

Department: Mathematics and Computer Sciences

Division: Statistics

Level and Major: Graduate

Course Title: Statistical Machine Learning

Number of Credits: 4

Prerequisite:

Lecturer:

Course Description:

The Course aims to: Acquaintance of students with statistical methods in Machine learning

Course Goals and Objectives:

Course Topics:

1- Classification, Linear regression, Generalized linear models.

Mixture models, Grafical models, Hiden Markov models.

Model selection

2- Classification, Regression, Clustering

Estimation of Statistical Distribution function

Dimensionality reduction and Data reduction

Bayesian learning

3- Sparsity in High dimensional data

Lasso and Basis Pursuit for Sparsity data

Sparse Linear Regression algorithms

Sparse Graphic models

4- Monte Carlo Methods

5- Non-linear model learning by Reproducing Kernal Hilbert spaces

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Reading Resources:

1- Introduction to Statistical Machine Learning, Elsevier 2016, M Sugiyama

2-Statistical Learning with Sparsity, The Lasso and Generalizations, By: Trevor Hastie
Robert Tibshirani, Martin Wainwright-CRC Press

Evaluation: