Score for Buchan, Austin

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Very Good

Explanation to Applicant

By working on a number of projects in Robotics, the applicant has demonstrated his skill to work with both the hardware and software. He has worked on most of these projects as a member of a team. His plans for communicating the results of his research are good. He has presented the results of his project at a conference.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Fair

Explanation to Applicant

The applicant has been involved in robotics demonstrations to Girl Scouts and other students. There has not been significant involvement with under-represented groups or in other extracurricular activities on campus and outreach activities.

Score for Buchan, Austin

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

– For demonstrated ability to plan and conduct research; ample evidence of leadership is shown at various levels including being (even as an undergraduate student) the de factor leader of the CMU Robotics Laboratory composed of research scientists as well as graduate students; besides being the project leader for CMU's Colony Project. Work so far on variety of topics has led to public-like demonstrations but not yet a single archival quality publication, although a symposium paper is cited. Applicant has shown stellar academic performance across the board.
– Very strong evidence is provided or the demonstrated ability to work as part of a team as well as independently. Multiple examples are provided including those of team building, then leading the team, and well-liked to being appointed as laboratory leader for a faculty's lab at CMU.
– The applicant has shown the ability to start multiple research programs and for successfully initiating 9 CMU-funded internal research projects. Thereafter, for interpreting results and communicating to various audiences, including to the Girl Scouts for use of robots to meander their way through. However, these all appear to be for internal audiences and to one locally-held symposium and another at a talk at U.Penn. but not at international conference or journal venues. The applicant is encouraged to move further outwards for disseminating his results and ideas. A reasonably good case and/or justification are missing for why applicant wishes to pursue a PhD program at the chosen institution.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

– For effectively integrating research with education at all levels evidence is strong; applicant also instructs for a CMU course to students while still an undergraduate student which says a lot about credibility assigned to him by faculty at CMU. However, the audience group to which it is disseminated is largely at CMU and considering the breadth of data and results cited, it would be appropriate to reach out to international conferences and venues.
- Improved evidence compared with other strong candidates is recommended For efforts at engendering diversity and opportunity for minorities; some evidence is offered that applicant interested local Girl Scouts to get excited about robotics work and potential.
– Applicant produces visionary (per his mentors) ideas for enhancing the field of robotics that few individual could appreciate in the normal course of the funding cycle with various agencies. Details are somewhat sketchy but yet, substantial in terms of depth considering the track record of the applicant. – Broad-brush statements are presented by the applicant in relation to benefits to society at large. The research proposal is admitted by the applicant to still be in formulatory stage - awaiting further in-depth literature reviews, advanced graduate work.

Score for Buchan, Austin

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Very Good

Explanation to Applicant

The proposed research is on optimizing sensor-based perception architecture. The applicant's academic performance and experience in a Robotics Club will make him qualified to perform this line of research. The applicant plans to design robotic systems using dedicated real-time microcontrollers, embedded system networks, and FPGAs. The applicant also plans to strengthen his knowledge on specialized GPUs and neural networks. The applicant was involved in a presentation to an AI symposium.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Very Good

Explanation to Applicant

The research in itself has a broad impact in the area of robotics and computing technologies. One reference letter indicated the potentially strong impact on the domains of embedded systems and bio-inspired engineering. The applicant has held a leadership position in his university's Robotics Club. Parts of the responsibilities of the applicant include mentorship, technology demonstrations, and recruitment. The main research statement can be improved by adding concrete outreach and dissemination plans (e.g., publications, demonstration of results to K-12 students, etc.)