Step 3 – Detailed CAD model

- Due Oct 12 by 11:59pm
- Points 100
- Submitting a file upload
- File Types pdf

The goal of this CAD model is to complete the design details, evaluate the feasibility, and to spot problems and incompatibilities in advance.

Include ALL major and minor features and components. Major components include battery, Raspberry Pi, motors, power conditioner, motor controller. Minor components include motor brackets, motor and PCB mounts, bearings, holes for thermoplastic screw inserts, cables and cable harnesses, nuts, bolts, washers, spacers, covers and fairings. EVERYTHING should be in the model. Revise concept if necessary.

Incorporate generous fillets for stress release and lightweighting. Include holes for lightweighting, cooling, and accessibility. Think about weight balance and stress loading. Use modularity to make your design more adaptable and printable. Use standard components and use the same screw sizes as much as possible to minimize your bill of materials (BOM). Use thermoplastic inserts for all direct bolting into plastic. Use stiffeners to make your design stronger.

Present your model in PowerPoint in Monday meetings. Include photorealistic rendering with representative materials, from various angles. Show animation video of the robot moving to illustrate your idea. Include drawings, cross sections, exploded views, pictures of individual modules to be printed.

Hand in:

A PowerPoint presentation of your CAD model. Insert your screenshots and images into the PowerPoint at maximum size and resolution possible. Add textboxes with name of concept, robot specifications, such as estimated speed. Add labels and text boxes to explain main components and features of your concepts. Consider adding multiple exploratory views, of various parts of the concept, context rendering, photo realistic renderings, exploded views. For example, show the robot in different poses. Videos of animation should be embedded in the PowerPoint and start automatically. Add drawing and bill of materials.

Append this assignment's slides to all previous slides from previous assignments. This assignment should be last, starting with a clear title slide. Save everything as a single PDF and upload the PDF. Any movies should be shown as a representative video frame plus a link to a video online.

PowerPoint Format:

1. Page 1: Title slide: Robotics Studio MECE 4611, Semester, Assignment 3, Full name(s), UNI(s), Date/Time Submitted, Grace hours (before submission, used/gained, after submission), Title of robot, General robot Rendering
2. Pages 2-X: Renderings as described above

Grading

Grading of this part is incremental. You get points for various aspects and the more you do the more you get. You can get more than 100 points. Following are tentative rubrics you can receive points for:

1. 5 Points Title slide complete
2. 5 Points overall aesthetics, layout and formatting of the slides
3. 10 Points posting some cool renderings of your detailed CAD on Discussion Boarda (show screenshot)
4. 8 Points 3D Renderings in perspective
5. 8 Points all key components included and labeled
6. 8 Points organic shape (no straight edges)
7. 8 Points photorealistic rendering
8. 8 Points animation
9. 8 Points exploded view
10. 8 Points key specs listed including speed, weight
11. 8 Points multiple poses shown
12. 8 Points detail close-up shown
13. 8 Points side views with main dimensions
14. 8 Points Bill of materials