/20

Quality of result - 51/60

Good negotiation of the corners at speed on the line follower. Obstacle is removed well. Maze negotiated successfully, but some adjustment to avoid close encounters with walls might be good from the side sensor so it would work with mazes of differing sizes - this would mitigate any problems with precision of turn.

Overall mark for module: 49%

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5
