

CMSC 143: Introduction to Object-Oriented Programming with Robots

Lab 1: Personal Robots

Due February 3, 2010

This lab introduces you to your robot, IDLE (the Python programming environment), and the wiki¹.

Learning Objectives

- Become familiar with the IPRE robot kit.
- Learn how to issue robot commands.
- Learn how to start IDLE and save programs.
- Learn how navigate the myro wiki.

Lab Report

Submit an electronic copy (PDF) on moodle of your lab report. It should be named `cmsc143_lab1_NAME.pdf` and include the following four sections.

Driving Your Robot

There a variety of ways to get your robot to move. The functions we will use most often are `forward()`, `backward()`, `turnLeft()`, and `turnRight()`. All these functions take a power value from -1 to 1, as well as an optional time parameter. If you don't use a time parameter the robot will go forward, backward, or turn, indefinitely (until a `stop()` or some other movement command is applied).

A more direct way to control the robot is by controlling each motor independently using the `motors()` function. The `motors` command takes two power values in the range $[-1, 1]$ for both the left and right wheels. Experiment with the `motors()` function. What values are needed to mimic the behavior of `forward()`, `backward()`, `turnLeft()`, and `turnRight()`? How can you use `motors` to make the robot follow an arc?

Calibration

Use the `calibrate()`² function to calibrate your robot's motors. How effective was the calibration?

Self Portrait

Use the robot's camera to take your picture and save it to a file using the following code snippet:

```
savePicture(takePicture(), 'me.jpg')
```

Scribbling

Use your robot to draw a square, a 5-point star, or another shape using (a) the gamepad and (b) a function you write, saved in a module. Along with your program, use your robot's camera to take pictures of both drawings and include those in your report. Write a paragraph reflecting on the differences between these two approaches.

¹<http://wiki.roboteducation.org>

²http://wiki.roboteducation.org/Chapter_2#Calibration:Making_Your_Robot_Go_Straight