Deusto
Facultad de Ingeniería

Deep Learning - based Movie Recommendation System

Objective:

Develop a movie recommendation system that uses Deep Learning techniques to predict user preferences based on their past ratings.

Dataset:

[MovieLens](#) (you can use the MovieLens 100k, 1 or, 10M dataset, depending on the available time and resources).

Suggested steps:

1. Download and preprocess the MovieLens dataset.
2. Split the dataset into training, validation, and testing sets.
3. Implement a neural network architecture for the recommendation system.
4. Train and evaluate the model using different metrics.
5. (Optional) Implement enhancement techniques, such as incorporating content information (genre, director, actors, etc.) or utilizing more advanced architectures.

Deliverables:

1. *Source code*: Students should submit the source code for their movie recommendation system, including data preprocessing, model architecture implementation, model training, and evaluation.
2. *Project document*: Students should submit a brief document (up to 5 pages) describing the key aspects of their project. The document should include the following sections:
   a. Model architecture: Describe the recommendation model architecture, including details such as loss function or optimization algorithm. If additional techniques have been used, such as incorporating content

information or more advanced architectures, they should also be described here.

b. Results obtained: Present the model's results in terms of evaluation metrics. If possible, compare the results with other approaches or benchmark models.

c. Ways to improve the outcome: Discuss possible improvements to the model or training process that could lead to better performance.

d. Conclusions drawn: Summarize the lessons learned during the project's development and discuss the model's practical usefulness. Reflect on the limitations of the current approach and how they might be addressed in future research.

Evaluation rubric

Criterion	Excellent (90-100%)	Good (70-89%)	Satisfactory (50-69%)	Insufficient (<50%)
Implementation and Creativity	Complete implementation and use of advanced techniques. Creativity in the proposed solution.	Complete implementation with some advanced techniques.	Basic implementation with full functionality.	Incomplete or incorrect implementation.
Results Analysis	Detailed analysis of results with	Results analysis with some comparisons.	Basic description of results without	Lack of analysis or incorrect analysis of

	clear comparisons and benchmarks.		deep comparisons.	results.
Improvements and Reflection	Innovative improvement proposals and deep reflection on practical utility.	Adequate improvement proposals with proper reflection.	Some improvement proposals without much reflection.	No improvement proposals or inadequate reflection.
Document Quality	Well-structured, clear, and concise document with all sections complete.	Structured document with most sections complete.	Document with some deficiencies in structure or content.	Incomplete or poorly structured document.