

MSI Experiment plans

The main goal of this experiment is to encourage students to pick engineering and computer science majors in the university. Therefore, the game should be attractive enough to get the student's attention and encourage them to learn more about engineering systems and behavioral control.

Components:

- 1- r-one Robots
- 2- The host robot
- 3- Controller

Controller:

This controller is responsible for controlling the robots in three tasks (behaviors): flocking, cluster and following. The controller has three bottoms and one joy stick. The user pushes a bottom to select the desired behavior, and then controls the motion of the leader robot by moving the joystick.

At first, the user starts the game (pushes the start bottom or reset bottom, moves the joystick...)

The controller runs four (five) following modes in the order:

Waiting Mode

In this mode, the lights of all bottoms are flushing, which shows the system is ready and waiting for the user to select a behavior

Behavior Unstable (Delay) Mode

As the user selects the behavior by pushing its bottom, the lights of other behaviors go off and the light of the selected behavior becomes pulsing. In order to make the system ready, the controller needs a delay between pushing the bottom by the user and the behavior becomes active. Therefore, the user cannot move the robots by using joystick until this time passes.

Behavior Active (stable) Mode

The behavior starts and the user can control the motion of the leader robot by moving the joystick forward, backward, left or right, the leader get the same command from the host robot which is connected to the controller and moves in the same direction that joystick is pushed. The other behavior will not be activated in this mode even if the user pushes the other bottom.

Behavior Switch:

After a specific time passes from Behavior Active mode, the controller switches to Behavior Switch. In this mode, the user either continues playing in the current mode or s/he can quit the current behavior and switch to other behaviors, the lights of all behavior bottoms are now flushing (similar to waiting mode)

Stop Mode (I suggest this mode in order to limit the time of playing for each user and to allow more people to play the game)

The game is over and all lights are off, the start/reset bottom becomes pulsing and the controller is ready to take a new user.