Development Process

Mechtron 4TB6 • Prof. Alan Wassyng

Group 34

Authors:

Ahmed Afifi

Abdulrahman Elgendy

Mina Ghaly

Omar Mouftah

Table Of Contents

1. Table Of Revisions

Version	Date	Authors	Description Of Revision
0	24/10/2021	Ahmed Afifi Abdulrahman Elgendy Mina Ghaly Omar Mouftah	Initial revision of the development process document

2. Roles And Responsibilities

2.1. Ahmed Afifi

- Assisting with the development of the Intellux system controller
- Responsible for modelling the designs of the Intellux apparatus
- Responsible for developing test scripts
- Assisting with prototype building

2.2. Abdulrahman Elgendy

- Responsible for the design and development of the Intellux system controller
- Working on sensor data processing and analysis
- Assisting with the motor control software

2.3. Mina Ghaly

- Responsible for the user database implementation and integration with the application
- Working on application front-end and back-end development
- Assisting with motor control software
- Assisting with application-apparatus integration

2.4. Omar Mouftah

- Responsible for application front-end and back-end development
- Responsible for application communication with apparatus
- Responsible for testing application functionality
- Assist with high-level apparatus design

3. Version Control

Version control will be maintained through the use of Github. Team members are expected to familiarize themselves with Github if they are not comfortable with it already. New branches will be created by team members when they wish to develop new functionality or features. Once the branches are completed, team members will create a pull request to be reviewed by the rest of the team members. Once approved, the branch will be merged into the master branch. Abdul will be in charge of maintaining the repo at https://github.com/abdul-gendy/Intellux. As for the CAD design, we will be using Fusion 360s built-in version control system. All models will be uploaded onto the team's repository and the updated versions will be visible alongside their editor.

4. Process Workflow

The general workflow for the project code is as follows:

1. Pull the latest version of the master branch from the Git repository
2. Create a local branch for the feature or task to be developed
    a. Branch must follow the naming convention issue_[issue number]_[issue title]
3. Complete any design or planning necessary for the task before commencing the implementation
4. Implement the proposed task
5. Run tests to ensure the feature/task is working as expected
6. Push the local branch to a remote branch
7. Merge remote branch to the master branch with approval from the master branch supervisor

For any 3D modeling, Autodesk Fusion 360 will be used for the built-in version control. The design of a new feature must start from the latest working version of the model.

5. Details On Steps To Be Taken

The following steps to be taken are:

Order:	Step:	Tool:	Responsibility
1	Research and source electronics to be included in the design	N/A	Ahmed & Abdul
2	Purchase all equipment needed for testing and building prototypes	N/A	Ahmed & Abdul & Mina
3	Create a CAD model of the casing based on the sourced components	Fusion 360	Ahmed & Omar
4	Develop the Intellux phone application Interface and Backend	Flutter SDK v2.5	Omar & Mina
5	Develop the source code for the apparatus on a Raspberry Pi	Python v3.9	Ahmed and Abdul
6	Create the error handling software	Python v3.9	Omar & Mina
7	Develop test scripts to validate the product	Python v3.9	Omar & Mina

6. Development Tools

The following tools will be used throughout the development process:

- Visual Studio Code: Will be used for application development
- GitHub: Will be used for version control
- Python IDE: Will be used design algorithms for the apparatus
- Flutter Framework: Will be used for application development
- Android Studio: Will be used to ensure that the application works on Android devices
- Xcode: Will be used to ensure the application works on iOS devices
- Fusion 360: Will be used to design a 3D model for the apparatus

7. Handling Changes

GitHub issues will be used to keep track of enhancements, and bugs for the Intellux GitHub repository. The following process will be followed by the Intellux team when handling changes:

1. Create a GitHub issue under the Intellux repository
    a. Ensure that the title and description clearly describe what the issue is about
    b. Make sure to add labels to every issue as it can help categorize issues and slice the team's work into manageable pieces
    c. Add an assignee to the issue who will be responsible for addressing it
2. Create a new branch for the assignee to work on the requested bug fixes/enhancements
    a. The branch name must start with the issue number to track the work being done to address the issue
    b. The text after the issue number is only to briefly refer to what the issue is about
    c. The branch must follow the naming convention issue_[issue number]_[issue title]
3. Implement the bug fix or feature enhancements on the newly created branch
4. Write some unit tests to ensure that the added functionality or bug fixes work as expected
    a. Make sure that all unit tests have passed before moving to Step 5
    b. If the code changes are not working as expected or require improvement they should be communicated earlier to the development team and get some help with Steps 3, 4
5. Perform integration testing to ensure that the several modules that make up the codebase still interact with each other as expected
    a. Make sure that all integration tests have passed before moving to Step 6
6. Perform regression testing to ensure that the added code has not introduced any new bugs to the system
    a. Make sure that all regression tests have passed before moving to Step 7
7. Create a pull request asking to merge the changes from the development branch to the master branch
    a. Assign at least one developer as a reviewer to review and approve the changes before they become a part of the main codebase
    b. Ensure the reviewer approves the code additions before moving to Step 8

   c. Depending on the reviewer's feedback, the assignee might need to go back to one of Steps 3, 4, 5, 6 and make some modifications/additions
8. Merge the reviewed pull request to the master branch
9. Close the issue