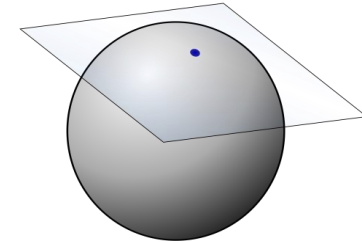




THE UNIVERSITY *of* EDINBURGH
informatics

Advanced Robotics

2 – Why are we here ?
15 Sep 2025



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Course objective:

Control a robot in an environment such that it accomplishes a motion task

We need to express all these notions rigorously, with maths.

Exercise: What do each of these terms mean to you?

Course objective:

Control a robot in an environment such that it accomplishes a motion task

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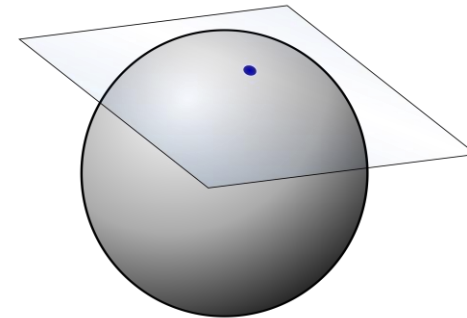
Let's put our hands in the mud right away with the tutorial environment

Course objective:

Control a robot in an environment such that it accomplishes a motion task

Model of the robot (and the environment)

- ❑ Geometry / Dynamics state
- ❑ Constraints (collisions, forces etc)



Mathematical definition of a task as a (differentiable) function

- ❑ $f(q) = 0$ means the task is satisfied

Motion generated using an optimal control formulation

Course objective:

Control a robot in an environment such that it accomplishes a motion task

Model of the robot (and the environment)

- ❑ Geometry / Dynamics state

Let's start with this

- ❑ Constraints (collisions, forces etc)

Mathematical definition of a task as a (differentiable) function

- ❑ $f(q) = 0$ means the task is satisfied

Motion generated using an optimal control formulation

Homework for next week

- ❑ Self run the python tutorial if you need
- ❑ Make sure your environment is setup on DICE and run tutorial 0
- ❑ Ask questions on ~~Piazza~~ EdStem if you do not understand something