Introduction to Intelligent Systems / Lab 1

Non-regularized regression

Jae Yun JUN KIM*

July 2, 2019

Due: Before the next lab session.
Evaluation: Code and explanation about the code (in groups of up to 3 people)
Remark:

- Only groups of one/two/three people accepted. Forbidden groups of larger number of people.
- No late homework will be accepted.
- No plagiarism. If plagiarism happens, both the "lender" and the "borrower" will have a zero.
- Code yourself from scratch. No homework will be considered if you solve the problem using any ML library.
- Do thoroughly all the demanded tasks.
- Study the theory for the questions.

1 Tasks

1) Read the dataset given in the provided file `data_lab1_iis.txt` and plot the output value as a function of the input data.

2) Fit the univariate linear regression parameters to the dataset using batch gradient descent. What are the optimal values of the parameters?

3) Fit the univariate linear regression parameters to the dataset using stochastic gradient descent. What are the optimal values of the parameters?

4) Fit the univariate linear regression parameters to the dataset using the closed-form method. What are the optimal values of the parameters?

5) Plot the linear regressors obtained in 2), 3) and 4) over the original dataset.

6) Test your model choosing yourself some new input data. Plot also these results.

*ECE Paris Graduate School of Engineering, 37 quai de Grenelle 75015 Paris, France; jae-yun.jun-kim@ece.fr