Final Project Guidelines ME 412

Objective

The objective of the project is to engage in deeper learning of fluid dynamics principles by exploring an area of interest.

Topic

You may select to focus on any topic within the umbrella of fluid dynamics. Some wide ranging examples include: frisbee aerodynamics, fluid dynamics of blood flow, supercavitating submarines, etc.

Team

You will work on a team of 2 people. If you have an idea of larger scope (or if we have an odd number of students) you may work on a team of size 3. You will self-select your own teams. You may want to use Piazza to discuss ideas and find team members.

Exploration

You will work with your team to learn about and explore your topic in depth. This may include, but is not limited to, reading research articles, developing or using existing simulation capabilities, performing design and analysis studies, conducting experiments, and building prototypes.

Final Deliverable

The final deliverable will be a creation to teach others about your area/application of interest. The medium of this creation is up to you. Some examples include: a report, a presentation, a blog, a website, a video, a series of interactive quizzes, a podcast, a simulation tutorial, a combination of tools, etc. Choose a medium that you think will be effective and engaging for your topic.

The final deliverable should be publicly available unless extenuating circumstances apply (like working on a research area that is pending publication, in which case you need to obtain prior approval with me). Why? You tend to product higher quality work with a public audience, and you will be able to make a more significant impact for good. Who knows—you might design a game or simulation that ignites an child's interest in jet engines, a video that inspires a high-school student to learn more about engineering, a report that helps a fellow university student understand a difficult concept they previously struggled with, a design tutorial that enables a young professional to enter a new hobby. Find an appropriate public venue to share your project (e.g., YouTube, GitHub, WordPress, SlideShare, our course website, etc.). Come discuss with me if you need some input on where to host your project.

Guidelines

The important guidelines for this project are:

1. Choose something you are interested in and excited about!
2. Plan an appropriate scope and division of activities so that each member of your team can contribute effectively.
3. Create! This must be a creative work. It is not sufficient to simply summarize existing knowledge like a book report. On the other hand, you don't need to create new knowledge like you would in a research project, although those types of activities would certainly qualify. For example, suppose you chose to explore hand-launched gliders. You might study existing glider designs and relevant aerodynamic principles, develop a simulation tool to help you design an aircraft that can glide as far as possible,

and build a glider or two to test your design. You would not be creating new knowledge about the physics of gliding, but your creation would be a design process and simulation tool that would allow kids to follow along and build their own gliders at home.

Deadlines

- One the second or third homework you will be asked to submit a list of your team members and the project topic. Start thinking about what you'd like to work on.
- In the last week we will have group presentations. You will have 4 minutes to showcase your project to the rest of the class.
- The final deliverable will be due the last day of the semester via Learning Suite. You can either submit a link to the project in Markdown format:

  - [link description](url)

  or if is to be archived on our course website you can upload the file(s) directly.

Grading Criteria

I will judge your submission on three criteria:

- **Quality:** Is your project clear, well-organized, and accurate?
- **Impact:** Is your medium and presentation style likely to enable effective learning for your users?
- **Depth:** Do the explanations and visuals lead to real insight or only superficial information exchange?

Request for Funds

I have obtained a small budget that I would like to use to support projects in this class. To be clear, you don't need to purchase anything, and for the majority of folks I don't expect you to need any materials beyond those already available within the university. But if do come across a small purchasing need for your project (e.g., a modest software license fee, some materials needed for your experimental study, etc.), please come talk to me and then I'll have you fill out a request form (pending availability of funds).