

# CMSC 143: Introduction to Object-Oriented Programming with Robots

## Lab 1: Personal Robots

Due January 31, 2010

This lab introduces you to your robot, IDLE (the Python programming environment), and the wiki<sup>1</sup>.

### 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 named `cmsc143_lab1_LASTNAME.pdf`

### Getting to Know Your Robot

1. What COM port did you use to connect to your robot (keep in mind this will change often)?
2. What is the name of your robot?
3. What is your robot's battery voltage?

### 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. `motors()` 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()`<sup>2</sup> 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, write a paragraph reflecting on the differences between these two approaches.

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<sup>1</sup><http://wiki.roboteducation.org>

<sup>2</sup>[http://wiki.roboteducation.org/Chapter\\_2#Calibration:Making\\_Your\\_Robot\\_Go\\_Straight](http://wiki.roboteducation.org/Chapter_2#Calibration:Making_Your_Robot_Go_Straight)