

Milestone #1 – Preliminary Vehicle Designs, Brainstorming, Sketching

DUE: 20 February (along with Milestone 2)

DESCRIPTION:

The goal of this first milestone is to get you in the vehicle design mood and start you thinking about the kind of vehicle you want to build. For the first few weeks, you will be focusing on designing the vehicle and modeling it in Solidworks.

The first step is to gather an idea of what kind of vehicle you want to build. Some questions you might ask include:

- How many wheels, and where are they placed?
- What is the frame layout like – where, roughly will major components like batteries and controllers be mounted? What is the overall shape of the vehicle? Do you sit or stand?
- What (if any) of the competitions are you targeting? What specific design aspects need to be present (e.g. aerodynamic and sleek for good endurance racing, very high torque ability for drag races, lightweight for least rolling resistance...) to be successful at that goal?
- What mechanical subsystems might you need for the vehicle? Examples include steering linkages, differentials and drive shafting, suspensions, etc.

This list is, of course, not exhaustive. For now, you can assume that appropriate motors and parts exist for your design, since it is not a detailed plan you are creating, but putting your ideas down on paper. You may discover later that some aspects of the design have to be changed or compromised to fit the parts you have.

Your notebook should reflect the result of this thought process. Sketches, descriptions, labeled and commented drawings, pictures and renderings if you feel so inclined. Try also visualizing and sketching the subsystems like the drivetrain by itself. Come up with a few vehicle designs! They do not have to all be the same or different types, but all should reflect what you think is reasonable to build based on your experience or your goals. Try creating at least three.

FORMAT OF DELIVERABLE: Several (3 – 5 is a reasonable range) pages in your Design Notebook showing your three or more vehicle designs with related sketches if applicable.

OTHER ACTIVITY: Friday office hours (02/05) will focus on parts and resources introduction and general high level design questions. Check out the existing/previous student vehicles if you haven't already (ask Charles for details).

RESOURCES:

<http://www.evalbum.com> The EVAlbum is a great resource for “idea harvesting”. Try searching by Make or Type, and selecting the type of vehicle (e.g. karts) to view the entries. Don't be surprised if you accidentally find one of my vehicles.

<http://www.instructables.com/id/The-New-and-Improved-Brushless-Electric-Scooter-Po/> This is an Instructable document I put together for the general Instructable and internet community. It serves as a reference guide and recommended practices document. You may find it very helpful to thumb through.

<http://www.instructables.com/id/How-to-Build-your-Everything-Really-Really-Fast/> Another “design and build” resource I assembled to aid projects using rapid prototyping technologies and general discussion on how to assemble robust systems quickly.