

Intelligent Systems
Academic Year: 2024/2025
MSc in Computer Engineering, University of Pisa
Instructors: Pietro Ducange, Fabrizio Ruffini

Students are requested to **design** and **test** an Intelligent System which embeds AI/ML models presented during the course. The project includes the following steps:

1. **Idea** definition
2. Identification of the **ML/AI task(s)** (functional requirements) to be solved by the IS
3. Selection of a **suitable dataset** for training and test the AI/ML models
4. Analysis and **exploration** of the identified dataset
5. **Selection** of the most suitable ML/AI model(s) for solving the identified task(s)
6. Design, test and **comparison** of the selected ML/AI models (different models or a single model testing different parameters such as number of neurons and number of training epochs of an MLP). The entire KDD process must be considered.
7. Implementation of a simple **prototype** of the IS
8. Write a **simple paper** which synthesizes the previous steps
 - a. Introduction and contextualization of the idea and the proposed IS
 - b. Brief state of the art analysis
 - c. Backgrounds (description of the IS architecture)
 - d. Experimental Setup and Results discussions
 - e. Conclusions

Rules for the project:

1. The idea must be discussed and approved by the instructors (4 slides, 10 minutes presentation which summarizes the idea and a proposal for points 1-5)
2. The paper (max 8-10 pages in IEEE conference format <https://www.overleaf.com/latex/templates/ieee-conference-template/grfzhnncsfqn>) must be submitted (share the overleaf link with the instructors) and discussed (15 minutes of presentation+15 minutes for questions) before the written test.
3. The code must be submitted sharing a private github repository with the instructor (pducange and fabrizioruffini are the accounts of Pietro Ducange and Fabrizio Ruffini, respectively). The repository must include a simple but complete readme text providing all the instruction for running the code.
4. The deadline for submitting the paper and the code and the date for the project discussion will be specified by the instructions in the exam enrolment form on esami.unipi.it

Code: we expect a code written in python (a jupyter notebook must be provided and comments are needed to allow instructors to understand your way of thinking and the corresponding workflow)