Laboratory work

You will have to deal with a problem related to the control of a unicycle robot. Full details will be given in class.

General notes

- Remember that the project development, reporting, presentation is a team-work.
- Date and time for the (group) presentation of the project will be agreed. A first selection of dates will correspond to the lecture-hours of the third week of January 2025 (14-15-16/01/2025).
- A preliminary submission of the presentation file is needed 3-4 days before the actual live presentation: note this is just to provide a first document to your professor, while the actual presentation can be adjusted or improved after this submission.

Notes for the project development

- I suggest sketching out an abstract before commencing with the project development.
- The main purpose of the abstract is to trigger brainstorming about the project and it is a draft from which to start when you discuss together.
- Try and focus on a specific scenario that can be a reference to suggest how to proceed with your project development in terms of assumptions to be made, methodologies to be used, experimental/simulative validation to be setup.
- Try to place in a schematic and modular way different aspects and issues that stem from your project and you may want to study: in this sense, try to give a big picture of the project and collocate the different subproblems within that scope.
- Try to list possible mathematical and methodological tools you want to use.

Notes for the project presentation

- There is no limit to the number of slides; however, the presentation must be within 40-45mins to allow for a discussion of 20-15mins. Note that typically you spend at least one minute per slide.
- Slides, presentation, and discussion will be held in English.
- Distribute slides and schedule presentation fairly within your team, both in terms of quantity and as quality content.
- The structure of the presentation is basically free. However, it is important that there are discussed clearly these elements:
  1. Description of the application context of the project and the motivation.
  2. Description of the main issues that you specifically want to address.
  3. Intuitive description of the ideas proposed to solve the project issues.
  4. Main technical development of the ideas proposed to solve the project issues and of the obtained results.
- Try to present and explain your ideas with visual information (pictures, diagrams, videos). The slides should contain only the necessary written text, with keywords, main formulas and comments. The detailed explanation of their content will be given (and discussed) orally in the presentation.
- Try to formalize the problem and the strategy adopted for its solution.
  Explain and not simply describe what you observed with simulations and eventually got through theoretical results.
- Always define the variables you use.
  Clearly write in the plots the quantities that are presented and the units on both axes.
  Figures and legends should be clear and concise.
  Use a technical language.
- In the final slide(s), summarize the main results and the message that you want to leave to the reader.
  Note that they do not need necessarily to be positive results, but can also be negative (e.g.: to know that a strategy that appeared promising in theory, later proved to be ineffective is an important result if you are able to understand why it did not work).
- Try the presentation before the exam: the final grade also depends on the clarity of your presentation.

At the presentation date, bring a CD/DVD/USB with all project deliverables (namely: MATLAB/C/Python... files, Simulink diagrams, source files of the presentation, any videos, images, etc.).