“COMPUTER VISION”

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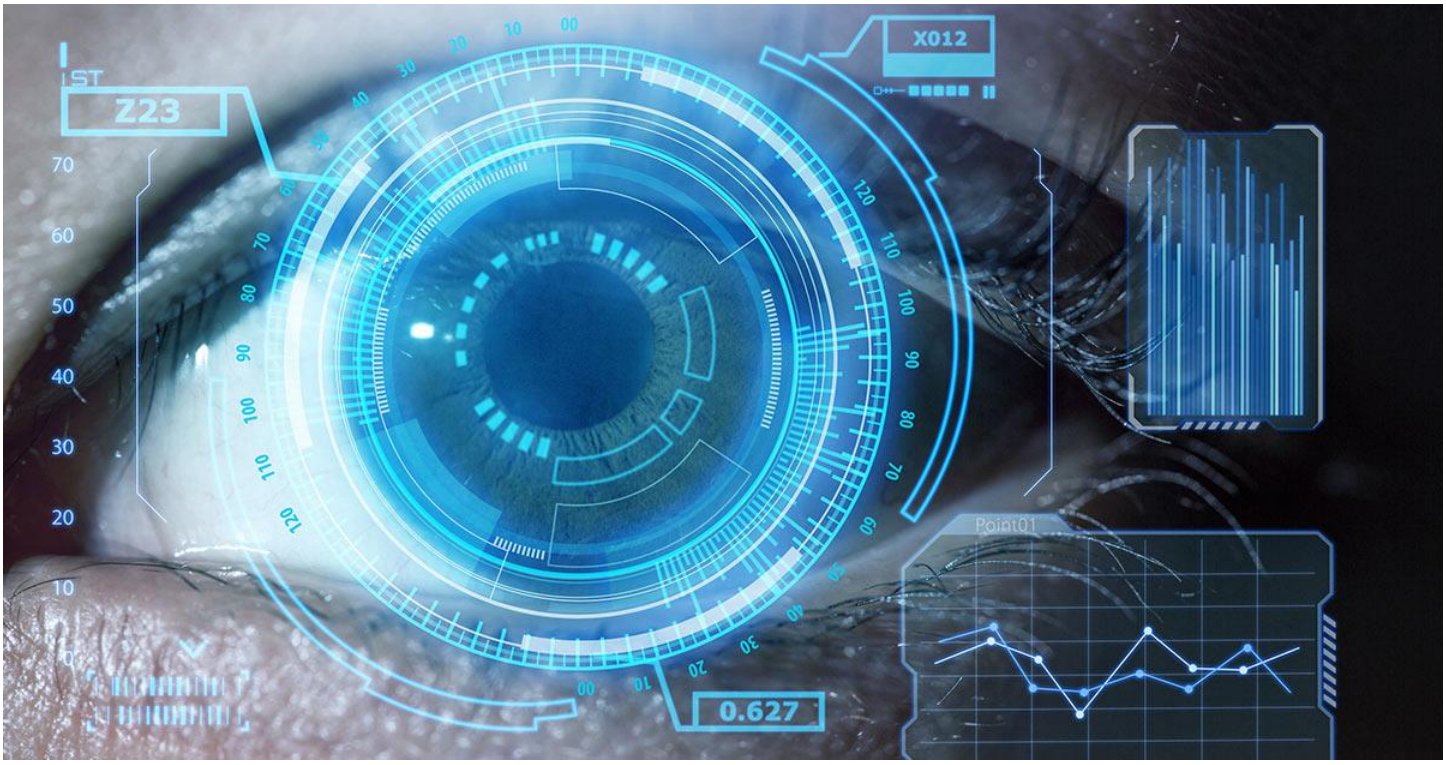

SESSION NO.“2”

- NUMPY LIBRARY

1. Vectors and Matrices from List
2. Automatic Creation of Vectors and Matrices
3. Random Generation and Identity Matrix
4. Numpy Builtin Methods
5. 1D vector slicing and indexing
6. 2D vector slicing and indexing

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1. Automatic & random generation of vectors & matrix

```
# Vectors and Matrices from List
import numpy
num = [[1,2,3],[2,3,5]]
print(type(num))
nu = numpy.array(num)
print(type(nu))

# # Automatic Creation of Vectors and Matrices
# x = numpy.arange(0,10,1)
# a,b = numpy.mgrid[0:5,0:5]
# n = numpy.zeros(6)
# k = numpy.ones(6)
# zm = numpy.zeros((6,3))
# km = numpy.ones((6,3))

# #Random Generation and Identity Matrix
# y= numpy.linspace(0,10,25)
# r = numpy.random.rand(5,3)
# rr = numpy.random.randn(5,3)
# i = numpy.eye(5)
# rand = numpy.random.randint(1,50,20)
```

2. Numpy Builtin Methods

```
import numpy as np
nn = np.random.randint(1,50,20)
arr = np.arange(25)
ar = np.reshape(arr, (5,5))

arr.min
arr.max
arr.argmax
arr.argmin

maxnum = np.max(nn)
minnum = np.min(nn)

locmax = np.argmax(nn)
locmin = np.argmin(nn)

print(np.shape(arr))
print(np.shape(ar))
print(arr.dtype)
```

3. 1D & 2D vector slicing and indexing

```python
import numpy as np

#1D vector slicing and indexing
nn = np.random.randint(1,50,20)
arr = np.arange(25)

print(arr)
print(arr[1])
print(nn)
print(nn[1])
print(arr[1:4])
print(arr[:5])
print(arr[5:])

arr[1:4] = 100
sliceRand = nn[:8]
sliceRand [:] = 99

sliceRand = nn[:8].copy()
sliceRand [:] = 99

#2D Matrix slicing and indexing
rd = np.random.rand(5,5)

print(rd[0])
print(rd[0][0])
print(rd[0,1])
print(rd[:2,1:3])

res = rd > 0.2
print(rd > 0.2)

cond = rd[res]
print (rd[res])

# res = rd[rd > 0.2]
```

WITH MY BEST WISHES

ENG/AHMED MUBARAK 😉