**Literature Survey**

**1.**

**Topic:** Personalized Clothing-Recommendation System based on a Modified Bayesian Network

**Author:** Lin Yu-Chu, Yuusuke Kawakita, Etsuko Suzuki, Haruhisa Ichikawa

**Year and University:** 2012, Department of Informatics University of Electro-Communications, Tokyo, Japan

**Summary**

This paper presents a clothing-recommendation system that suggests personal combinations from a user’s wardrobe. Online shopping websites use such systems that make recommendations to a user on the basis of other users’ behaviour, under the assumption that all users behave similarly. The personal user preferences are not captured. Therefore, this paper proposed a system where a user gets personalized recommendation based on his inputs, previous record of recommendation and previously owned clothes in his wardrobe. The system takes user feedback after it recommends clothes to user. If a user is not satisfied, the system will learn and will make new recommendations keeping in mind that previous results should not be recommended again.

**2.**

**Topic:** Bayesian Network

**Author:** Michal Horný

**Year and University:** 2014, Boston University School Of Public Health

**Summary**

A Bayesian network is a representation of a joint probability distribution of a set of random variables with a possible mutual causal relationship. The network consists of nodes representing the random variables, edges between pairs of nodes representing the causal relationship of these nodes, and a conditional probability distribution in each of the nodes. The main objective of the method is to model the posterior conditional probability distribution of outcome (often causal) variable(s) after observing new evidence. Bayesian networks may be constructed either manually with knowledge of the underlying domain, or automatically from a large dataset by appropriate software.

Bayesian Network is often confused with Markov Model. In Bayesian Network, all the nodes are different random variables connected to each other if there is a probabilistic relationship between them. In Markov Model, only one node is a random variable and rest are its realizations.

**3.**

**Topic:** Decision Tree Learning

**Author:** Tom Mitchell

**Year and Book Name:** 1997, Machine Learning (Chapter 3)

**Summary**

Decision tree learning is a method for approximating discrete-valued target functions in which the learned function is represented by a decision tree. The basic algorithm, ID3, learns decision trees by constructing them top-down, beginning with the question “which attribute should be tested at the root of the tree?”. So to know the answer to the question, this algorithm has to make calculations to find out Entropy and Gain. In order to define information gain precisely, we begin by defining a measure called Entropy.

Entropy(S) = -p+ log2 p+ - p- log2 p-

The information gain, Gain(S, A) of an attribute A relative to collection of examples S is defined as

Gain(S, A) = Entropy(S) – summation((mod (Sv) /mod (S) \* Entropy(Sv))