Probability for Machine Learning

Description

This course introduces the students to the concepts of probability and helps them understand the fundamentals of this area of mathematics. The idea is to have a better grasp on the concepts of probability in order to be able to see clearly how they contribute to the efficiency of most machine learning algorithms.

Learning Objectives and Outcomes

- Understand what is a probability and what are its properties
- Understand the concepts of independence, marginal, joint and conditional probability, probability distribution, mean, variance, standard deviation
- Understand the difference between discrete and continuous probability distribution
- Understand what makes the normal distribution different from all the other probability distributions
- Be able to use Bayes Theorem

Course Schedule and Contents

Session #1	▪ Reminder: connection between probability and machine learning ▪ Definition of a probability, a random variable ▪ Explanation of the properties of a probability ▪ Concept of independence of 2 events ▪ Difference between marginal and joint probability
Session #2	▪ Mean, variance and standard deviation ▪ Discrete probability vs continuous probability ▪ Density function ▪ Probability distributions
Session #3	▪ Normal distribution ▪ Central limit theorem
Session #4	▪ Conditional probability and Bayes theorem ▪ Assignment

Grading

Assignment: 100%

Policies

- I expect you to submit your reports on time to receive proper credit/grade.
- Any work submitted must be your own.
- I expect everyone to contribute equally to group assignments
- Attendance in every class is expected. Class participation and discussion are strongly encouraged.
- Late work will not be accepted unless prior arrangements have been made directly with me.
- Cases will be decided on an individual basis.

Good Luck!