

AI Project - Numerics

Project Overview

- **Main task:** Design and implement a recommendation system.
- **Open Theme:** Choose your domain of interest (e.g., movies, books, products) and what you want to focus on and develop.

Organization

- **Team work:** Teams of 4-5 students.
- **Rooms:**
 - Tuesday. A28. room 205.
 - Wednesday. A28. room 205.
 - Thursday. A28. room 205.
 - Friday. A28. rooms 207.
- **Supervision:** Present from 2 PM to 3 PM.
- **Autonomous Work:** Outside the specified hours.
- **Friday:**
 - Finalize the presentation from 9am to 11:30am (slides, demonstration, etc.).
 - Evaluation from 11:30am to 12:30pm (by me + an external guest)
 - **Final Presentation:** from 3pm to 4:30pm. 15 minutes for the whole AI class. You elect 1 representative per group will present.

Today

- Create the sub-groups.
- Choose / define your project.
- Start working.

Minimal tasks

- Choose a dataset or create your own dataset.
 - Starting points:
 - Kaggle datasets:
<https://www.kaggle.com/datasets?search=recommender+systems>
 - <https://github.com/caserec/Datasets-for-Recommender-Systems>
 - **Important:** Try select a dataset that allows easily both collaborative filtering and content-based filtering; otherwise you will have to choose two datasets (which is also possible, but more work).
- Implement matrix factorization from scratch (collaborative filtering).
- Create a recommendation system that uses deep embeddings using CLIP, BERT, learned, etc. (content-based filtering).
- Define appropriate metrics and create a pipeline to evaluate your models and compare them.

Improvement ideas

- Implement a diversity mechanism.
- Explainability of recommendations.
- Combine collaborative filtering and content-based methods (hybrid methods).
- Advanced architectures such as two-tower models.
- Web browser extension that recommends content while browsing.
- Anything else you can think of and want to implement!