LazyBots

McMaster University

Development Process and Implementation

SE 4GA6 & TRON 4TB6

Group 9

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1   Revisions

Table 1: Table of Revisions

Date	Revision Number	Authors	Comments
November 24th, 2017	Revision 0	Karim Guirguis David Hemms Marko Laban Curtis Milo Keyur Patel Alexandra Rahman	-

2   Version Control

Teammates are expected to use the private Github repository. Teammates will also be required to create new branches when developing different aspects of software and then merge them to the master branch when their functionality is stable. Multiple commits, including changes, are encouraged after any amount of changes greater then 1 module, or 50 lines of code by the entire team on different branches to allow the ability to revert back on changes.

3   Roles and Responsibilities

3.1   Karim Guirguis

- Working on the server based aspect of Alfred.

- Ensuring a proper logging system is in place.

- Assisting with the displacement software and the communication system for Alfred.

3.2   David Hemms

- Responsible for the server based aspect of the design.

- Ensuring a proper logging system is in place.

- Assisting with the navigation software.

3.3   Marko Laban

- Responsible for the design of the mechanical and electrical components of Alfred.

- Ensuring that all software components, such as navigation, displacement and ultrasonic sensors, are in place.

3.4   Curtis Milo

- Responsible for the design of the mechanical and electrical components of Alfred.

- Ensuring that all software components, such as navigation, displacement and ultrasonic sensors, are in place.

3.5   Keyur Patel

- Responsible for the mobile application and communication between said application and Alfred.

- Assisting with the administrative restaurant application.

3.6   Alexandra Rahman

- Responsible for all computer aided design models.

- Responsible for the administrative application between the restaurant staff and Alfred.

- Ensuring a proper error handler is in place for the sensor system.

4   Process Workflow

The following is a general outline of the workflow:

1. Pull any new changes from the master branch.

2. Create a new branch to develop on.

3. Create a detailed plan of the structure of the software. As well as create stub or driver methods/files for the new changes.

4. Implement the modules/functions that will not require the dependency of other modules.

5. Perform unit testing on the modules and functions.

6. Push any changes to the created branch.

7. Repeat steps 4 through 6with modules/functions that will depend on the previously created branch.

8. Merge new functionality with the Master branch after approval from another team member.

5   Details on Steps to be Taken

The following are steps to be taken:

1. Create models for CAD designs, using Inventor or SolidWorks.

2. Create mathematical models for the mechanical aspects of the robot.

3. Build base of robot including electrical components.

4. Build pumping system for robot and relevant electrical components.

5. Develop displacement system software with the Python IDE.

6. Develop the pumping system software with the Arduino environment.

7. Write REST API in server to allow communication, using Node developed in Visual Studio Code.

8. Write client application, including communication to server, using Java in Android Studio.

9. Implement navigation software for Alfred using Python on Python IDE.

10. Write administrator appication, including appropriate communication to server, using Javascript, in Visual Studio Code.

11. Create the error handling software for sensors using mixed development on Arduino environment and Python.

12. Implement communication between server and robot using REST API.

6   Development Tools

The following environments shall be used for the development and the debugging of the system:

- Visual Studio: Will be used for server and web based development.

- Chrome Expectation: Will be used for testing the communication of the server API.

- Python IDE: Will be used for the development of Alfred Navigation system. Debugging will be done by assessing internal variable variables and stepping through the logic of the code.

- Arduino IDE: Will be used for the development of the drink pumping system, debugging will be done using the built debugger, as well as stepping through the code.

- Android Studio: Will be used for development and debugging for the client facing application.

- Autodesk Inventor: Will be used when creating models for the mechanical aspects of the robot and to perform stress tests.

- SolidWorks: Will be used when creating models for the mechanical aspects of the robot.

- SimuLink: Will be used for simulation of the mathematical models of Alfred.

- Github: Will be used for version control and tracking issues within the code.

7   Handling Changes

1. Create an issue within the Github interface.

2. Create a new branch, if necessary, with the name of the change.

3. Change the software in question.

4. Perform unit testing to ensure the issue is still prevalent.

5. Perform regression testing to ensure that there are not any new issues that have appeared.

6. Merge to the Master branch.

7. Close the issue.