DATA SCIENCETECH INSTITUTE

MSc in Applied Data Science & Big Data

Artificial Neural Networks and Introduction to Deep Learning

Volume of classes hours: 25 hrs *(± same personal work expected)*

Course summary:

Prerequisites: some knowledge of calculus, linear algebra, and statistics

Required Readings: The textbook for the course is "Pattern Recognition and Machine Learning" by Chris Bishop. Most of the required readings will be parts of the textbook but there will be some additional readings and we will not cover all of the chapters in the textbook.

Lecture 1: Overview of Machine Learning
Lecture 2: Linear Regression
Lecture 3: Linear Classification
Lecture 4: Neural Networks trained by Backpropagation
Lecture 5: Clustering and Mixture Models
Lecture 6: Decision Trees and Mixtures of Experts
Lecture 7: Continuous Latent Variable Models
Lecture 8: Deep Belief Nets
Lecture 9: Time-series Models
Lecture 10a: Nearest Neighbor and Kernel Density
Lecture 10: Support Vector Machines
Lecture 11: Applications of machine learning.
Lecture 12: Gaussian Processes

Course Objectives:

Provide students mathematical tools to understand machine learning techniques.

Technologies Used:

Parts of the assignments will be done in Matlab, but prior knowledge of Matlab is not essential.

Course evaluation:

Projects .