# Acquiring Images


Image acquisition is the first stage of any vision system. It consists of the action of retrieving an image from some source (usually a camera device) and storing it in the computer for further processing.

In this course, a Kinect sensor is mounted on the Pioneer robot. This is a camera device that captures not only color but also *depth*. However, we are only going to use the color information.

In this notebook, you will move the robot around and learn how to capture and display an image.

First, as usual, we will initialize the robot.

In [1]:

```
import packages.initialization
import pioneer3dx as p3dx
p3dx.init()
```

Next, we need to import the plotting libraries for displaying the images.

In [2]:

```
%matplotlib inline
import matplotlib.pyplot as plt
# REMINDER: this cell may take some seconds to execute the first time
```

The motion GUI widget allows you to move the robot around.

In [3]:

```
import motion_widget
```

## Tilting

The Kinect sensor features a motorized tilt mechanism, which is capable of tilting the sensor up to 27º either up or down (approximately 0.47 radians).

The next GUI widget controls the tilt angle of the simulated Kinect.

In [4]:

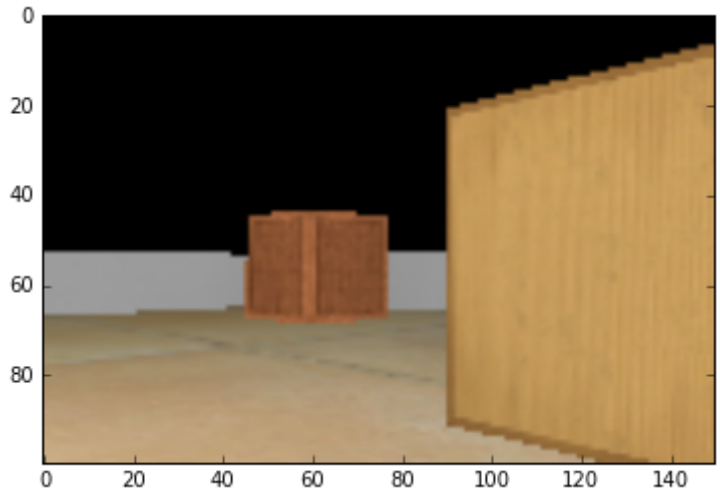
```
import tilt_widget
```

## Acquisition and Display

Finally, the image is automatically stored in a variable that can be passed to the image plot function:

In [5]:

```
plt.imshow(p3dx.image);    # Click here and press Shift+Enter to refresh the ima
ge
```




The image is stored as a numpy array (http://www.scipy-lectures.org/intro/numpy/array_object.html), which is very similar to a Matlab/Octave array.

For example, its dimensions can be obtained with:

In [6]:

```
p3dx.image.shape
```

Out[6]:

```
(100, 150, 4)
```

This result indicates that the image consists of 100 rows and 150 columns of RGBA (https://en.wikipedia.org/wiki/RGBA_color_space) pixels.

Next: Image Processing (Image%20Processing.ipynb)

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