ME430: Mechatronic Systems
Three Project Ideas

For the project, remember that you need to sense something from the environment, make control choices based on these inputs using a microcontroller, and use the microcontroller to drive some physical outputs.

3 Ideas for Week 2

Each team is to pick 3 ideas to develop in a bit more detail, and describe each idea in a one-page document.

Each one-page idea document should include:

-- Title for the project
-- A brief description of what your project is and how it works
-- Sketch of project hardware
-- A list of inputs that your project will sense
-- A list of outputs that your project will control
. --Any concerns you already are thinking about

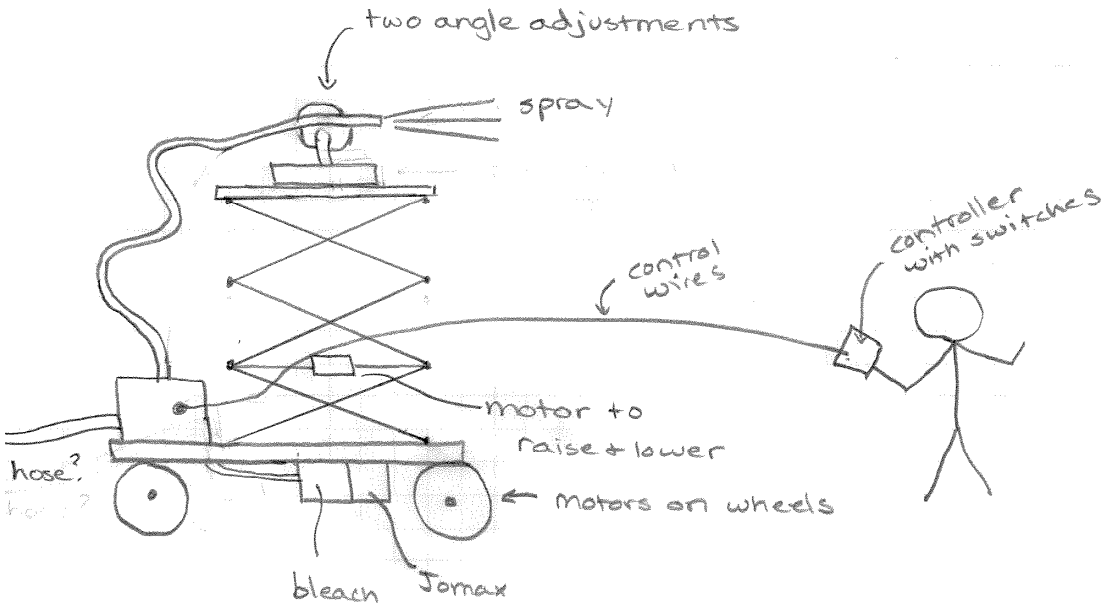
This can be done by hand or by computer, but you will need to develop one idea more thoroughly for Week 3 and it may save you some time to draft the preliminary ideas on the computer as well.

You can see a sample of an overly ambitious but well-formatted idea write-up on the next page.

Title: Wash-bot, a house washing robot

Description: We have a very tall (about 25' walls) two-story house. It gets dirty and mildew gets on the clapboard siding and needs to be cleaned off. We clean it with a solution of bleach, Jomax, and water sprayed at low pressure, then rinsed with clean water. This is a nasty job that involves climbing very high on a heavy ladder and spraying bleach solution and water over your head (to get at the eaves). Wash-bot will let me do this job standing on the ground.

Washbot should be self-propelled, and allow me to control it while standing on the ground. It should let me choose whether I am spraying cleaning solution or water, and allow me to adjust the spray head so that it points at the location I want to spray. It will need to be able to raise the spray head fairly high, around 25'. If possible, I would like to add a video inspection camera to let me look closely at a surface to see if it needs more cleaning or if it needs paint.



Inputs to the µProcessor: carriage speed and direction, nozzle height and two angles, switch to choose cleaning solution or water
Outputs from the µProcessor: motor speed for left side of carriage, motor speed for right side of carriage, two on-off valves to allow the flow of cleaning solution or water, height adjustment motor, angle adjustment motors.
Known concerns: How to power the robot? Should we carry all the fluids on the carriage (and therefore need pressurization), or connect to a hose? How to measure and dispense the bleach and Jomax?