

[Lab] PCA

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Lab due: Before the end of today lab session

Evaluation: Code and explanation about the code in groups of only two or three people

Remark:

- Only groups of two or three people accepted (preferably three).
 - No plagiarism. If plagiarism happens, both the “lender” and the “borrower” will have a zero.
 - Code yourself from scratch **following the theory given in lecture**.
 - No pre-lab/lab will be considered if any ML library is used.
 - Do thoroughly all the demanded tasks.
 - Study the theory for the questions.
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1 Tasks

- a. Download from the course site the 2D data stored in `data_pca.txt` file.
- b. Implement the PCA algorithm from the formulas seen in class.
- c. Plot the training data centered to the origin and the principal components.
- d. In the same figure, plot \tilde{Y} on the N-dimensional space.
- e. In a separate figure, plot the original data, the principal components (around the original data), and \hat{Y} on the N-dimensional space.
- f. Test your model with some new data.
- g. Plot test results on N-dimensional space for both the case of centered to the origin and the case of original data (i.e., away from the origin).