

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant is currently an undergraduate student at SUNY Buffalo. The applicant has good academic record and various honors/fellowships, including Barry M. Goldwater Scholarship, UB Presidential Scholarship, Mechanical and Aerospace Engineering Humanitarian Award, and Grace W. Capen Academic Award, to name a few. The applicant also worked as NSF REU Research Assistant before. It seems that the applicant has previous research experience, and it has resulted in four conference presentations and two papers that are under review. Overall, the applicant's research plan is well thought out, demonstrating high potential for future achievement in engineering. Collectively, the applicant's reference letters are very strong in terms of demonstrating the potential of the applicant.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

The applicant has been involved in several activities/societies, including as a volunteer for the Buffalo Public Schools. The applicant seems to be committed to broader impacts, not only as a result of carrying out the proposed research with an ultimate goal of impacting on people's lives through the advancement of technology, but also through providing mentoring, leadership, and role model to other public school students.

Summary Comments

This is an outstanding proposal. Both Intellectual merit and broader impact aspects are very strong. The applicant's references offer strong evidence of applicant's potential success. In this reviewer's opinion, the applicant has demonstrated high potential for significant achievement in engineering.

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Explanation to Applicant

The proposed work, if successful, will certainly bring much excitement into robotic research that would lead to ubiquitous deployment in a host of work setting. Not only will the work prove intellectually inviting but will also lead to researchers to explore the use of robots and robot collectives in an unimaginable multitude of tasks and setting

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

The benefits of developing intelligent robots capable of working collectively to pursue and complete purposeful work are enormous. Such capability will relieve mankind from engaging in risky activities or environment to would ultimately improve

the welfare of society.

Summary Comments

The scope of the proposed work is far reaching. The PI is proposing the development of intelligent robots that can collectively cooperate and collaborate in construction activities in an unstructured domain. The work will involve the development of special mechanical components, intelligent control system, and algorithms for robots working together for a purposeful end. The proposed work represents what robot researchers had always hoped for that robots can someday be deployed to perform a host of tasks normally performed by humans in a host of environment, particularly hostile and hazardous environment. It is a monumental task but nonetheless, the ultimate goal of robotic researchers is to attain this goal. The proposed work is innovative and transformational. It has the potential of transforming of how people work and plan for work. In fact, it will change the concept of work from that of tediousness and unpleasant and tasking activity to one of intellectual exercise and joy. The applicant is well qualified based on past experience, to pursue the proposed work. He has the enthusiasm and motivation to pursue the work. Furthermore, he has the experience and evidence to prove it that he has the background to accomplish, at least, some aspects of what he has proposed.

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Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant has an outstanding academic record, excelling in all course work and obtaining a well-rounded and appropriate knowledge base covering Mechanical Engineering, Computer Science and Bio-Inspired Systems for his intended work in robotics. He has shown initiative, leadership and the ability to perform independent research through Science Olympiad and REU activities.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

The applicant has demonstrated interest in reaching out to improve the STEM pipeline and earned accolades for such efforts. Suggestions for the future include increasing publicity and demonstrating interests to media and general public.

Summary Comments

Applicant has demonstrated initiative and academic excellence, taking advantage of available opportunities. Applicant appears to have a thorough understanding of research and is ready to hit the ground running as a grad student.