



EIE4512 - Digital Image Processing

Tutorial-Python

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Agenda

Python Tutorial:20 minutes

Matlab Tutorial:20 minutes

Matlab & Python Practice:20 minutes



Python Getting Start

► Brief Introduction

- Python is an interpreted, high-level, general-purpose programming language.
- IDE&Editor: Pycharm, Subline, Atom

► Package Manager

- conda
tsinghua mirror
<https://mirrors.tuna.tsinghua.edu.cn/help/anaconda>
- pip

► Import Package

```
import PIL
import scipy

import PIL, scipy
from PIL import ImageFilter, Image

import numpy as np
```

► Control Flow

```
a = 1
if a == 1:
    print('helloworld')
elif a == 2:
    print('hellopython')
else:
    print('helloscipy')
```



► Loop

```
for i in range(1000):  
    print('index:', i)  
  
st = ['a', 'b', 'c', 'd']  
for s in st:  
    print(s)  
i = 0  
while i<5:  
    print('hello')  
    i+=1
```

► Function

```
def add_one(a):  
    return a+1  
  
add_one(1)  
  
l2 = map(add_one, [1,2,3,4])  
print(l2)  
l2 = map(lambda x:x+1, [1,2,3,4])  
print(l2)  
l2 = filter(lambda x:x%2==0, [1,2,3,4,5,6])  
print(l2)
```



Basic Image I/O

► Read,Save,Show image

```
from scipy.misc import imread,imresize,imsave
import numpy as np
import scipy
import matplotlib.pyplot as plt

def read(path):
    img = imread(path)
    return img

def save(path, img):
    img = imsave(path, img)

def show(img):
    plt.figure()
    plt.imshow(img)
    plt.show()
```



Practice

- ▶ Numpy basic operations
- ▶ Using array indexing on image
- ▶ Trying different intensity level resolution
- ▶ Gray, binary image conversion
- ▶ Resizing the image & interpolation
- ▶ Trying interpolation by yourself instead of using library

