Bonus
EV3 Programming
Lessons

LEGO MINDSTORMS and Raspberry Pi Communicator

By Droids Robotics

Objectives

- Learn how to make the EV3 communicate with a Raspberry Pi

- **Prerequisites:**
  - *Must have basic Python programming knowledge*
  - *Must be comfortable using a Raspberry Pi (Unix/Linux commands & GPIO)*
  - *Must be familiar with EV3 Bluetooth Messaging*

Materials

- Raspberry Pi (Tested on Model B Edition 1 using Raspbian)
- EV3 brick
- USB Bluetooth (for the Raspberry Pi)

Step 1: Pi Setup

- Install software on the Raspberry Pi
  - *sudo apt-get update*
  - *sudo apt-get upgrade*
  - *sudo reboot*
  - *sudo apt-get install bluetooth bluez-utils blueman*

Step 2: Bluetooth EV3 to Pi

- Run *hcitool* scan to find the mac address of EV3 (will look something like this: 00:16:53:3F:2F:C3)
- Run *bluetooth-agent 1234 &* :proxy for entering passcode for ev3
- Run *sudo rfcomm connect /dev/rfcomm0 MAC_ADDRESS &* :to connect the ev3 (press enter if any message(s) appears on the screen)
  - *Replace MAC_ADDRESS with the Mac Address*
- If you are not returned to a terminal, try pressing “Return/Enter”. If that did not work you probably forgot the *&* symbol.

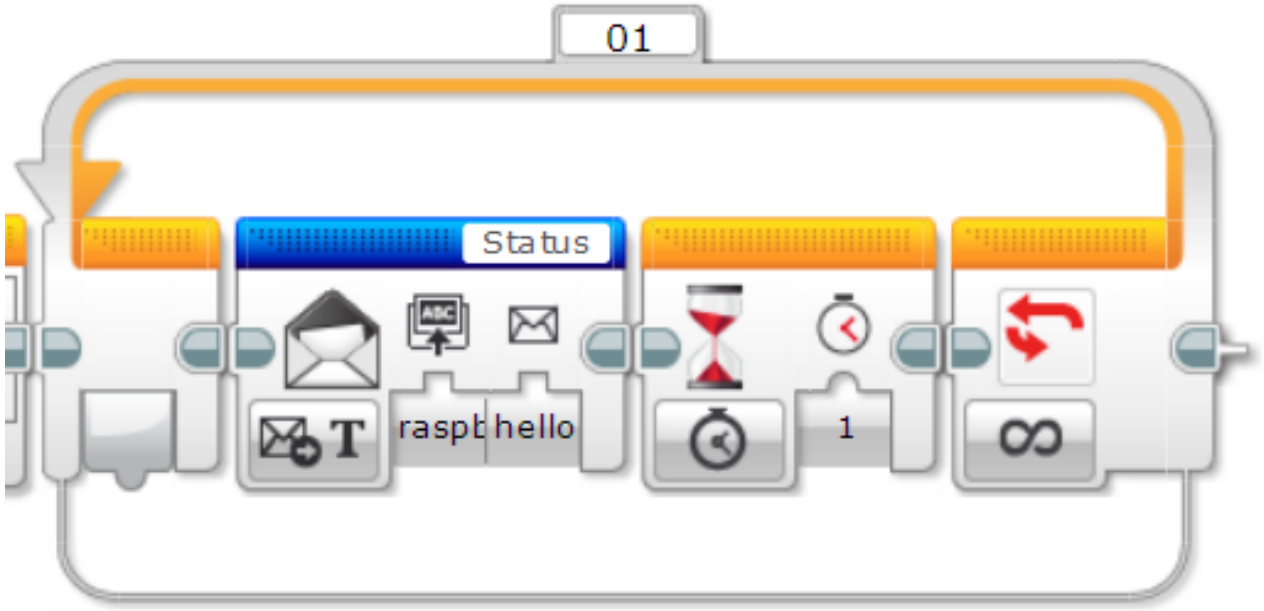
Step 3: Base Code

- Download Pi Base Code
  - *This code will decipher EV3 Bluetooth messages on the Pi*
  - *The code only deciphers text messages*

Challenge 1: Send a Message From the EV3 to the Pi

- Create EV3 test program to send “hello” to the name of your Pi
- Play the base code on the Pi and the code you made on the EV3.
  - *You should then see the message you sent on the Pi.*
- If there are errors that probably means that the Bluetooth is not connected properly

Challenge 1: Solution



Challenge 2: Run Actions Based on the EV3 Message

- Use Python to print “Hello EV3” if the EV3 message is “hi”
- Hint: to make the if statement work in this scenario you will need to use
  - `if 'hi' in message:` *instead of* `if message == 'hi':`
- You can use the base code to collect EV3 messages provided by EV3Lessons.com (See Slide 10)
  - *Be sure to read the comments to understand how the code works*
- Download solution code from EV3Lessons.com

CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan from Droids Robotics.
- More lessons are available at www.ev3lessons.com
- Author's Email: team@droidsrobotics.org
- Credits: gipprojects for the code to connect a Raspberry Pi to an EV3