



# WPI

## Swarm Intelligence Homework 9

The aim of this homework is to make a script that allows a swarm of robots to diffuse in an environment while performing a synchronization algorithm.

First and foremost, install the Khepera IV plugin:

```
1 $ cd ~/WPI_SwarmIntelligence
2 $ git clone https://github.com/ilpincy/argos3-kheperaiv
3 $ cd argos3-kheperaiv
4 $ mkdir build
5 $ cd build
6 $ cmake -DCMAKE_BUILD_TYPE=RelWithDebInfo ../src
7 $ make -j12
8 $ sudo make install
```

### Obstacle Avoidance [50 points]

Avoiding obstacles is one of the most common behaviors. The aim of this exercise is to implement an obstacle avoidance strategy for your swarm. For this exercise, you'll use the proximity sensor and the robot wheels. See Figure 1 for a screenshot of the experiment and for a diagram of the eight infrared sensors.

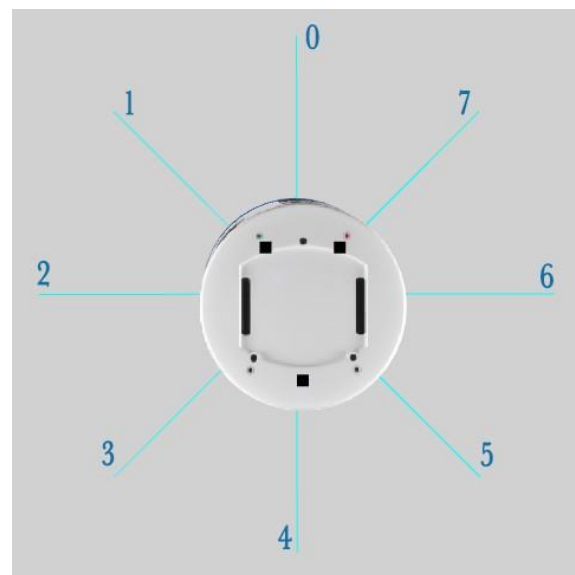
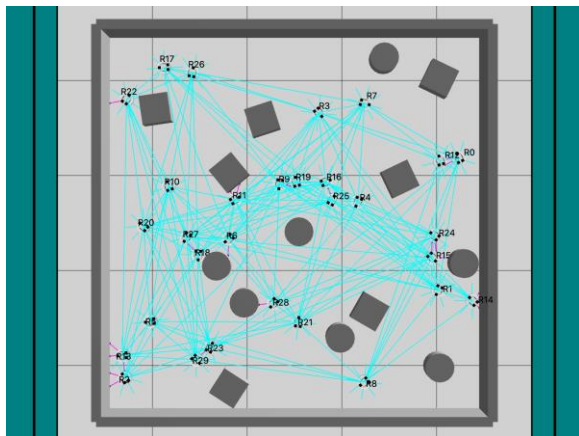


Figure 1: Proximity sensor labeling

## Synchronization [50 points]

Implement the same algorithm you had in HW6, but this time using the range-and-bearing communication system and the LEDs. Add your code to the same file you used to code obstacle avoidance.

## Execution Steps

```
1 $ unzip RBE511_HW9
2 $ cd RBE511_HW9
3 $ argos3 -c hw9.argos
```

This will open two windows: one is the ARGoS environment. the other is Buzz editor. In the Buzz editor, open the file with the buzz code (.bzz) and click Execute Script. After this, in the ARGoS window, press the Play button.

## Deliverables

The usual deliverable instructions: submit an archive called LastnameFirstname.zip with the following structure:

```
LastnameFirstname/  
Hw9.bzz  
<any other file you wrote that is required to execute your script>
```

## Buzz Resources

### Helpfullinks:

1. [Buzz wiki](#)
2. [Cheat sheet](#)
3. [ARGoS/Buzz integration](#)
4. [Khepera-specific commands](#)