

Iot

Internet of Things
(internet of
everything?)

Learning Objectives

Get an idea of what IoT is

Get an overview of the course

Learn the very basics of linux / RPi

Learn the very basics of python - among other PyCharm

Be able to write simple python programs to control a RPi's GPIO, to make a robot walk, read from web camera and other sensors

Be able to document and present your work

Today's Agenda

Some Introduction to IoT - What is it?

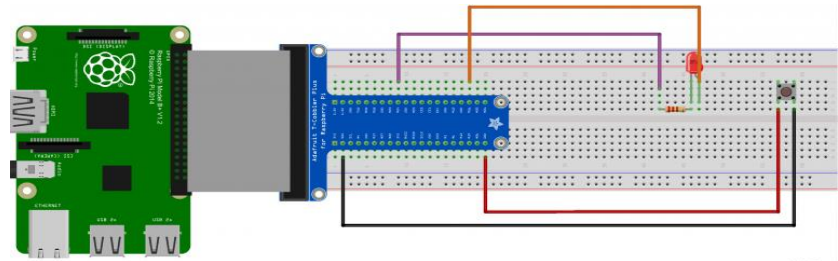
Introduction to Raspberry Pi - What to expect?

Basic linux commands - navigate in the console and other basic operations

A simple program to control a LED - learn how to wire the pins of the RPi

Near future

- Adding a button to our RPi - a slightly more complete exercise
- Python Exercise - Improve on your python skills...



Course overview

5 weeks: Introduction to IOT, Python, Linux and sensors

- Small exercises and training in electronics and python programming

3 weeks: Mandatory Project: An IoT device

- More exercises and introducing new sensors, displays, inputs etc
- Work on IoT project in groups
- Documenting your device – for www.dimselab.dk
- Demonstrate / Presentation of your device

2 weeks of Mandatory presentation : Present a paper / article

- 10 min Presentation for the class

5 weeks of Specialization

- Guidance on your specialization

Mandatory Project

You have to build an IoT device for the ??? in groups of two- three members.

Your device can be almost anything as long as it reflects the course and can be used in ?<coming>?

Ideas for your mandatory could be:

- Game battle between robots
- Intelligent decoration
- Monitoring ...
- ...

Specialization

For exam you have to do a specialization

- You choose a topic from one of your elective courses
- You get guidance
- You write a paper (8 pages)
- You go to an oral exam in your chosen topic

Mandatory Project

Your IoT device must be extensively described in details on the IoT blog (www.dimselab.dk). Your blog post must include:

- Names of everyone in the group
- Description of the device's purpose
- Description of how you came up with the idea
- Description of how you created the device
- Fritzing diagram describing your wiring
- The code you wrote to make it work
- Pictures showing your device in use

so... What is this internet-of-
things?

Some definitions

The Internet of Things (IoT) is the network of physical objects, devices, vehicles, buildings and other items which are embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

[\[Wikipedia\]](#)

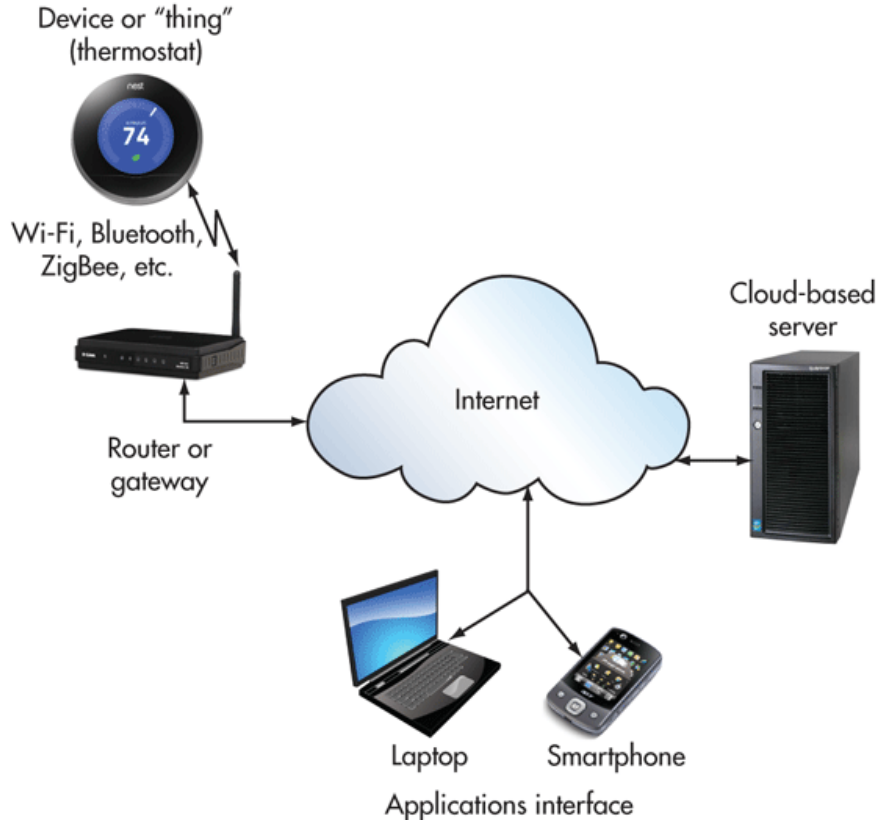
The Internet of Things (IoT) is an environment in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

[\[techTarget.com\]](http://techTarget.com)

Internet of things



Get Connected



Some examples:

IBM + ISS Smarter Building :

https://www.youtube.com/watch?v=mkOC_rRhMOw

Introduction to Lora

<https://www.lora-alliance.org/What-Is-LoRa/LoRaWAN-Videos>



exercise

Find your favourite IoT device and tell us why

Raspberry Pi

Small computer – though not as small as other IoT's

Can run different OS's

- most often Linux – **Raspbian** a Debian variant, but also **Windows 10**, **Ubuntu**, **osmc**, **risk os**

Competing to Arduino

Have All kind of plugs (HDMI,RJ45,USB,micro SD ...)

- besides all the pins



What is python

High level Language

general purpose

Interpreted

Interactive

Object Oriented

Clear syntax

Modules Libraries

Portable

Interpreter directly

Interpreter shell

IDE to python

Nano, PyCharm (JetBrains)

The End / Evaluation

Did things go as expected?