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Assignment no-1

Outline the various phases of design cycle and describe the design cycle using real time instance

There are various sequence of activities that are used for designing the pattern Recognition systems. These activities are as follows.

The Design Cycle-

Collect data
- collecting training and testing data.

Choose features
Domain dependance.

Choose model
Domain dependance

Train
supervised learning
Onsupervised learning

Evaluate
performance with future data.

Data collection -
This step basically includes collecting of data either from open source dataset or collecting through crawling different websites thus it plays a crucial role as more varies a data is better accuracy and prediction we have in our result set.

Feature choice -
Feature selection it is one of the core concepts in machine learning which highly impacts the performance of the model it is the first and foremost step of model designing it is basically the process where you select feature automatically or manually which help later in predict.

Model selection -
Model select is the process of selecting one model from available machine learning model it can be of supervised learning or unsupervised learning basically in the process.

Training -
The process of training a model involves providing an ML algorithm with training data to learn from.

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Evaluate-
It is basically evaluation of the model build so far to see if it can correctly predict upon unknown dataset and how it does the future prediction.

Example of classific^{n} of fish species-

Image acquisition by sensor	
Image enhancement & restoration filtering	classification and Recognition- classifi^{n} & interpret^{n}
Feature Extraction Edge detection Texture Intercst points	objects based on selected features Recognize objects using probabilistic techniques.
Segmentation Impose some order on group of pixels to seperate them from each other.	

1. Data Collection:-
Collecting various photos of fishes at various angles. pre-processing:
Image enhancement, seperating touching or occluding fish.
finding the boundry of fish.

2. Feature Extraction-
posi^n of mouth, length, width, lightness, number and of fins will be the features for this domain.

3. Model selection-
Selecting the model so as to classify fish as salmon or sea bass.

4. Training -
Training in order to build model accurately by removing noise and other hindrances.

5. Evaluation-
model so far build is to be evaluated how accurately it predict the species

example – facial classifn on basis of gender

1. Data collⁿ –
We will first collect data that it photos of diffⁿ faces from diffⁿ angles in diffⁿ lighting conditions.

2. Feature choices –
Once we have data set next comes selecting features on basis of which predicⁿ is to be performed here in this case we select the features such as face length.

3. Model choice –
Then we select the model which is one more suitable for our dataset & features selected.

4. Training –
Next we train model by taking training which is 80 percent of the available model once the model is trained.

5. Evaluation –
Once model is able to distinguish correctly a boy and a girl next we check it for test dataset and see how accurately it can predict.

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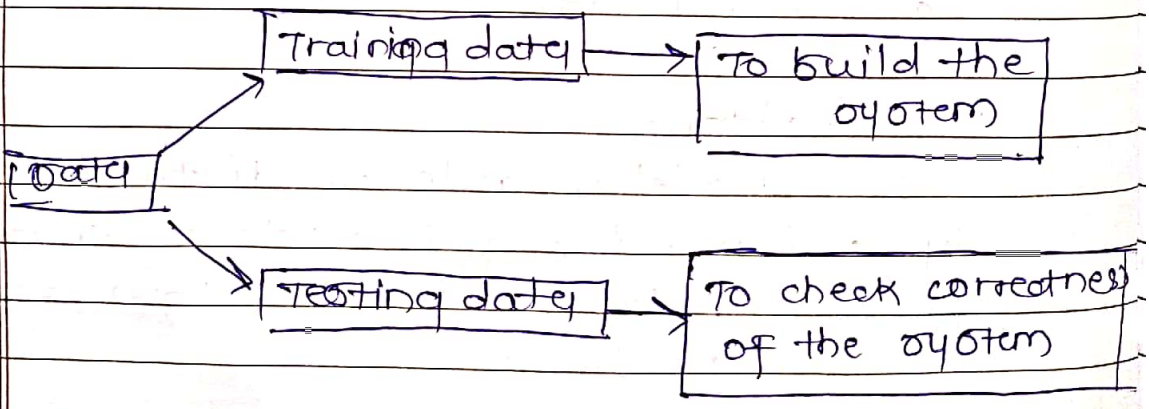
2. Interpret the diff^n steps involved for training & learning in pattern Recogni^n with suitable example & diagrammatic represental^n.

Learning is the most important phase as how well the system performs on the data provided to the system depends on the data.

Training —
Training data is used to build a model. It consist of the set of images which are used to train the system.

Testing —
Testing data is used to test system. ~~whether the data.~~ It is the set of data, which is used to verify whether the system is producing the correct o/p after being trained.



Real-time examples and explanations:-

A pattern is a physical object or an abstract notion.
While talking about the classes of animals, a description of an animal would be a pattern.
While talking about various types of balls, then a description of a ball is a pattern. In the case balls considered as pattern, the classes would be football, cricket ball, table tennis ball, etc.

Examples -
While representing spherical objects (25, 1) may be represented as an spherical object with 25 units and 1 unit diameter.
The class label can form a part of the vector. If spherical objects belong to class 1, the vector would be (25, 1, 1), where the first element represents the weight of the object, the 2nd element, the diameter of the object & the third element represents the class of the object.

Other Applications -

Image processing, segmentn & analysis -

Pattern recognition is used to give human intelligence to machine which is required in image processing.

Computer vision—

Pattern recognition is used to extract meaningful features from given image/ video samples & is used in computer vision for various appn, like biological & biomedical imaging.

Radar signal classific^{n}/ analysis—

pattern recognition and signal processing methods are used in various appns of radar signal classifications like AP mine detection and identificat^{n}.