

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant has demonstrated a strong background in many facets including computational (particularly with programming) and theoretical and has an established research record related to the work that is proposed. The letters collectively indicate that the applicant has the skills needed to excel in both an academic setting as well as engage in original research. The project itself, dealing with nanocoils seems a continuation of work done at an REU. The positive side is that it indicates that the applicant is familiar with the area; at the same time it would be good if the presentation were broadened to include a wider field of topics.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

The applicant has identified themselves as part of an under represented group and wants to become a role model for others from the same under represented group and work in networking and advocacy. The applicant has already done some mentoring through a coding activity. The ability to increase participation from under represented groups is valuable and makes a strong broader impact. One suggestion is that the applicant has very short term (e.g. continuing on in working with coding projects) and long term (e.g. advocacy) but does not have a clear picture of more of the medium term. An idea of what the applicant would do to mentor people and motivate more people from under served communities following graduate studies would have made a stronger presentation.

Summary Comments

The applicant has an excellent academic record and a good research track record. Their previous work has demonstrated that they have the skills needed to excel in graduate school, and their background indicates that they will not just succeed academically and in research, but will have a broader impact on increasing participation from under represented groups.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Very Good

Explanation to Applicant

The applicant has an outstanding academic record in undergraduate program as well as relevant research experience related to the proposed research topic. The applicant has conducted undergraduate research at Cornell University on optimal control and dynamic system and learned a dynamical model of highly flexible springs. The applicant has shown impressive accomplishments in research including publications and presentations. All references support the applicant's intellectual ability to lead interdisciplinary research project. The proposed research is to develop a bifurcation theory of path-constrained optimal control extremals and the applicant has prior research experience with MATLAB closely related to the proposed research at Cornell. This prior research at Cornell will enable the applicant to do the proposed research.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

The applicant had mentored undergraduate students as a tutor. The proposed research has positive aspects in computational chemistry, computational biology, and optimal Control problems. The applicant had explained how the proposed research and other activities beyond academic activities (publications and presentations) result in broader impacts, "I will use toy Slinkies to demonstrate this work in K-12 outreach settings, thereby helping to inspire the next generation of scientists"

Summary Comments

The applicant has the similar research experience, strong background of computational skills, and enough knowledge of chemistry and optimal control problems. The proposed research is based on the prior research results at Cornell so there is good/positive potential for the applicant to perform the research successfully even though the applicant doesn't mention clearly how to the proposed research results will have broader impacts in other research areas. The proposal has been written in an organized way scientifically and the applicant appears to be very well prepared for the research

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Very Good

Explanation to Applicant

This is a very strong application. The applicant has an stellar track record, both academically and research wise. She has maintained a GPA of 4 and has co-authored a major journal publication. The research topic is on the optimal control applied to shape optimization of nano tubes. This is a very challenging research plan; however, given that this is an active area of research, the applicant should have more clearly highlighted the new aspects of the research plan and discussed the novelty of the proposed approach.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

The applicant is well prepared to carry our the research project. She has an excellent track record which makes her well equipped with programming and mathematical skills. The applications of the research plan is broad and from bio-sensors to flexible electronics. Overall, this proposal tops all the proposals that I have reviewed this time.

Summary Comments

This is an excellent proposal by a very strong applicant. Her academic and research track record is stunning. The research plan is very well written and the applicant is well qualified to c carry out the proposed work. However, the weakest aspect of the proposed research is that the new ideas and novelty of the mathematical approaches are not clearly described. Highlighting the original ideas and discussing the new aspects of the proposed research plan will make the proposed work stronger.