Python in a physics lab

Gergely Imreh

PyCon Taiwan
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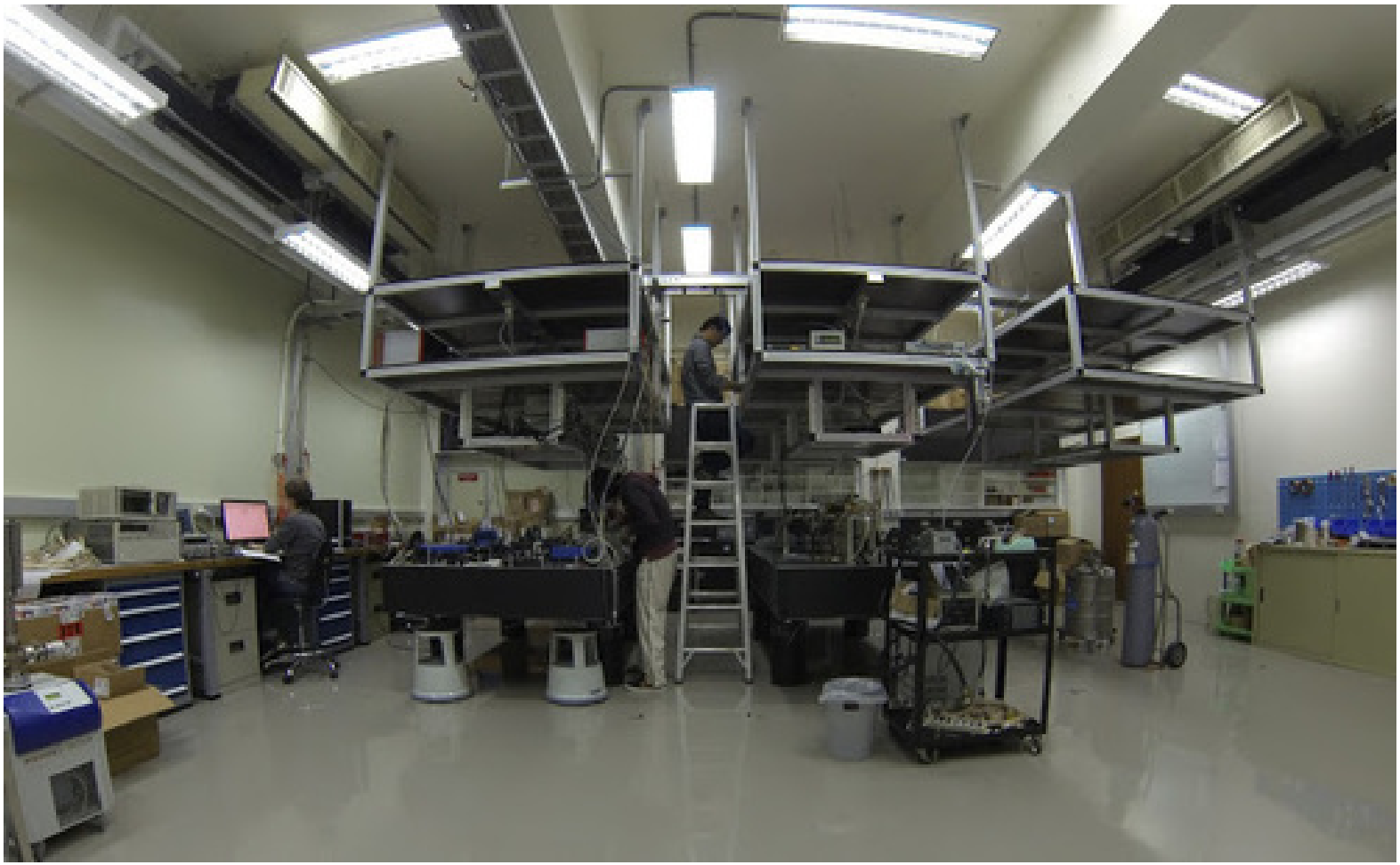
Lab overview



Experiment X

Laundry list of an experiment

- Planning and theory
- Instrument control
- Interface
- Analysis and archiving

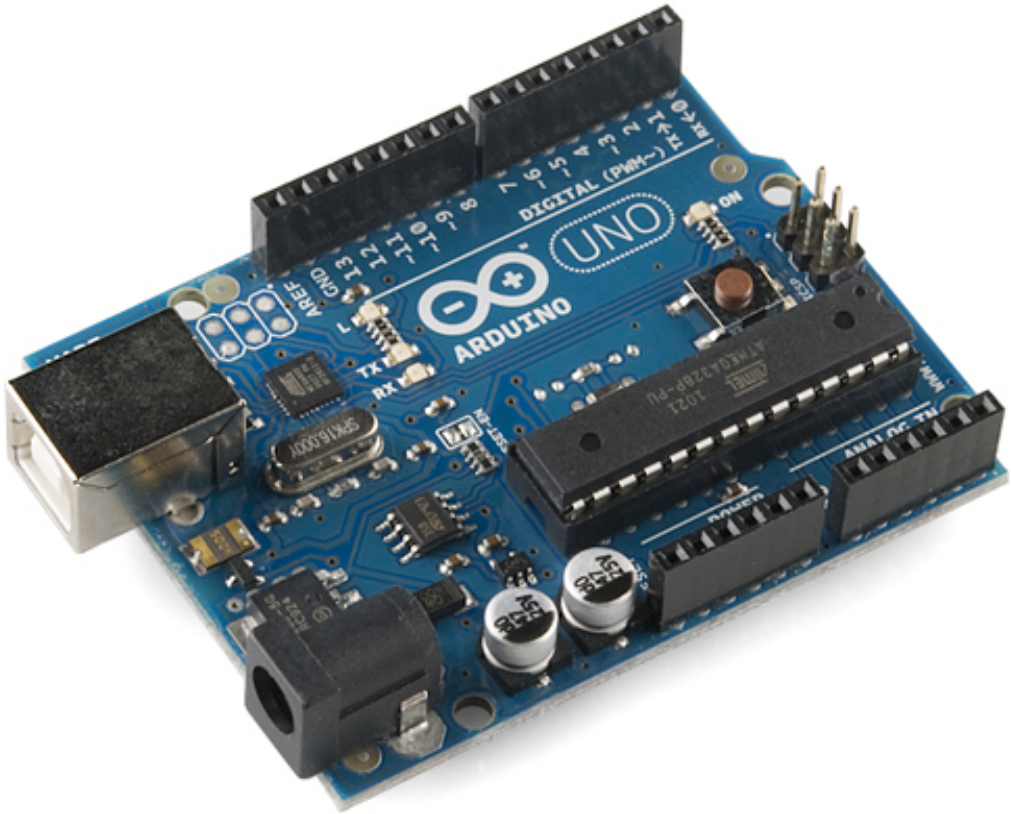
Theory

Tools of theory:

multiprocessing

RS-232 Serial

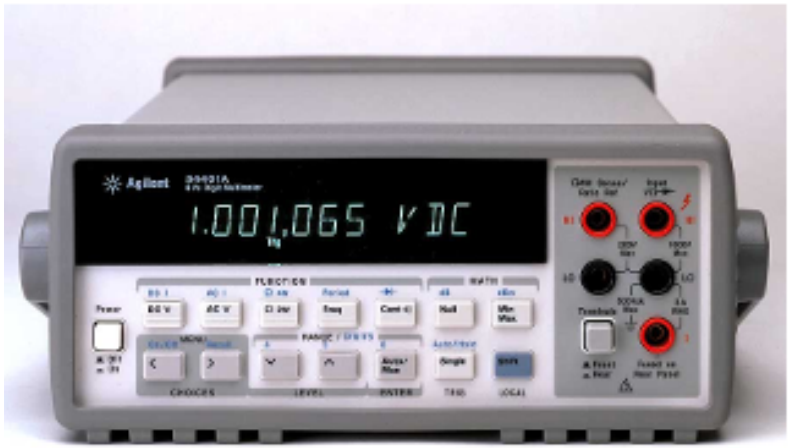
```
import serial
instrument = serial.Serial("/dev/ttyUSB0",
                           baudrate=19200,
                           timeout=1)
instrument.write(cmd)
```


DIGITAL (PWM~)
UNO
ARDUINO
ON
POWER
ANALOG IN

GPIB: General Purpose Interface Bus

```
import visa
oscilloscope = visa.instrument("GPIB::12")
oscilloscope.write("*IDN?")
print oscilloscope.read()
```


Agilent
10.099 969 829

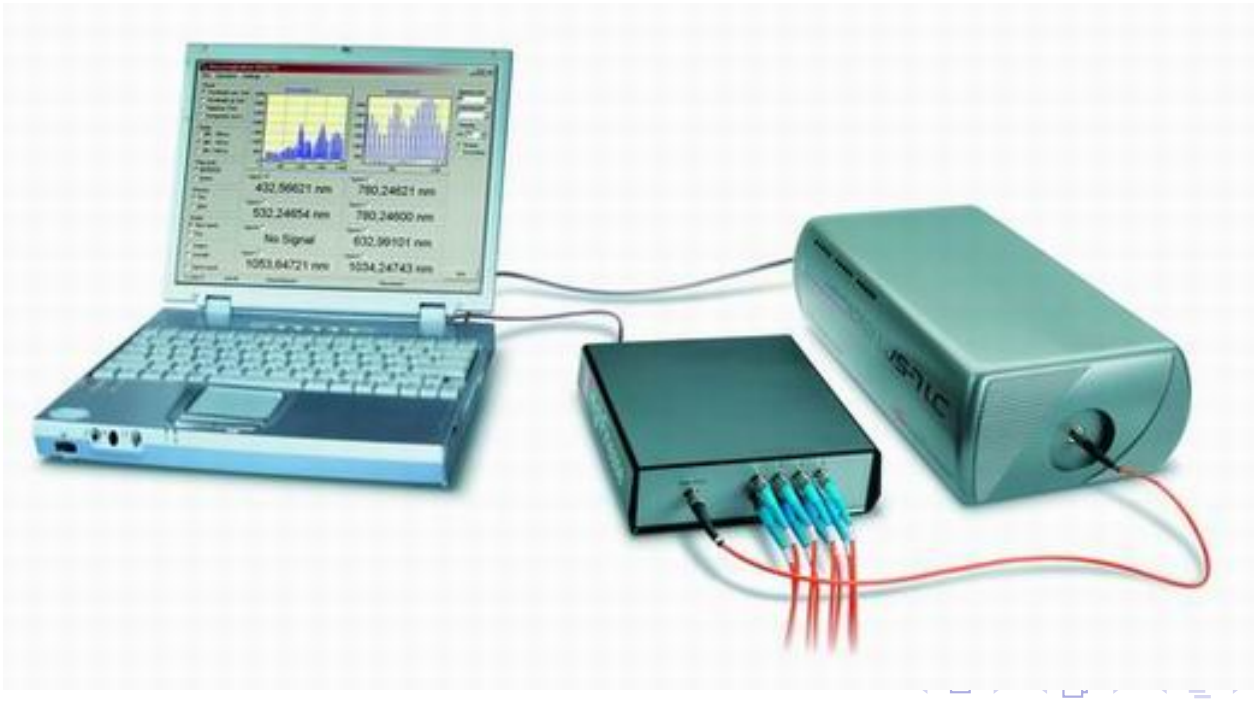

Agilent
1.001,065 V DC

FireWire IEEE-1394

```
import pydc1394
lib = pydc1394.DC1394Library()
cams = l.enumerate_cameras()
cam0 = fw.Camera(l, cams[0]['guid'], isospeed=800)
image = numpy.array(cam0.current_image, dtype='f')
```

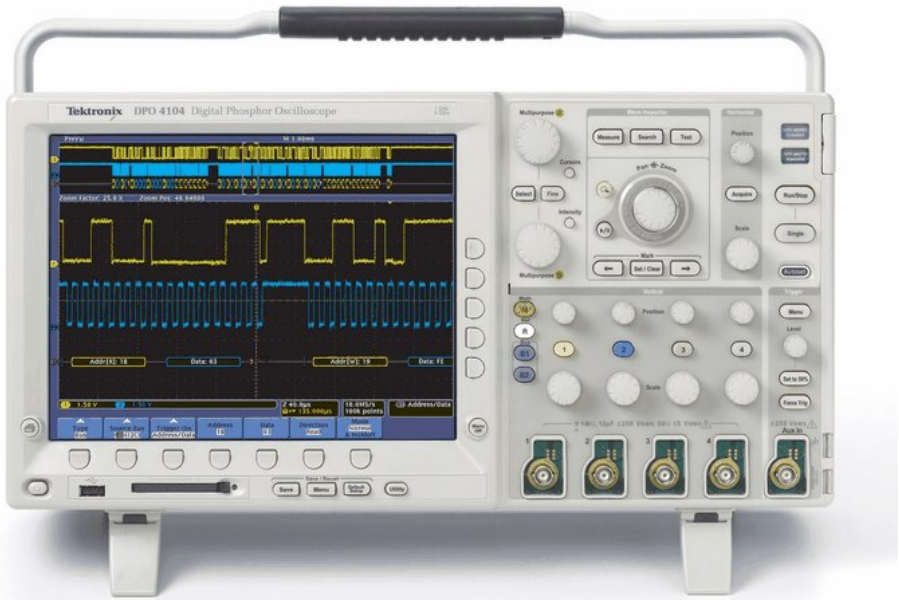
ctypes

```
import ctypes
my_dll = ctypes.windll.dll_name
receive_data = my_dll.ReceiveData
receive_data.restype = ctypes.c_long
print receive_data()
```



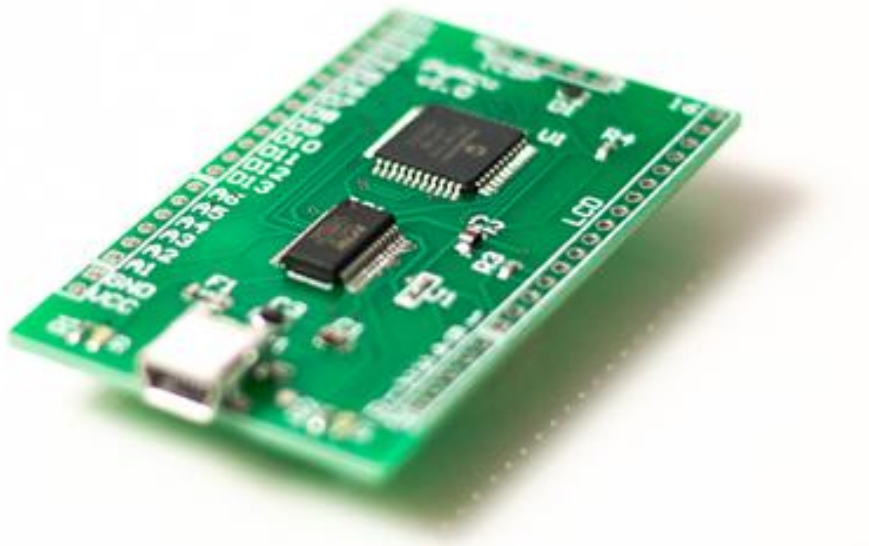
USB Test and Measurement Class

```
import os
file = os.open(device, os.O_RDWR)
os.write(file, command)
```



PyMCU - Python controller microcontroller unit

```
import pymcu
board = pymcu.mcuModule()
board.pinHigh(1)
board.pausems(500)
board.pinLow(1)
board.pausems(500)
```



Interface

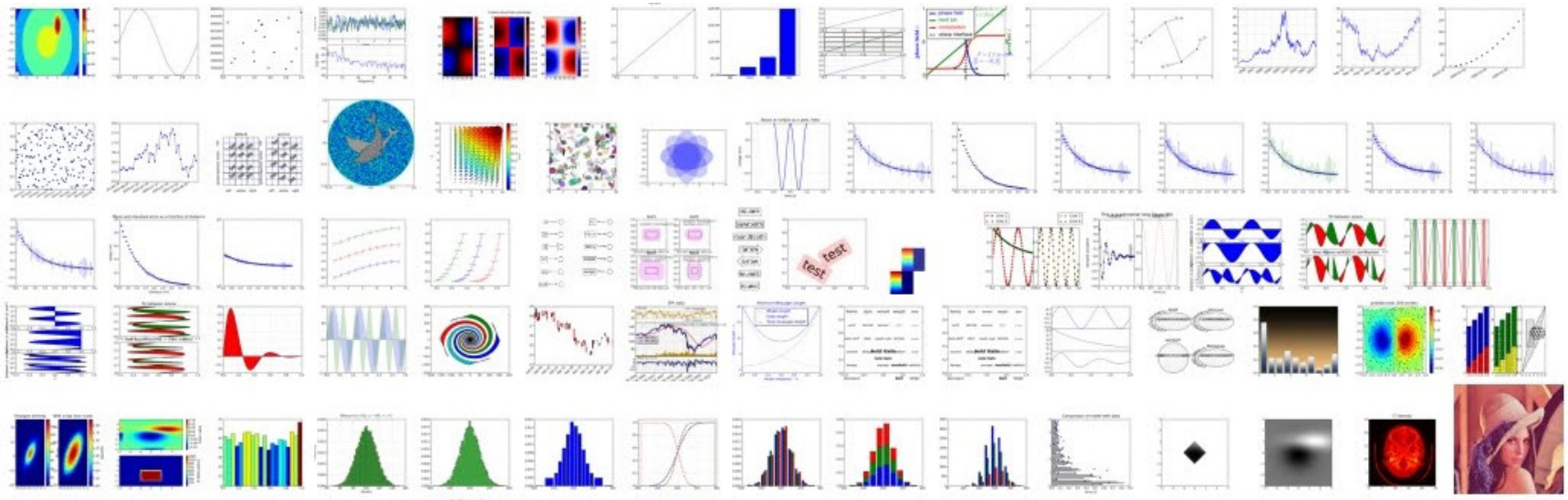
Tools of control

Analysis

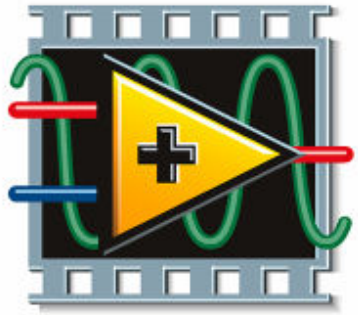
Tools of analysis:

Matplotlib aka. pylab

```
import pylab
import numpy
data = numpy.loadtxt('data.csv')
pylab.plot(data[:, 0], data[:, 1])
pylab.show()
```



Competitors



Balance

imrehg@gmail.com
https://gergely.imreh.net