



CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT, ODISHA

Workshop

on

"AI, ML and Video Processing"

Date: 12-06-2021 to 25-06-2021

Resource Person:

Dr. Sujata Chakravarty

Dr. Dillip Rout

Dr. K V Sriharsha

Mr. Debraj Rana

Center for Data Science and Machine Learning,
Centurion University of Technology and Management

Co-ordinator:

Dr. Sujata Chakravarty

Department of Computer Science and Engineering

No. of Participants: 48

About the Session:

This session gives a brief introduction about the AI, ML and Video Processing. With the rise in compute power and data proliferation, ML has moved from the peripheral to being a core part of businesses and organizations across industries. The purpose of this program is to demystify artificial intelligence and machine learning through hands-on training. This session explains starting from machine learning to advanced AI application areas to develop, evaluate and deployment of a model.

Objectives:

- To introduce AI, ML and Video processing
- To introduce different ML techniques
- To implement various techniques in python

Outcome: This session helps to design and implement various machine learning algorithms to use in real-world applications by gaining the knowledge of issues and challenges of machine learning.


Photographs of the event:


12-06-2021

Artificial Intelligence and its Applications: Financial Engineering; Biomedical Data Classification; Smart Agriculture by **Dr. Sujata Chakravarty**

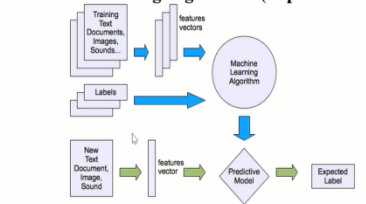
**Artificial Intelligence and its Applications:
Financial Engineering; Health Care; Smart
Agriculture**

Dr. Sujata Chakravarty, Senior Member IEEE
Professor & Head
Dept. of Computer Science & Engineering
Coordinator: Center for Data Science & Machine Learning



Centurion University of Technology & Management, Odisha


Machine Learning Algorithms (Supervised Learning)

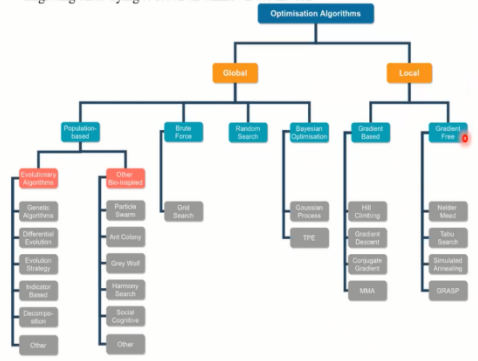


Example

Input layer	Hidden layer	Output layer
Input #1	[Hidden nodes]	Output
Input #2		
Input #3		
Input #4		

Evolutionary Algorithms

- Evolutionary algorithms are an attempt to replicate the natural evolution and get the best set of parameters for any system to be optimized.
- Evolutionary algorithms use techniques inspired by **evolutionary biology** such as inheritance, mutation, selection, and crossover (also called recombination). Whereas, Bio-Inspired algorithms are inspired by the **social behavior** of a flock of migrating birds trying to reach an unknown destination



Scaling of Dataset

$$\hat{x}_i = \frac{x_i - X_{\min}}{X_{\max} - X_{\min}}$$

where x_i is the current price
 \hat{x}_i is the scaled price
 X_{\min} and X_{\max} are the minimum and maximum of the dataset

To show the performance of the Model (Prediction)

Mean Absolute Percentage Error (MAPE) = $\frac{1}{N} \sum \left| \frac{y - \hat{y}}{y} \right| \times 100$

Root Mean Square Error (RMSE) = $\sqrt{\frac{1}{N} \sum (y - \hat{y})^2}$

14-06-2021


K-means Clustering Algorithm presented by **Dr. Dillip Rout**

K-Means Clustering Algorithm

Dr. Dillip Rout

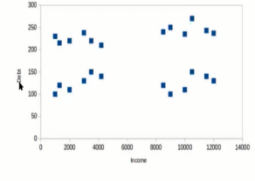
Assistant Professor, CSE, Paralakhemundi
Center for Data Science and Machine Learning
Centurion University of Technology and Management

June 14, 2021



Dillip Rout (CUTM) K-Means Clustering June 14, 2021 1 / 18

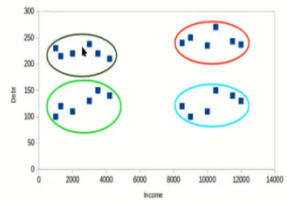
Illustration-Customer Segmentation I



- Input: Customer {ID, Income, Debt}
- Output: Customer {ID, Income, Debt, G-i}
- Group undefined
- Group on similarity

Dillip Rout (CUTM) K-Means Clustering June 14, 2021 5 / 18

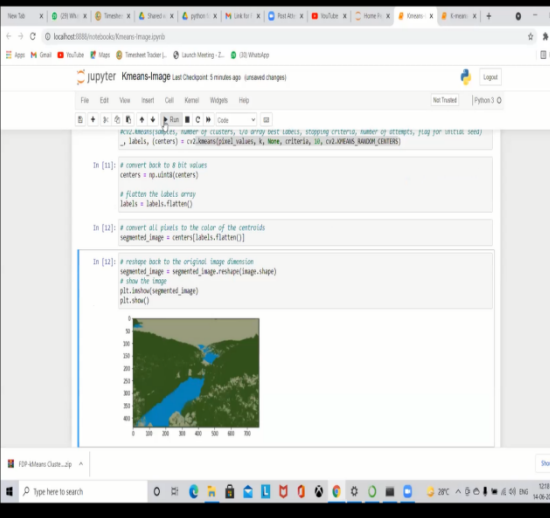
Illustration-Customer Segmentation II



Four groups (G-1,G-2,G-3,G-4)

G	Income	Debt
1	Low	Low
2	Low	High
3	High	High
4	High	Low

Dillip Rout (CUTM) K-Means Clustering June 14, 2021 6 / 18



```

from sklearn.cluster import KMeans
import numpy as np
import matplotlib.pyplot as plt

# Input data
X = np.array([[1, 2], [1, 3], [1, 4], [2, 2], [2, 3], [2, 4], [3, 2], [3, 3], [3, 4]])

# K-Means Clustering
kmeans = KMeans(n_clusters=4, random_state=0)
kmeans.fit(X)

# Get cluster labels and centroids
labels = kmeans.labels_
centroids = kmeans.cluster_centers_

# Visualize the clusters
plt.scatter(X[:, 0], X[:, 1], c=labels, s=50)
plt.scatter(centroids[:, 0], centroids[:, 1], c='red', s=100)
plt.show()

```

15-06-2021

Person Real Height Estimation Using ML presented by Dr. K V Sriharsha

PROBLEM STATEMENT

Intention:

- To use position and orientation information for monitoring human actions in surveillance areas.
- Surveillance area may be shopping mall, tournaments etc.

Pre Requisite

- Finding the distance(or depth) of person from camera

Existing Depth Estimation Strategies

- Stereo Vision Imaging

3

Work - I

Consider an object 'O' at infinity focus, photographed by rectilinear convex lens with a focal length 'f' and aperture radius 'a_l' to form an image at a distance equal to 'f' from the image plane.

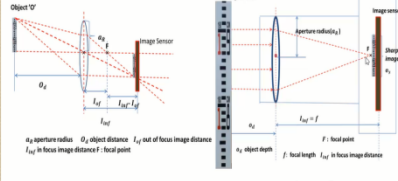


Image in out of focus (or defocused) Image in Focus

Focus is a measure of how accurate an object is placed from the camera.
Focal length: distance between center of lens and the Focal Point 'F'

6

EXPERIMENTAL STUDY


Devices	Values	
Camera Model	Nikon D5300	Experimental details for Photography Experiment
Image Sensor	23.5 × 15.6mm CMOS sensor	
Image size(pixels)	6000×4000	
Pixel size	3.9 micron	
Lens $f/1.8$ Prime Lens for Nikon DSLR Camera	Nikon AF-S Nikkor 50mm	
Exposure Settings	Values	
ISO	1000	Parameters influencing Exposure Settings
Aperture (f_{stop}) range	1.8mm to 16mm	
Exposure time(shutter speed)	1/100s	

Anthropometric Based Depth Estimation Strategies

6/15/2021

16-06-2021

Bio-Inspired Computing Techniques: Genetic Algorithm taken by **Mr. Debraj Rana** from ECE and Video Processing using Python presented by **Ms. Shivani Nanda** from CSE.



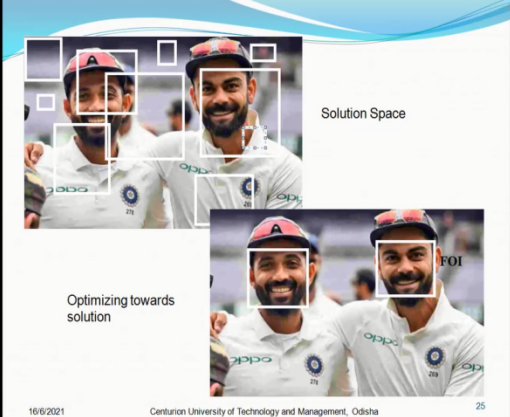
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Shaping Lives... Engineering Communities...

Optimization Technique
Case Studies on :
1. Face Identification,
2. Feature selection and classification of Dement

Presented by Debraj Rana
Center for Data Science and ML

Under the Guidance of
Dr. Sujata Chakravarty
HOD, Department of CSE

16/6/2021 Centurion University of Technology and Management, Odisha



Solution Space

Optimizing towards solution

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Videos with PYTHON

PYTHON – Handling Videos



TRAFFIC LIGHT
CAR PERSON CAR

Brochure related to the event:



WORKSHOP ON
AI ML and Video Processing

12th June 2021 - 25th June 2021

Organized by:
Department of CSE
in collaboration with Center of Data Science and Machine Learning

Resource Person

Dr. Sujata Chakravarthy
Dr. Dillip Rout
Dr. K V Sriharsha
Mr. Debraj Rana

<https://us02web.zoom.us/j/89848902673?pwd=eDNGaVBbBMXI5UmRmZFZk9mYVJLQT09>
Meeting ID : 898 4890 2673 | Passcode : p3bf6c

centurion university of technology and management
Shaping Lives... Empowering Communities...

List of Participants

1	SANDEEP KUMAR SAHU
2	LITUN GHADAI
3	AMAR KUMAR
4	SUMAN DANDAPAT
5	ABHIJIT SAMANTA
6	SMRUTI RANJAN SATPATHY
7	ABINASH PRADHAN
8	RITESH KUMAR NAHAK
9	DEEPAK KUMAR SAHU
10	SIBIL SARJAM SOREN
11	DUVVADA SAI KRISHNA
12	PRABIN KUMAR CHOUDHURY
13	RITESH KUMAR TARAI
14	M. RAMAKRUSHNA
15	SUMEET KUMAR SINGH
16	ASHUTOSH DASH

17	MOJJADA MORARJI
18	DEVADI ESWARA RAO
19	CHALLA PRADEEP KUMAR
20	KOTRA SAI DINESH
21	SAVARA NARESH KUMAR
22	BURAGAPU ESWARA KUMAR
23	JANNI PRASAD
24	UDAY KUMAR DEVKAR
25	TARLI KIRAN KUMAR
26	DUMMU MANOHARA RAO
27	DHRUTI SUNDAR PADHY
28	JYOTI RANJAN MOHANTY
29	JITENDRA PANIGRAHI
30	AUROBINDA BISWAS
31	ASHUTOSH PANIGRAHI
32	JEETENDRA KUMAR BISOI
33	ANSUMAN SAHU
34	BATTINI MADHURI
35	RAJESH PAHAN
36	SAGAR MAHANTY
37	K. RAMBARDHAN
38	MRUTYUNJAYA MOHANTY
39	RASHMI RANJAN BEHERA
40	SUBHRANSU SEKHAR PATRA
41	MANOJ KUMAR DAKUA
42	V.V SRI HARSHA
43	SRIRAM PANDA
44	MURIPINTISHIREESHA
45	SONALIRATH
46	SASANAPURI SUNEELA
47	PRATYUSH RANJAN PADHY
48	MURIPINTISHIREESHA



Prof. KVD Prakash
Dean - IIE & HRD



Dr. Prasanta Ku. Mohanty
Dean Academic