Pattern Recognition - Web course

COURSE OUTLINE

This course deals with pattern recognition which has several important applications. For example, multimedia document recognition (MDR) and automatic medical diagnosis are two such.

The emphasis of the course is on algorithms for pattern recognition. The representation of patterns and classes and the proximity measures are an important aspect of pattern recognition and are described in the earlier lessons.

When the data sets are very large it is meaningful to reduce the data and used this reduced data for pattern classification. The details of feature extraction and feature selection and prototype selection have been discussed.

In pattern recognition, we deal with classification and clustering of patterns. The two well-known paradigms of machine learning namely, learning from examples or supervised learning and learning from observations or clustering are dealt with in this course.

In supervised learning the classifiers such as nearest neighbour classifier, bayes classifier, decision trees and support vector machines have been dealt with.

Clustering is an important aspect of unsupervised learning and has been covered extensively in this course.Combination of classifiers have been dealt with where more than one classifier is used to arrive at a class label.

The applications of pattern recognition to a practical problem has been handled where the various techniques used on a document recognition problem have been discussed.

COURSE DETAIL

Module No.	Title/s	Lessons	No.of Hours
1	Introduction – Definitions, data sets for Pattern	0,1	2

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Computer Science and Engineering

Pre-requisites:

Probability and Programming.

Coordinators:

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	Recognition		
2	Different Paradigms of Pattern Recognition	2	1
3	Representations of Patterns and Classes	3,4	2
4	Metric and non-metric proximity measures	5,6	2
5	Feature extraction	7,8	2
6	Different approaches to Feature Selection	9,10	2
7	Nearest Neighbour Classifier and variants	11,12	2
8	Efficient algorithms for nearest neighbour classification	13,14	2
9	Different Approaches to Prototype Selection	15,16,17	3
10	Bayes Classifier	18,19,20	3
11	Decision Trees	21,22,23,24	4
12	Linear Discriminant Function	25,26,27	3
13	Support Vector Machines	28,29	2
14	Clustering	30,31,32,33	4

15	Clustering Large datasets	34,35	2
16	Combination of Classifiers	36,37,38,39	4
17	Applications – Document Recognition	40,41	2
	TOTAL		42

References:

1. Devi V.S.; Murty, M.N. (2011) Pattern Recognition: An Introduction, Universities Press, Hyderabad.
2. R. O. Duda, P. E. Hart and D. G. Stork, Pattern Classification, Wiley, 2000.