**Machine learning ITI8565**

# Home assignment 2

# Supervised learning.

Starting date 06.04.2018 deadline 19.04.2017 16:05

General requirements:

- No plagiarism in any form. Please cite all the sources you used.
- Prepare your solution in such a way, that after extracting files from the archive into a single folder it may be executed on any computer with MATLAB. Data file (if necessary) for evaluating your solutions will follow the same structure as during the practice: single array where rows correspond to the elements and columns correspond to different dimensions.
- Prepare a short write-up with the analysis of achieved results. Maximum 2 pages 12pt. NB! No title page! Include your name into the file name and state it in the header of the first page.
- Submit your solution by means of gitlab.cs.ttu.ee create a project iti8586_your_name_ha2 and share it with Sven Nõmm
- During the practice on 19.04 you will have to demonstrate your solution and will be asked few questions. Note it is mandatory to attend practice on 19.04 and demonstrate your solutions.
- If you are unsure about using some third party function contact your teacher.
- NB! Please submit your report as PDF file via ained.ttu.ee

## Exercise 1.

Implement your own function (for MATLAB) for k- nearest neighbors. You are not allowed to use standard MATLAB function to fined nearest neighbors.

## Exercise 2.

Implement in MATLAB your own function for gradient descent (for the functions of at least two arguments).

## Exercise 3.

Implement in MATLAB Levenberg-Marquardt algorithm for the network with two hidden layers whereas each layer has two neurons.

## Exercise 4.

Implement in MATLAB your own function to train decision tree classifier.

## Bonus Exercises:

## Exercise 5.

Implement in MATLAB your own linear regression model building.

## Exercise 6.

Implement your own Support vector classifier. (Any level of complexity).