ITÜ FACULTY of COMPUTER and INFORMATICS ENGINEERING

ITU, Computer Engineering Dept
BLG527E, Machine Learning
Project

28.10.2022
Due: 21.12.2022 23:59

Instructor Yusuf Yaslan
Assistant Kıymet Kaya

You can choose one of the following three options for the BLG 527E project. You are allowed to form teams of up-to 2 students.

1. Feature Extraction and Selection via Robust Discriminant Analysis and Class Sparsity [1]
2. Directionally Paired Principal Component Analysis for Bivariate Estimation Problems [2]
3. Clustering of Scientific Research Papers by topic

Instructions for 1st and 2nd options:

- Re-implement and replicate the results of the paper.
- You are expected to do some implementations in your project. That is, you are expected to write code and get numerical results. Submissions without a working code will not be graded.
- After re-implementing and replicating the results for a paper, if you improve the work you will get bonus points. However, you need to perform some significant modifications to that work. Only hyperparameter optimization (or similar minor modifications) is not considered as an improvement.
- You can use frameworks such as Scikit-Learn, Pytorch, and Tensorflow in the project.
- Write a minimum of 4 pages report using IEEE Latex Template. State the problem, contributions, implementation details, dataset and experiments.

Instructions for 3rd option:

- All necessary files about the project is shared via Google Drive. Students are required to code the desired operations in the **BLG527E-Project.ipynb** file in the cells reserved for these operations. All details of what is requested are available in this file along with some example codes that may be required.
- Write a minimum of 4 pages report using the template in Overleaf. You are expected to read the comments here and create your report by giving the necessary answers under each of them. Once you meet the minimum requirements, you can improve your report however you want. Before starting the project, we recommend that you read the comments here so that you can manage your work / time plan correctly.

Submission

- Submit a zip file that includes your Python code, plots, and results until the deadline through Ninova.
- Upload your presentation slides.

Grading

- 70% Implementation
- 20% Report
- 10% Presentation

References

[1] A. Khoder and F. Dornaika, "Feature extraction and selection via robust discriminant analysis and class sparsity," in *2020 25th International Conference on Pattern Recognition* (*ICPR*), pp. 7258–7264, IEEE, 2021.

[2] Y. Fan, N. Dahiya, S. Bignardi, R. Sandhu, and A. Yezzi, "Directionally paired principal component analysis for bivariate estimation problems," in *2020 25th International Conference on Pattern Recognition* (*ICPR*), pp. 10180–10187, IEEE, 2021.