

Intelligent robotics milestones

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Course Policy: Read very carefully the instructions below as they are very important.

- Compulsory tasks **must** be achieved in order to pass the course.
- **One of the two optional** tasks **should** be achieved for obtaining a better grade.
- **The two optional** tasks **can** be achieved and would lead to an outstanding work.
- **Beware** that some MATLAB functions are forbidden and can thus not be used.
- During the exam, we will use your code on a new map. Thus, nothing should be hard-coded and your youbot should work for many different configurations. It is a good idea to test your code on modified house scenes (which you can get by playing with V-rep).

Milestone Navigation

(2 compulsory, 1 optional tasks)

For this milestone, you should build a custom controller for the youBot, which should use its holonomic properties. In particular, **we do not allow the use of MATLAB's pure pursuit controller**.

(a - Compulsory): Explore the whole map (and build an appropriate representation), by accessing the GPS coordinates (i.e. `simxGetObjectPosition` can be used on the youbot).

(b - Compulsory): Same as (a), but `simxGetObjectPosition` can only be called once per minute (note that the exploration should remain fluid).

(c - Optional): Same as (a) but without calling `simxGetObjectPosition` at all.

Milestone Manipulation

(1 compulsory, 1 optional tasks)

For this Milestone, the youbot will need to access a "TargetTable" object, which position you will have to find thanks to the youbot's sensors. Note that this table is the same as the ones on which objects are initially lying. **To distinguish them, you can make the assumption that the "TargetTable" will always start empty (no objects initially lying on it).**

(a - Compulsory): The youbot should grab all the object on table 1, without any falling on the ground and put them on the target table.

(b - Optional): The youbot should grab all the object on both tables, without any falling on the ground and put them on the target table.

