Software Engineering and Project

Group 2 *Coding Pharaohs*

MILESTONES draft for Week 9, Week 10, and Week 11

1 Milestone for Week 9

1.1 GUI features

1. Map editor redesign
    - The representation of the robot (indicate the facing direction)
    - Position the (0,0) point at the botom left rather than top left.
    - Larger scaled map than the previous one
    - Use tiles to present the map contents (Suggested by the client at the client meeting Week 7)
2. Real-time map generation
    - Present the current location of the robot
    - The newly explored area and objects will be presented on the GUI in real-time

1.2 The manual control of the robot

1. The user can manually control the robot to explore the map
2. Manually road closure marking

1.3 Safety performance

1. Movement speed
    - Provide a speed bar on the GUI to manually control the speed of the robot
    - The maximum speed should be within a safe value
    - The primary hypothesis setting for the speed is from 1cm/s to 5cm/s. This hypothesis needs further testing to verify. (It may change depending on the testing data.)

1.4 Map site testing designed by the group

1. A1 size map with basic features prepared by the group

2 Milestone for Week 10

2.1 GUI features

1. Present traversed path by the robot

    - Use a different colour on the map to display the traversed path by the robot

2. Machanism for the robot to get to the starting position on map

    - By clicking a button called “set location” to enable the “go-to-starting-position” mode of the robot, and click again to disable the mode after correctly set the starting position of the robot
    - Use mouse motion to drag the robot to the map (Suggested by the client at the client meeting Week 7)

2.2 AI mode of the robot

1. Automatically follow the road and explore uncleared area
2. Obstacle and disaster area avoidance
3. Automatically road closure marking
4. The robot has the ability to go back to the starting position in AI mode (Exit)

2.3 Safety performance

1. Collision detection. Once collision happens, the robot should stop immediately.

    Collisions include:

    - Hitting obstacles
    - Entering disaster zones
    - Off road
    - Out of map

2. Dangerous zone.

    - The robot should never go into the dangerous zone. Once it reaches the edge of the area, it will immediately stop.

2.4 Map site testing designed by the group

1. Put obstacles on the map and test

3 Milestone for Week 11

3.1 GUI features

1. Real-time messages on GUI

    - There will be a display field on the control panel of the GUI to show real-time messages sent by the robot.
    - The messages are going to report the status of the robot, including warnings and necessary values that the operator needs to know.

2. Zoom feature for the map

    There are two designated methods to implement this feature. The group will choose the better one depending on testing data.

    - Place a zoom bar under the map to control the size of display area on the map panel.
    - Place a smaller full view of the map beside main display of the map panel. The main display will show a certain sized part of the map. The user can drag the rectangle indicator in the full view map or use the scrolling bar to control the display area in the main display. (Suggested by the client at the client meeting Week 4)

3.2 Manual control mode features

1. Manual mode collision detection. Once collision happens, the robot should stop immediately against any manual command from the operator. The definitions for collision have been declared in the milestone for Week 10.

3.3 AI mode features

1. If the robot is forced to stop, it has the ability to continue the uncompleted AI mode exploration once the problems are solved.

3.4 Safety performance

1. Low power performance.

    - Send warning message to the operator when the battery has 20% life left.
    - If the battery has only 5% life left, the robot will immediately stop.

2. Lost of connection performance.

    - Stop, and once connected go to manual control mode.