Proposal Panel 1 : 1829794

Agency Name: National Science Foundation

Agency Tracking Number: **1829794**

Panel Summary

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SUMMARY OF PROPOSED ACTIVITY

This project is led by the newly established Center for Interdisciplinary Scientific Computation (CISC) at Illinois Tech. The center is partnering with Argonne National Laboratory, Fermilab, College of DuPage, leveraging their combined resources to educate future computational scientists. This project plans to offer a thorough education to both CI contributors (CICs) and CI u (CIUs), with a potential to convert CIUs to CICs. The main goal of this project is to expose students to large-scale computation, software design principles, through hands-on experience. T project targets four different kinds of students: high school students, community college students, Illinois Tech undergraduates, and Illinois Tech graduate students through diverse activitie including summer school, course enhancement, summer research experience, and summer fellowship.

INTELLECTUAL MERIT

Strengths

+ The project establishes the summer course, strengthens existing courses, and adds new courses to create a good training ground for high school, 2YC, undergraduate, and graduate st

+ The proposal outlines a set of skills needed to become effective CICs and CIUs, and where and how those skills can be taught.

+ The project provides interdisciplinary nature with emphasis on CI usages that can render transformative results in both CIC and CIU training.

+ The proposed activities are well reasoned and justified.

+ The team is well qualified to conduct the proposed work with experts from multiple disciplines. The newly established CISC center builds on existing programming within IIT and is poise to support this project.

+The PIs point out that the proposed work mostly builds on their previous experience and that they want to go beyond what they have done in the past.

+ The project will share the results through articles, talks, and their website. The project will also make available the course materials, software packages, and code templates developed.

Weaknesses

- The proposed course material is somewhat conventional. For undergraduates there are modern topics that can be presented such as data analytics, cloud computing, heterogeneous computing. However, for K-12 students a more focused approach may be necessary and beneficial.

- The evaluation plan is not conducted by a dedicated evaluator and lacks dedicated budget.

- It is not clear how the summer course can encourage the students to pursue CS degrees, especially when aiming to reach underrepresented groups, and how to be distributed across th diverse levels of students.

Suggestions for improvement

The panel recommends that the PIs introduce a more diverse set of modern skills into their proposed courses, and assign a dedicated evaluator to evaluate the proposed activities with de budget. The proposal also needs to clarify how the summer course can reach underrepresented groups and different levels of students.

BROADER IMPACTS

Strengths

+ The proposal has a thorough presentation on broader impacts that articulates how to reach out to various constituents including high school students, community college students, and undergraduate and graduate students at IIT across various disciplines. The different levels of students will benefit from this project breaking the traditional silos.

+ The proposed project has partners in National labs and industries.

+ Courses developed by this project will continue in the curriculum beyond the end of this project.

Weaknesses

- The proposal lacks a specific plan to engage people from under-represented groups.

- The plan to share widely via conferences is ambitious. However, it will be challenging to reach communities at conferences the PIs typically do not attend.

- It is not clear how the program provides innovative course components that will be picked up by others.

Suggestions for improvement

The panel suggests that the PIs provide a specific plan to engage underrepresented students, and clarify how to share the project results. The project also needs to demonstrate its scalab the broader national community, and describes how users can contribute to sustainability model.

CYBERTRAINING SOLICITATION-SPECIFIC REMARKS:

1. Challenges addressed in training, education, and workforce development

This proposal addresses two major challenges of educating CIC and CIU across scientific disciplines: academic silos and lack of knowledge about good practices.

2. New modes of discovery and use of advanced CI resources, tools, and services in fundamental research enabled

The learning outcomes addressed in the proposal form a skill set that could potentially enable new modes of discovery and use of advanced CI resources and tools in fundamental researc

3. Advances in integrating skills in advanced CI as well as computational and data science and engineering into institutional and disciplinary curriculum/instructional material

The proposal lays out a plan for developing 16 specific skills in advanced CI for four different levels of students and integrates those skills into a summer computational science course, en courses, and additional courses.

4. Steps to broaden access and community adoption with respect to the Nation?s scientific and engineering research workforce and advanced CI

This project has partnerships with national labs and industry, and will reach out to high school students and community colleges.

5. Stakeholders engaged and partnerships forged for collective impact

The PIs have established a good set of stakeholders and partners in other universities/colleges, federal laboratories and nearby private industry.

6. Scalability to a large number of people directly and indirectly, and sustainability of key aspects beyond NSF funding

The proposal addresses post-award plans for sustainability including additional funding sources and expanded partnerships.

7. Plans for recruitment and assessment

The proposal articulates a plan for recruiting student participants, involving high school and community college students. The assessment plan is adequate.

8. Plans for management and collaboration

The project management and collaboration plans are also reasonable and clear.

Suggestions for improvement

The panel recommends that the PIs provide additional literature support or explanation of the rationale for the work, and should give more explanation on why they believe their recruiting strategy will be successful. The proposal also needs to provide a more scalable and tractable assessment plan.

ADDITIONAL REMARKS

* Data Management Plan

The data management plan is standard and reasonable.

* Relevance to OAC and to any Participating Directorates/Divisions

The goal of this project is to train computational scientists on multiple disciplines, including computer science, mathematical science, and natural science. Therefore, this project is very rel to both OAC and MPS.

* Suggestions for improvement to the extent not covered above

The panel points out that it may not be suitable to budget weekly lunchtime discussions. Also, the data management plan needs a discussion about the assessment of the program activiti
how that data will be collected, protected, and stored.

SUMMARY STATEMENT

The proposal proposes to establish a cross-disciplinary education program for training both CICs and CIUs, leveraging the resources of the newly established CISC at IIT and existing cou
IIT. The proposal is well written and organized. The team is qualified to do the work and has assembled an excellent group of stakeholders and project partners. The work plan is realistica
out. There is potentially high impact on enabling cyber training for CICs and CIUs from this work.

The recommendation of the panel is Competitive

The panelists concur that the Panel Summary accurately reflects the panel discussion.

PANEL RECOMMENDATION: Competitive