Team Formation + Project Proposal

Team formation [Due Feb 2 at 5pm]
1. Form a team of 2-3 people
2. One team member should email me and cc the other team members, and include the following information in their email:
   a. Team name (feel free to be creative)
   b. Names of team members

If you have trouble finding a team, that is not a problem — send me an email.

Project overview
As a team, you will propose and work on a project that will be worth 70% of your final grade.

Expected workload:
The project proposal is due Feb 16, and the final report is due Apr 26: there are 10 weeks in between. This is a 3-credit course. Per [university guidelines](#), this means students are expected to perform 6-9 hours of work per week outside of lecture hours — since we don't have homeworks or exams, these hours will all be dedicated to project work. Keep this in mind when you are thinking about the scope and difficulty of your project. Pick something that is not too easy, that you think you can reasonably finish by the end of the course. Remember that you will have a chance to adjust the project goals (if needed) in March, on your progress report.

Criteria:
The project must be related to (1) control theory and (2) biological sensorimotor control. You may use any tools from control theory to analyze or model some aspect of biological sensorimotor control.

Some ideas:
If you don't know where to start, begin by reviewing class slides and papers you were exposed to during the paper review. See if there are ideas in there that you are interested in exploring or diving deeper into. What are the things you are curious about? How can these be formulated mathematically? You are also welcome (and encouraged) to use generative AI to help you generate and scope ideas.

A basic project idea could be to replicate the findings of a theoretical paper. Depending on the paper, this by itself could be one semester's worth of work, or it could be shorter. You could also take a control circuit from a paper and expand it or alter it in other ways to see how it behaves, and what that says about sensorimotor control.

Project proposal [15% of final grade] [Due Feb 16 at 5pm]

Submission: One person from each group must upload a PDF file as a note on Piazza

Format: LaTeX article, 12 point font, 1 inch margins
Suggested header:
```
\documentclass[table,12pt]{article}
\usepackage[margin=1in]{geometry}
```

Tip: Overleaf is the most accessible way to use LaTeX, and it also makes collaboration between team members easy. It is also the platform most researchers use to write papers.

All sections should be written in a way that they are generally understandable to someone with a broad STEM background (e.g. your classmates). After reading your proposal, the reader should be able to understand what you are doing, why you are doing it, and how you plan to do it.

Required sections:
1. **Title page (1 page)**
    a. Project name
    b. Team name
    c. Team members names
2. **Team charter (1-2 pages)**
    a. **Biographies:** For each team member, include a small photo and 1-3 sentences about the team member (e.g. their academic background, preferred name, interests, hobbies etc.).
    b. **Vision statement:** Describe the goals of the team. What do the members hope to get out of this class project?
    c. **Responsibilities:** What are the responsibilities of each team member? What can each team member expect from one another (e.g. to be responsive, to do their best to meet internal deadlines, etc.)?
    d. **Communication plan:** How will team members communicate with each other (e.g. email, text)? How often?
    e. **Conflict resolution:** How will conflicts be resolved? What should a team member do if they feel there is a problem?
    f. **Meeting plan:** How often will the team meet? Where will these meetings occur? Who will set the meeting agenda? Identify at least one 1-hour slot when everyone is free to meet (e.g. 4-5pm Wednesdays).
3. **Introduction and motivation (1-2 pages):** Here, you will provide context and background knowledge for your proposed problem. Why is this problem interesting? What do we already know about this problem? What are some related problems or results? You must include at least 5 citations to relevant papers or textbooks, and also demonstrate that this problem is relevant to some aspect of biological sensorimotor control.

4. **Problem description (1-2 pages):** Describe the problem you are trying to solve, or the question you are trying to answer. Formulate the problem as technically as you can (in terms of equations), and clearly indicate the control theory tools you plan to use.

5. **Planned approach (1-2 pages):** Describe the steps you will take to solve this problem. Break the problem down into smaller, manageable problems.
   a. **Timeline:** A week-by-week breakdown of tasks, from the week of Feb 19 to the week of Apr 22. Remember to make room for preparing your progress report, final presentation, and final report. Clearly indicate which team members are responsible for which tasks, and dependency between tasks. For example, if team member A is responsible for finding a numerical model of a spinal circuit, and team member B is responsible for coding up that circuit in MATLAB, then there is a dependency here.
   b. **Anticipated challenges:** What are some technical challenges that you anticipate facing? What are some strategies/workarounds you could take to overcome these challenges? For example, if you cannot find a numerical model of a specific spinal circuit, you can take an educated guess at the model, or pivot to a slightly different circuit. If you want a linear model, but can only find nonlinear models, you can linearize.

6. **Goals and evaluation (1 page):** How will you evaluate whether you have successfully completed the project? What are the criteria for success? Be as specific as possible.