**Mock Honors Experiential Learning Project Proposal**

**Basic Information**

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College: College of Engineering and Applied Sciences

Major: Mechanical Engineering

Title of Project: Robotic Hand Research—Starting the Future

Thematic Area: Research

Expected Project Start Date: Beginning of Fall 2015

Expected Project End Date: End of Summer 2017

**Project Information**

1. Provide a detailed abstract of your proposed honors experiential learning project

For this project I will be establishing a small research team consisting of one to two other students as well as one to two faculty members to investigate the dynamics of a robotic hand and arm. The initial task of this project will be thorough research into the background of studies already conducted in this field in order to narrow my project’s specific focus to be unique. In general, once physical research begins for my team, we will first discover the mechanics that allow the physical functionality of the robotic hand and arm. We will start with a basic model (as in attachment to a glove) and move towards a more complex model (fully computerized). After gaining an understanding of the hardware and software contained in these machines, my team will choose a new design and move towards fabrication. We will then test this new model for various features such as strength, mobility, and efficiency. It is difficult to give an exact account of how many hours will be spent on this project, although with the extent of my intended tasks it will require an extensive amount of time that will satisfy and exceed the hours requirement. For my long-term career goals this project would be immensely helpful. My desires rest in the exploration of smart prosthetics and exo-suits. This project will allow me to gain a deeper background in the basics of this field which will serve as a launchpad for my future studies (be it graduate school or profession).

2. Connection to Learning Outcomes within the Honors Thematic Area

* Possess a well-developed awareness of literature in the field

In order to make the most of this research opportunity, it is essential to first understand what research has already been conducted on this topic. Although robotics is a relatively new field, it is rapidly growing and phenomenal developments have already been made. By conducting a period of intensive preliminary research, it will allow me to gain a deeper grasp on the field of robotics as well as narrow my project’s focus to be unique and meaningful.

* Awareness of weakness and limitations to provide guidance for future research on this topic

As this project will be my first foray into a field that I have a strong desire to pursue further, understanding the victories and the subsequent losses will help make my future work more productive and meaningful. There is always room for improvement and growth, and I believe that actively keeping this in mind is the best way to guarantee a positive takeaway from the project.

* Disseminate the research results and knowledge gained

As research as well as robotics are areas that are highly centered on collaboration, post-project communication is extremely important. By recording your results and potential discoveries, you not only make the project permanent in time but also contribute to pushing the field forward. As a final note, making a point of accurately disseminating the details of my project will help with later recall and discussion.

3. Connection to Goals and Academic Theories (include reference list, as appropriate)

 A. Contribute to goals and personal development

As previously stated, this project has direct ties to my future desires and goals. I am interested in further exploring smart prosthetics and exo-suits in my further academic and professional career so this project will give me an incredible introduction into this field that will help set me on a path for success.

 B. Connect to academic theories

At the outset of this project there are not any specific academic theories that will be focused upon. However, as the preliminary phase of investigation into previously conducted research occurs, we will come across leading theories concerning this aspects of robotics. These discovered theories will not only provided critical background knowledge but will also help to guide my own project’s final direction.

4. Initiative, Independence, and/or Creativity

As the leader of a small research team, I will be responsible for determining the project direction as well as delegating tasks to my various team members. I will attempt to focus on fostering collaboration amongst my team in order to allow smooth team dynamics as well as to achieve the greatest overall result by implementing many of the concepts I learned in a previous Honors Seminar, Collaborative Leadership. This project will be an exposing endeavor for me in a topic with a decent amount of previous research contributions, although the initial period of investigation will allow me to fine tune this project to do further analysis into a unique mechanism or functionality that is new or comparatively under-researched.

5. Reflection

One topic that is extremely important for a project of this magnitude is active reflection. My plan is to keep both a journal as well as a work log. I will write in the journal frequently (at least once a week) and will focus on general updates, any challenges that my team is working through, exciting developments, and team dynamics. The work log will be a running tab that will document any contributions that get done to the project. This may include anything from internet research on previous designs to hands on development. The intention with the work log is that it will keep a remarkably accurate account of events as the project develops which will enhance the effectiveness of the steps I will take in dissemination. I am currently considering the possibilities of either a team work log, individual member work logs, or a combination of the two. Both the journal and the work log will help to ensure that my project does not side-wind or devolve into a mediocre research experience. Finally, the reflective essay that I will write at the conclusion of the project will bring everything that was discovered (both from a research and individual standpoint) together into one cohesive format.

6. Dissemination

My target audience for dissemination with this project is any individual interested in this specific area of the robotics field. The reason for targeting this audience is a hope that the results of my project will add to the progression of this field in some form of another (be it a new discovery, improved efficiency, supportive data to previous developments, or simply motivating and bringing awareness to the field). My method for dissemination is going to be a three-pronged plan. First, I will post my project’s results on my learning portfolio including the journal (possibly minus the team dynamic sections), team work log, a general statement as to the results, and my reflective essay. Next, I will print a copy of all of these documents, neatly compile them into a presentable format (either bound or put in a tabbed binder), and leave it in the Honors suite for interested readers. Finally, I will maintain electronic copies of all of these documents that I will be able to access and further make available whenever a need or an opportunity to share the results of my project arises.

7. Project Advisor(s)

The advisors for this project will come from the University of Cincinnati’s faculty that have expertise in the necessary areas of research for this project including: mechanics, electricity, and computer science (may use <http://www.min.uc.edu/me/people> to narrow down possible faculty).

8. Budget (if applicable)

The investigation of previous research half of this project will not require any formal budget, although the physical research portion will. The primary costs will derive from supply costs of materials used in fabrication. A rough estimate will be established after the first stage of background research is begun and will be refined as more background research is conducted and the direction of my project is narrowed.