Technical University of Crete
Electrical and Computer Engineering

Autonomous Agents
INF 412
2nd Laboratory Exercise
Report

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1. The purpose of the exercise

This laboratory exercise was designed with the intention of getting us familiar with the Webots simulator as well as the provided code and understanding how the Nao robots react to it.

2. Adjustments

The adjustments that are presented below were implemented in the provided code in order to make the E-puck robot follow the left all behavior with backwards movement.

2.1 Backwards Movement

The e-Puck moves by adjusting the rotational speed of its two wheels. The resulting behavior can be observed by the relationship between the left wheel speed and the right wheel speed. When they are equal, it corresponds to straight motion with positive values indicating forward movement and negative values indicating backward movement. When the left speed is greater it executes a right turn and when it's less than the right speed, a left turn.

So, in order to get the backwards movement I made the following adjustment to both Rat0.java and Rat1.java in **public void run().**

```
// Added negative(-) to make the robot work backwards.
    leftMotor.setVelocity(-0.00628 * leftSpeed);
    rightMotor.setVelocity(-0.00628 * rightSpeed);
```

2.2 Wall Following Behavior

Each one of the robots has a Wall Following behavior, Rat0 follows left-side walls and Rat1 follows right-side walls. Since they are moving backwards, the sensors used are 3, 4, 2(for Rat0), 5(for Rat1).

I tried to address the issues of having an obstacle in front of the robot, of being stuck in the corner and also of being close enough to the wall. I had trouble with finding the correct weights in order for it to work perfectly which is why sometimes the robots get stuck in corners and are not able to move.