

What is Roomba

- From Wikipedia, the free encyclopedia
- Roomba is a robotic vacuum cleaner made and sold by iRobot. As of May 2006, over 2 million units have been sold, making it the most successful domestic robot so far.
- Roombas contain an electronic and software interface that allows you to control or modify Roomba's behavior and remotely monitor its sensors. The iRobot Roomba Open Interface is intended for software programmers and roboticists to create their own enhancements to Roomba.

What can Roomba do

- **Actuators**
 - Move forward and backward turning left and right
 - Vacuum
 - Play MIDI notes, blink LEDs (one with intensity)
- **Sensors**
 - Bump sensor, Wall sensor (right), cliff sensors, virtual wall sensor, dirt detector
 - Distance sensor, wheel drop sensor, angle sensor, charging state, temperature, and more

How can it be programmed

- Serial Command Interface over Bluetooth
 - One byte commands send to serial port, possibly followed by argument bytes
 - Op code 142 + packet type byte fetches sensor values
 - Special commands for waking up Roomba etc.
- Can be programmed with any language that can read/write files (unbuffered)

What are we going to do with Roomba

- Maybe 2nd annual Roomba Race

<http://www.cs.helsinki.fi/group/cosco/Teaching/AI/2007/videos/roombafinal06.rm>

- Working in groups in our small Robo lab A235

- Links:

- Google Roomba, probably lot of information online

- Nice nontechnical intro in

- http://www.girr.org/random_stuff/roomba.html

- For programming, read

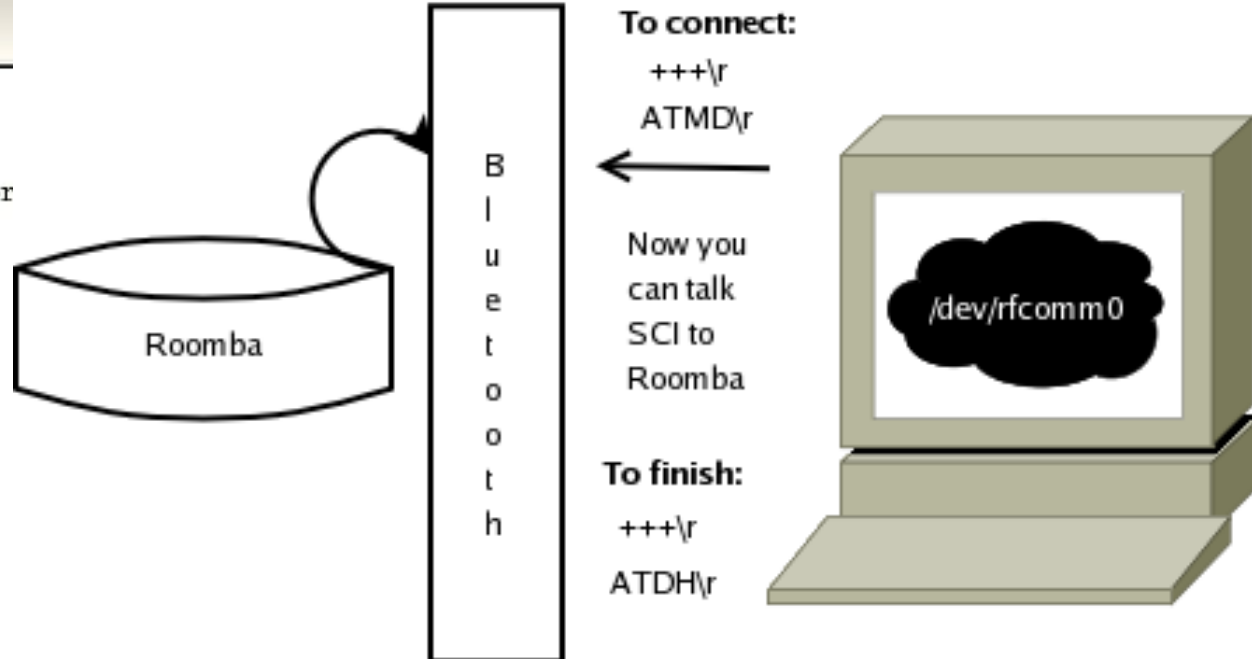
- http://www.irobot.com/images/consumer/hacker/Roomba_SCI_Spec_Manual.pdf

- first.

```

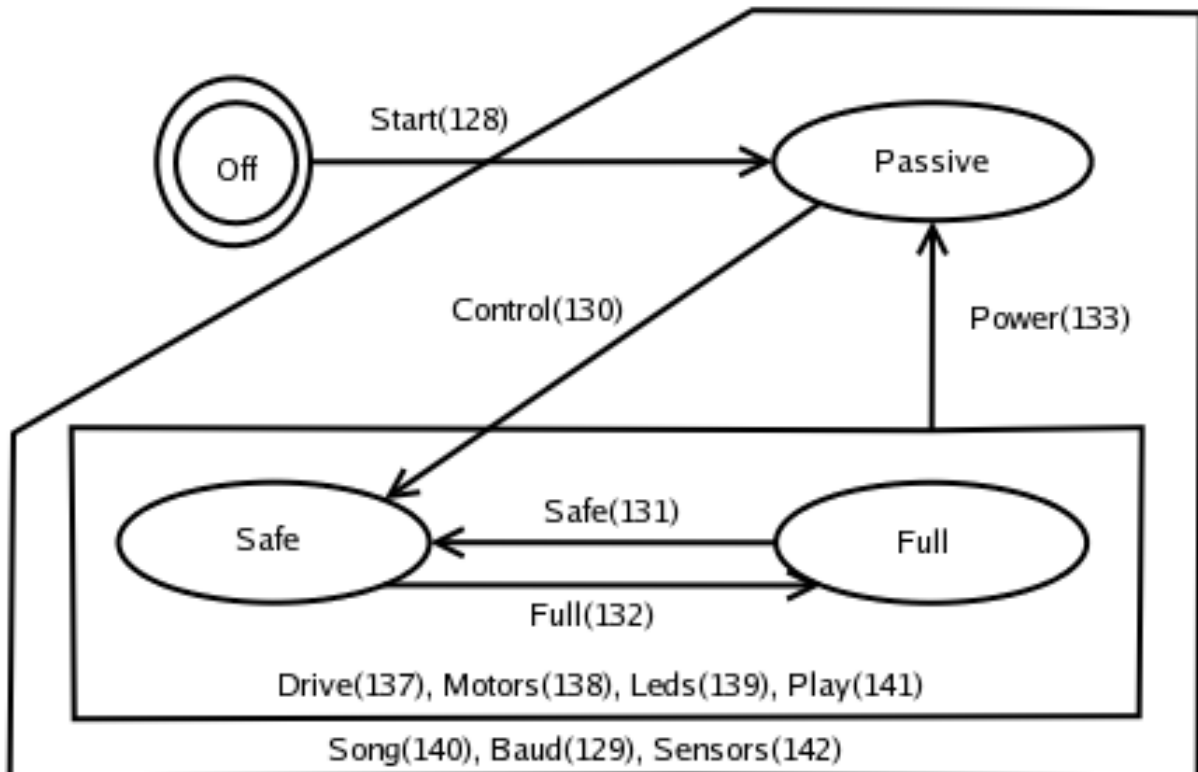
Session Edit View Bookmarks Settings Help
tsilande@wrl-69:~/roomba$ python
Python 2.4.3 (#1, Jun 13 2006, 11:46:08)
[GCC 4.1.1 20060525 (Red Hat 4.1.1-1)] on linux2
Type "help", "copyright", "credits" or "license" for mor
>>> import serial
>>> ser=serial.Serial("/dev/rfcomm0", timeout=0.1)
>>> ser.write("+++\\r")
>>> ser.readlines()
['\\r\\n', 'OK\\r\\n']
>>> ser.write("ATMD\\r")
>>> ser.readlines()
['\\r\\n', 'OK\\r\\n']
>>> ser.write("\\x80")
>>> ser.write("\\x82")
>>> ser.write("\\x89\\x00\\x14\\x80\\x00")
>>> ser.readlines()
[]
>>> ser.write("+++\\r")
>>> ser.readlines()
['\\r\\n', 'OK\\r\\n']
>>> ser.write("ATDH\\r")
>>> ser.readlines()
[]
>>> ser.close()
>>>
tsilande@wrl-69:~/roomba$ █

```



To reset Roomba for sure:

1. disconnect the Rootooth device from Roomba
2. remove the battery
3. reinstall the battery (be careful to insert it all the way)
4. reconnect the Rootooth device to Roomba's serial port.



```

import java.io.RandomAccessFile;
import java.lang.Thread;
import java.lang.InterruptedException;
import java.io.IOException;
import java.lang.String;

public class Tst {

    public static void main(String[] args)
        throws java.io.IOException, java.lang.InterruptedException
    {
        byte[] ans = new byte[6];
        RandomAccessFile f = new RandomAccessFile("/dev/rfcomm0", "rw");

        try {
            f.writeBytes("+++\\r"); // CONNECT TO BLUETOOTH
            Thread.sleep(1000);
            f.readFully(ans);
            System.out.print(new String(ans));

            f.writeBytes("ATMD\\r"); // CONNECT TO ROOMBA
            Thread.sleep(1000);
            f.readFully(ans);
            System.out.print(new String(ans));

            f.writeByte(128); // START
            Thread.sleep(100);

            f.writeByte(130); // CONTROL
            Thread.sleep(100);

```

```

        f.write("\\211\\000\\100\\200\\000".getBytes()); // DRIVE 100m
        Thread.sleep(100);

        byte[] sns = new byte[26];
        f.write("\\216\\000".getBytes()); // ASK FOR SENSORS
        Thread.sleep(500);

        f.read(sns); // READ SENSORS
        for(int i=0; i<26; ++i){
            System.out.print(sns[i]+" ");
        }
        System.out.println();

        Thread.sleep(3000); // WAIT

        f.write("\\211\\000\\000\\200\\000".getBytes()); // DRIVE 0mm
        Thread.sleep(100);

        f.writeBytes("+++\\r"); // BACK TO BLUETOOTH
        Thread.sleep(1000);

        f.writeBytes("ATDH\\r"); // DISCONNECT
        Thread.sleep(1000);

        } finally {
            if (f != null) {
                f.close();
            }
        }
    }
}

```