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Mind Map Outliner

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1

Definition

It deals with how computers can gain high-level understanding from digital images or videos.

Vision

2

Installation

1 Installing using pip

Opencv

pip install opencv-python

Additional library for opencv

pip install opencv-contrib-python

2 Installing from the scratch

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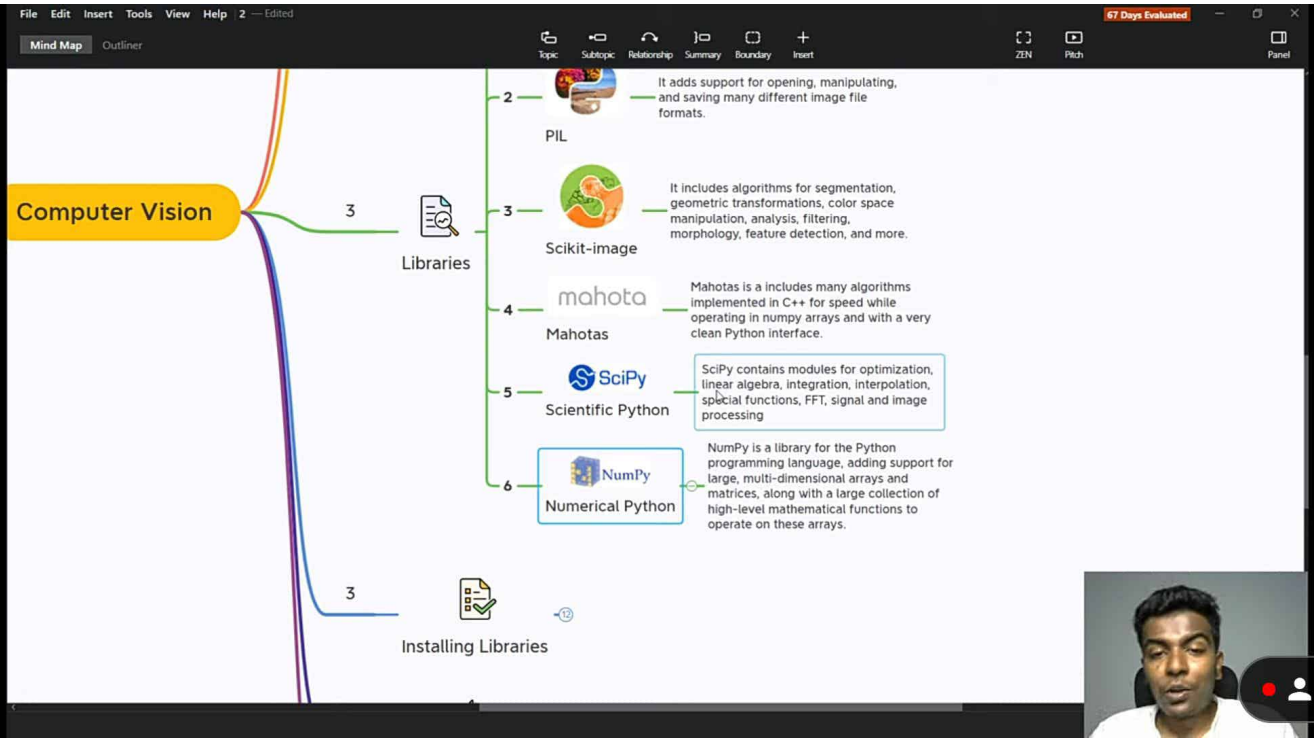
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Computer Vision
3
Libraries
2
PIL
It adds support for opening, manipulating, and saving many different image file formats.
3
Scikit-image
It includes algorithms for segmentation, geometric transformations, color space manipulation, analysis, filtering, morphology, feature detection, and more.
4
mahota
Mahotas
Mahotas is a includes many algorithms implemented in C++ for speed while operating in numpy arrays and with a very clean Python interface.
5
SciPy
Scientific Python
SciPy contains modules for optimization, linear algebra, integration, interpolation, special functions, FFT, signal and image processing
6
NumPy
Numerical Python
NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.
3
Installing Libraries
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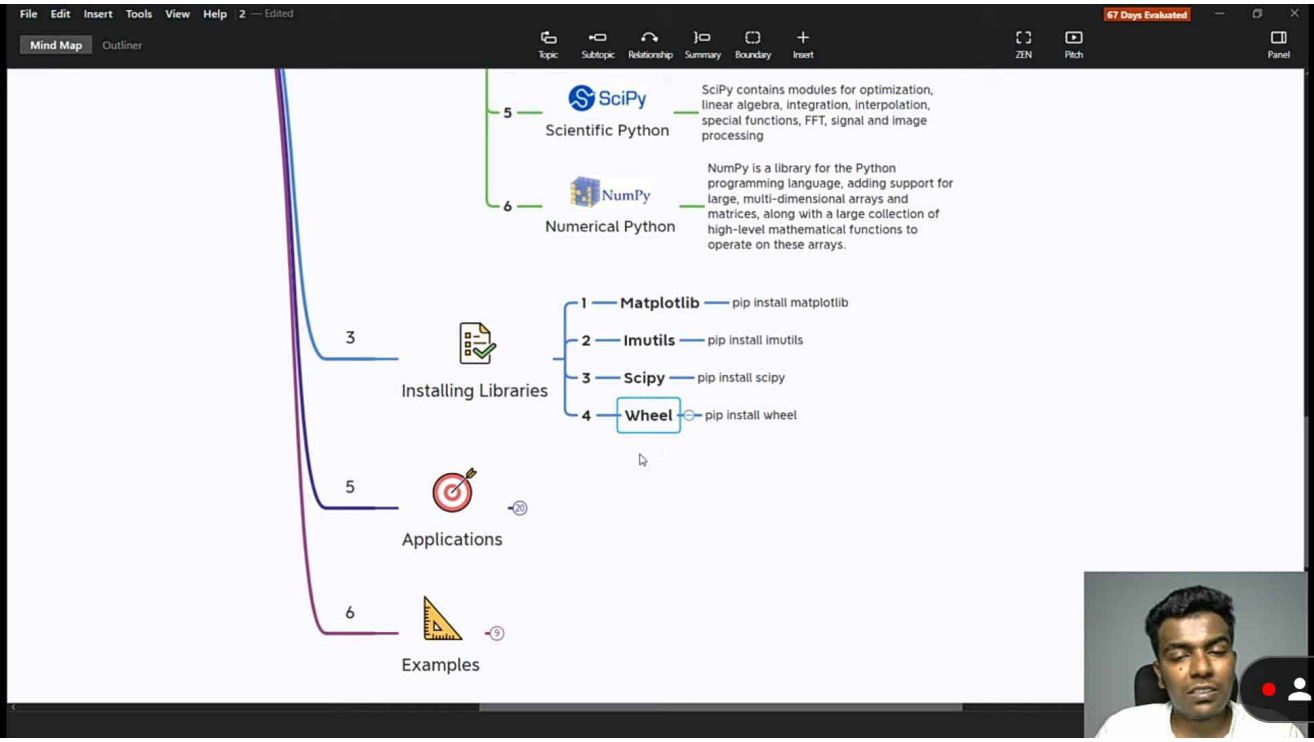
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3
Installing Libraries
1 Matplotlib pip install matplotlib
2 Imutils pip install imutils
3 Scipy pip install scipy
4 Wheel pip install wheel
5
Applications
6
Examples
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ex1.py - E:\DeepLearning\Day 2\2\ex1.py (3.7.8)

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```
import cv2
import imutils

img = cv2.imread("sample1.jpg") #read an Image
resizeImg = imutils.resize(img,width=20) #Resize an Image
cv2.imwrite("resizedImage.jpg",resizeImg) #Save an image
```

ex2.py - E:\DeepLearning\Day 2\2\ex2.py (3.7.8)

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```
import cv2
img = cv2.imread("sample2.jpg")

gaussianBlurImg = cv2.GaussianBlur(img,(21,21),0)
cv2.imwrite("gaussianImage.jpg",gaussianBlurImg)
```

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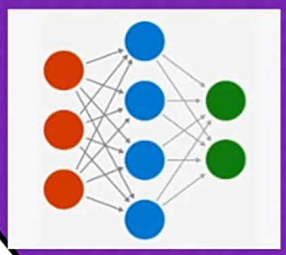
```
import cv2
img = cv2.imread("sample2.jpg")
grayImg = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
thresImg = cv2.threshold(grayImg,180,255,cv2.THRESH_BINARY)[1]
cv2.imwrite("thresholdImage2.jpg",thresImg)
```

Deep Learning Terminology - 1

Bias

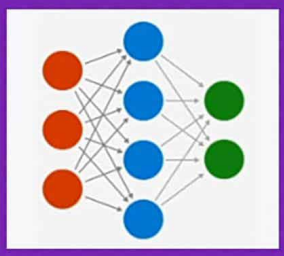


- In addition to the weights, another linear component is added to the weight multiplication to the input, called as the bias
- to change the range of the weight multiplied input

Deep Learning Terminology - 2

Activation Function

- Once the linear component is applied to the input, a non-linear function is applied to it
- The output of activation function = f(a*W1+b)



Types

- **Sigmoid**
- **ReLU(Rectified Linear Units)**
- **Softmax**

Deep Learning Terminology - 3

Perceptron

- A perceptron is a simplest & Oldest form of Neural network which is a simple linear binary classifier
- perceptron is a single-layer neural network.

Single layer - Single layer perceptrons can learn only linearly separable patterns

Multilayer - Multilayer perceptrons or feedforward neural networks with two or more layers have the greate processing power