Thymio Scratch interface tutorial

1 Introduction

The Thymio Scratch interface allows scratch to communicate with the Thymio robot so that commands and data can be exchanged. The interface can only be run on a Linux machine, so far the interface has been tested on Ubuntu 14.0.4 and Raspbian on the Raspberry Pi. The interface itself and Scratch do not need to be run on the same machine as long as both computers are on the same network.
This tutorial will cover setting up the interface and how to use Scratch to control the Thymio.

2 Linux notes

If you have never used the Linux terminal before then here are a list of common commands as well as useful commands. Please note that the terminal is case sensitive.
sudo: This commands runs the command as the root user. It is similar to the "run as administrator" option in windows. It is required for most commands which can make some modification to the computer and may require you to enter your password.
apt-get: This is the software manager for Ubuntu and Debian (Raspbian) distributions of Linux. It deals with installing, removing and managing software.
cd: This is used to change the directory that the terminal will use and is the same as in the windows console. This command is used with an address after it.
ls –a/ dir: These commands will list the current contents of the directory. Ls –a will include hidden files as well.

3 Fast Setup

There is a bash script which will install everything for you. If you want to learn about the UNIX terminal then you might want to follow the slow setup, otherwise this will do everything for you.
Firstly you need to download the actual program which will do the work. Go to the following link and click "download zip".
https://github.com/lazerduck/Thymio_python_interface
Now extract the files to somewhere convenient, for this example I will be using the desktop

Open the terminal with "ctrl + alt + T" and in the window you will need to navigate to the folder where you extracted the interface. In this example I use the desktop, refer to the Linux notes section for the commands for navigating using the terminal.

```
cd /home/<your_username>/Desktop/Thymio_python_interface-master
```

Now we need to ensure the file has the permissions to run, enter the following.

```
sudo chmod +x Install.sh
```

With that done you need to run the script, enter the following .

```
./Install.sh
```

And now everything has been install.

4 Running the Interface

You are now ready to set up the interface. This will describe how to setup the interface tethered to the computer. For remote connections you will need to connect the interface to Scratch on the other computer, section 4.x will cover this in greater detail.

4.1 Run the Required Programs

For the interface to communicate with Scratch and the Thymio they will need to be running. **Connect the Thymio via USB to the computer** and enter the following command to run Asebamedulla and make it connect to the Thymio.

```
sudo asebamedulla "ser:name=Thymio-II"
```

If this doesn't work, try it without the speech marks.

Now the terminal should say that it has connected to the Thymio. If this is not the case, press "ctrl + C" to stop Asebamedulla from running and try again.

Open Scratch, it should appear in the start menu or on the desktop. Use scratch to open the Scratch file in the previously extracted files as mentioned in 3.3. It should be called **"Thymio-test.sb".** The Scratch code should now load and there should be a box saying "remote sensor connections enabled", press okay. There will be code on the cat sprite and on the stage. The code on the cat is example code and the code in the stage is the back end code that performs some simple actions to ensure sensor data is available.

4.2 Run the Interface

You are now ready to run the interface. **Open another terminal window** as the current one is still running Asebamedulla. In the new terminal window you will need to navigate to the folder where you extracted the interface. In this example I use the desktop, refer to the Linux notes section for the commands for navigating using the terminal.

```
cd /home/pi/Desktop/Thymio_python_interface-master
```

In this example, pi is the username and the desktop is where the folder is, **you may need to change this to match your system**. Now that the terminal is looking in the right folder you can run the interface. Enter the following in to the terminal

```
sudo python Thymio_Interface.py
```

It should now ask you what sensors you want to use, just say yes to all 3. Finally it will ask you for the address of the computer running Scratch. As we are running Scratch on the

same machine you can just enter “localhost” without the quote marks. Localhost refers to the address of the current machine.

If you come across an error saying
“dbus.exceptions.DBusException: org.freedesktop.DBus.Error.ServiceUnknown: The name ch.epfl.mobots.Aseba was not provided by any .service files”
Then the interface couldn’t find Asebamedulla. Switch to the terminal running Asebamedulla and stop the program and start it running again.
If you see a line saying “sensor update” then everything is working and you are ready to move on to the tasks.

4.3 Remote connections

To use another machine to run Scratch you will need to run Scratch on that machine and open the scratch file just like before. When running the interface instead of entering localhost as the address of scratch enter the local IP of the computer running Scratch.

A remote connection is intended so that a Raspberry Pi with a battery pack can be put on the Thymio and use Wi-Fi to allow you to control it from a distance and with no trailing wires.