

## **Robot Simulator**

The robot simulator is a video game. There are eight entities, some of them are mobile while the other are immobile. Six of these entities are immobile and they divide into two categories which are obstacles and recharge station. The number of the obstacles are five and they act as solid walls. The last immobile entity is the recharge station and its job recharges the robot battery. The other category is the mobile entities and there are two of them. They are a robot and a home base, and they are moving around. However, there are some difference between these two entities. The home base is moving around by itself and nobody effect on its move. Also, the heading angle of the home base is changing randomly.

The other one is the robot. It could be controlled by a user by using the arrow keys. The right and left arrow are to change the robot head angle while the up and down are to change the speed. The robot has a sensor to calculate the angle of contact during the movement. Moreover, the robot has a battery and it is depleting as the robot move. The depletion process depends on the speed and the distance. The battery level is printed on the screen under the robot. If the charge approaches 4.00, the speed of the robot will be 1 until the user recharges the robot again. Furthermore, if the charge approaches 0.00, that means the user loses the game and “YOU LOST THE GAME, Restart Again” will print on the screen under the battery level. So, the user needs to press restart button to play the game again.

To win the game, the user must hit the home base being out of charge. Furthermore, the user should avoid hitting the obstacles because if the robot bumps into obstacles, the speed will slow down, and the battery will deplete. If the user wins the game, “WOW, YOU WON THE GAME” will print on the screen under the robot and the home base and robot will stop moving.

If the user wants to stop playing the game for a while, he/she could press on “Pause” button and the game will stop. And, if he/she press “Play” button again, the same game will continue.

All drawing action is done in graphics\_arena\_viewer class while the color is done in color class. However, the arena class is responsible to check if the collision with the other entities happened to change the heading angle of the mobile entity or to win if the collision happened with the home base.