Semester Exercises Nx-423

Summary Exercise - Project

As one core component of the course, you will be tasked with developing an innovative, disruptive, clinically oriented project proposal involving a novel application or improvement of a neurotechnology. You will be provided with a general framework to guide your thinking, including aspects such as addressing unmet clinical needs, neurotechnological approaches, and considering ethical, regulatory and entrepreneurial implications.

Project Guidelines:

- **Innovation and Disruption:** Proposals should introduce groundbreaking ideas that challenge the status quo of current practices. You should feel free to propose ideas that may currently seem speculative, you are encouraged to propose bold and unconventional ideas, thinking outside the box to challenge existing paradigms in neurotechnology, neuroengineering and its clinical applications.
- **Unlimited Budget Scenario:** While you should aim for practical and impactful solutions, you are encouraged to think expansively and creatively, imagining your projects with no financial constraints
- **Clinical Relevance:** Projects must have a clinical focus, addressing a specific neurological or psychiatric condition, cognitive function, or other health-related outcomes.
- **Feasibility and Impact:** While thinking big, you should consider the potential feasibility and impact of your proposed technology, including patient outcomes, scalability, and integration into current healthcare systems.
- **Group Collaboration:** You will form groups of three/four to foster diverse perspectives and multidisciplinary approaches to the project. Collaborative teamwork is essential to develop a comprehensive and innovative proposal.
- **Presentation and Defense:** At the end of the semester, you will present as a group your proposal in the course, simulating a pitch for funding or approval. You will need to defend your ideas in the view of the current background and demonstrate how your proposal could transform the field.
- **Supervision and Guidance:** Throughout the semester, each group will receive supervision and guidance from a teaching assistant (TA). The TA will provide support in refining ideas, ensuring scientific rigor, and offering feedback on project development. The exercise time and potential meetings with the TA will help groups navigate challenges, enhance their project proposals, and prepare for the final presentation. After the 3rd week you will provide an extended abstract of your project idea, for which you will receive feedback from the teachers to help you to stir the project.

This project/course will help to empower you to push the boundaries of what is possible in translational neuroengineering, fostering an innovative mindset that could lead to the next breakthrough in this field.

Evaluation Guidelines:

- **Written project report for the final grade:** 20%
  - 12 pages including figures (excluding reference list)
  - Your written report should be concise, well-structured, and supported by relevant scientific literature, please follow the structure below
    - **1. Introduction**
      - Clearly define the clinical or scientific problem being addressed
      - Explain the clinical or research relevance (e.g. unmet needs, patient impact)
      - Brief overview of existing treatment strategies and their limitations
      - State the goal of the project
    - **2. Suggested Solution / Proposed Strategy**
      - Describe the novel strategy/technology you are developing or exploring
      - Provide scientific rationale: Why could this be effective?
      - Mention if it's based on existing approaches, adapted methods, or an innovative total novel concept
    - **3. Implementation and Methodology**
      - Outline the main steps/methods towards the novel innovative solution
      - Include diagrams or figures if helpful
    - **4. Presentation and Discussion of Results**
      - Present novel technology/strategy
      - Discuss how your solution compares to current standards or alternatives
      - Highlight advantages, potential challenges, feasibility and limitations
      - Future direction

- **Project presentation for the final grade:** 40%
  - Evaluation criteria for the presentation:
    - Background knowledge
    - Proposed solution
      - Innovation, disruptiveness
      - Feasibility
    - Readiness/responses to answers
    - Presentation skill and slides