Team 1 RobotExpress

Capabilities Document

Yutong Wang, Shichang Zhang, Junjian Chen, Linpei Duan, Lide Cui, Dominic Chan   ECSE 211

THE CAPABILITIES DOCUMENT

Project: Obstacle track-racer – A competitive robot design project
Task: Design and implement a working model out of EV3 Lego sets that would autonomously navigate to a racetrack on an island shown in the world map and complete as many laps as possible within the 5-minute time limit, eventually returning to its starting point.

Document Version Number: 2.0
Date: 15/04/2021
Responsible (usually Doc Manager): Dominic Chan, Yutong Wang

Edit History:

Version 1.0	06/03/2021	Dominic Chan, Yutong Wang	Completing the first version of the document.
Version 2.0	15/04/2021	Yutong Wang	Added section 4.1, updated the document with new roles of some team members

1.0 TABLE OF CONTENTS

2.0 TEAM MEMBERS

Angelina Duan:
- Project Manager
- Design Documentation Team member
- Software Team member
- Contact Points: lin.duan@mail.mcgill.ca

Yutong Wang:
- Hardware Team Leader
- Testing Team member
- Contact Point: yutong.wang2@mail.mcgill.ca

Shichang Zhang:
- Software Team Leader
- Hardware Team member
- Contact Point: shichang.zhang@mail.mcgill.ca

Junjian Chen:
- Testing Team Leader
- Software Team member
- Contact Point: junjian.chen2@mail.mcgill.ca

Lide Cui:
- Software Team Member
- Testing Team Member
- Contact Point: lids.cui@mail.mcgill.ca

Dominic Chan:
- Design Documentation Manager
- Testing Team member

Contact Point: dominic.chan2@mail.mcgill.ca

3.0 CAPABILITIES
The capabilities of each team member is shown in Table 1 below:

Team Member	Capabilities
Yutong Wang	- Majors in Electrical Engineering - Familiar with LeoCAD and Webots, can help with hardware design and testing - Have management experience - Comfortable with doing presentation - Communication with clients - Very little programming experience
Shichang Zhang	- Major in Computer Engineering - Comfortable with building hardware model using LeoCAD - Like to write codes and do the testing - Comfortable with doing presentation

	▪ Dislike writing reports and documents
Junjian Chen	● Major in Computer Engineering ● Loves to write software programs ● Familiar with coding and debugging ● Comfortable with testing robot ▪ Dislike working with documentations
Lide Cui	● Major in Software Engineering ● Comfortable with writing codes ● Comfortable with debugging ● Familiar with applications used in this course, and robot testing ▪ Not comfortable with report writing
Angelina Duan	● Major in Software Engineering ● Comfortable with reporting writing and working with documentation ● Comfortable with coding ● Love doing presentations ● Have management experiences ▪ Dislike debugging and testing robot
Dominic Chan	● Major in Electrical Engineering ● Comfortable with report writing ● Comfortable with debugging and robot testing ● Good with presentations ● Has organisation and management experiences ▪ Not comfortable with coding

Table 1: Capabilities of each team member

4.0 POSSIBLE APPLICATION AREAS

From table 1, it can be seen that the role of Hardware and Mechanical design would best suit Yutong and Shichang. Since both Yutong and Shichang are comfortable with the design and construction of robots in LeoCAD, in which they were also both responsible for the hardware design in their previous lab groups, they are hence more

proficient and comfortable in this area. In lab 5, their work and designs together have already proved valuable and effective for its success, so their experience and comfort with working together on hardware design makes this role suit them the most for the final project.

On the other hand, for software design, Lide would be best suited for the leadership role. In addition to the fact that he's very creative and quick-thinking, he has already taken many programming courses in Java and thus has extensive knowledge with coding and debugging efficiently. His teammates, Shichang, Junjian and Angelina are also very proficient with coding and debugging, and so they would prove to be invaluable in helping Lide code creatively and effectively.

Similarly, since testing and debugging is closely related to the success of software design, therefore, Junjian and Lide are best fit to lead the testing team, where they will be most adept at identifying and designing the tests needed for each step. Additionally, Dominic also plays an important role in the testing team due to his documentation, organisation, and data processing skills. Thus, he will be a major help in helping conduct the tests, and organising the entire process, as well as documenting the data and providing feedback.

With regard to documentation and report writing, the role of the design documentation manager would be most suitable for Dominic. Since Dominic has experience with management, organisation and formal writing, he would hence be efficient and effective in keeping track of documents, writing reports as well as helping manage the team.

Angelina is the Presentation Manager of our design team, where she will be responsible for managing all presentation and meeting related matters. Since she would also be closely working with Dominic in the design documentation team, she would be quite familiar with the ongoings between each sub-team, allowing her to be most suitable for organising and managing meetings with the client.

Lastly, Yutong is best suited to be the team manager, as not only is he organised, timely and punctual, he also has management experience and is comfortable with communicating with both his team and the clients. Thus, he would be most suited to manage the team as a whole and to make sure that tasks are completed correctly and on time.

However, even though we are all assigned different roles, we will still work together as a team and help one another whenever necessary, regardless of whether we're responsible for the work involved or not.

4.1 UPDATED ROLES

After we completed several tasks in this final project, some of the team members found what they are interested in and what they are good at, so we rearranged the roles of some team members.

Yutong Wang found that he was good at using LeoCAD to design the hardware model of robots. The robot used in Lab 5 was designed by Yutong and the robot was able to finish all the tasks smoothly. Since we received full marks for the Lab 5 demonstration using Yutong's robot and he is really interested in hardware design and testing, therefore we decided to let Yutong be the Hardware Team Leader.

Angelina Duan was selected as our Team Manager since she was the person arranging our weekly team meetings, and she also has management experience. Besides that, she is good at organizing, she made the initial version of Gantt Chart and Timesheet Spreadsheet documents and updated them every week. Therefore, she is best suited to be the Team Manager.

After a few weeks into the project, Shichang Zhang found that he was interested in software implementation and testing rather than hardware design. He worked together with Junjian and Lide as our software team, and the software implementation for lab 5 received full marks. Therefore, Shichang is assigned to be our Software Team Leader.

5.0 AVAILABILITY
The Table 2 below shows the important events of each team member and its corresponding dates.

Dominic Chan	● *ECSE 222 VHDL Project demo: Feb 26th* ● *ECSE 222 Midterm: Feb 22nd* ● *ECSE 206 Midterm: Feb 20th*
Shichang Zhang	● *ECSE 324 Midterm: Feb 22nd* ● *ECSE 206 Midterm: Feb 19th-Feb 20th* ● *ECSE 223 Deliverable 1 Deadline: Feb 19th* ● *ECSE 223 Deliverable 2 Deadline: Mar 12th* ● *ECSE 324 Lab2 Deadline: March 12th*
Junjian Chen	● *ECSE 324 Midterm: Feb 22nd* ● *ECSE 206 Midterm: Feb 19th-Feb 20th* ● *ECSE 223 Deliverable 1 Deadline: Feb 19th* ● *ECSE 223 Deliverable 2 Deadline: Mar 12th* ● *ECSE 324 Lab2 Deadline: March 12th*
Angelina Duan	● *ECSE 316 Midterm: Feb 26th* ● *ECSE 316 Code: Feb 22th* ● *COMP 360 Midterm: Feb 24th* ● *COMP 302 HW: Feb 25th* ● *COMP 302 Quiz: Feb 22th*
Yutong Wang	● *ECSE 307 Midterm: Feb 24th* ● *ECSE 308 Midterm: Mar 18th* ● *ECSE 324 Midterm: Feb 22th* ● *ECSE 324 Lab2 Deadline: March 12th*
Lide Cui	● *ECSE 316 Midterm: Feb 26th* ● *ECSE 316 Code: Feb 22th* ● *COMP 424 HW: Feb 22th* ● *COMP 424 Midterm: Feb 25th* ● *ECSE 310 midterm: Feb 20th*

6.0 GLOSSARY OF TERMS

LeoCAD: The CAD software used in ECSE211 to construct the Lego robots.

Webots: The simulation software used in ECSE211 to simulate the playing field and the robot.

Gantt Chart: Gantt Chart is a project management tool that is used extensively for the planning and scheduling tasks in a project.