Pattern Recognition (3-0-0-3)
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Abstract
The concept of pattern recognition has been recognized as an important factor in the design and analysis of modern computerized information system. The applicability of such design and analysis is observed in varied field such as engineering, computer science, information science, statistics, biology, medicine, linguistics, and psychology. The course comes under the broad spectrum of decision support system. This course is aiming towards the study of automatic pattern recognition and classification techniques. Starting from the Bayesian decision theory, the concept of classifier, both supervised and unsupervised, will be covered. The concept and the study of feature evaluation and indexing will also be covered. Keeping in mind that pattern recognition is a subset of decision making system, the concept of generalized decision theory will also be discussed.

Outline
- Introduction (# Lec. 1)
- Quick review of probability and random variables (# Lec. 5)
  - Axiomatic definition of probability
  - Conditional probability (Bayes rule)
  - Concept of random variables
  - A few discrete and continuous random variables
- Bayesian decision rule (# Lec. 8)
  - Bayesian decision rule under Normality assumption
  - Minimum distance classifier
  - Bayesian decision rule for minimum risk
- Nearest neighbour decision rule (# Lec. 2)
- Perceptron learning rule (# Lec. 1)
- Unsupervised classification rule (# Lec. 5)
  - M-means algorithm
  - Linkage algorithm
  - ISODATA method
- Feature selection (# Lec. 2)
  - Optimal
  - Sub-optimal
- Bayesian Networks (BNT) (# Lec. 5)
  - Graphical models
  - BNT representation
  - Parameter learning
  - Structure learning
- Introduction to Decision Theory (# Lec. 10)

References: