

Week 4

Dr. Yuhao Jiang

Reconfigurable Robotics Laboratory

EPFL, Switzerland

Technical Requirement

1. **Closed-loop system:** Your device must **sense, process, and regulate in real time**. Pure on/off or open-loop behavior is not sufficient.
2. **Minimum components:** At least **two actuators and two sensors**. You may use the same actuator type if it performs distinct functions.
3. **Novelty relative to past projects:** Your project must not overlap in functionality with previous ME-420 projects. **Simply changing the application context without adding new functionality is not enough**. You're welcome to add meaningful new capabilities to make it distinct.
4. **Real, meaningful problem:** Your project should address a **genuine, well-motivated challenge**. Please avoid “fabricating” a problem just to fit the assignment—justify the need with a clear use case, users, and expected impact.

Grading

- 70% Project (20 % Final Report, 20 % Final Presentation, and 30 % Working Prototype Demo)
- 30% Participation (Weekly presentations + participation, mandatory!)
- Bonus (+10 on prototype): recycle at least 3 key parts (controller, motor, sensor, etc.) from previous projects

Demo Day Grading Scales
Cohesive Scenario (10%)
Clear motivation and communication for the need of the product (10%)
Concept novelty (20%)
Maturity of the prototype (20%)
Application of novel technology (20%)
Poster (content and design) (10%)
Videos and other visual aids to communicate better the concept and working principle (10%)

Final Presentation Grading Scale
Organization (20%) Clear goal Clear engineering approach Clear solution selection Timing
Presentation (30%) Audible and confident presentation Cohesive and coherent slides Visually and content-wise illustrative slides Well-practiced talk
Technical Quality (40%) Clear engineering specifications and approach methods Good solution with clear justification Clear presentation of pros and cons of the suggested solutions Analytical and engineering approach to the solution Present and defend the design options during Q&A
Project Participation (10%) Active weekly TP participation Team effort Quality improvement over the semester

By this week

- Slide 1: clear statement of the scenario i) need ii) novelty of your design in comparison to the state of the art iii) impact of the product

By this week

- Slide 2: Define at least three R categories and create engineering specifications with numbers (with a specific range that fits your application) – create a table.

R category	Engineering specification	values	Solution A	Solution B	Solution C
Reuse for 3 applications require large range of motion ie Watering & cat feed	Range of motion	end effector hinge range Vertical displacement Personalization etc			
Reduce – more payload to reduce the size of the links	Overall payload	Vertical / dynamic /continuous load etc			
Refuse – bandwidth is higher to be effective in ...	Bandwidth	motor bandwidth Control bandwidth Feedback speed etc			

By this week

Slide 3: three solution directions (some sketches with the chosen actuator and sensor)

- → show how they are all satisfying the motivation and functionality of the proposed product

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