# Reviewer Comments

# Cybersecurity Scholarship-for-Service at the University of Arizona

## Context Statement

National Science Foundation
Directorate for Education and Human Resources
Division of Undergraduate Education
CyberCorps®: Scholarship for Service (SFS) Program

General Information for Applicants, FY2013

For the October 12, 2012, deadline, the CyberCorps®: Scholarship for Service (SFS) program received 99 proposals. Ninety eight of these, representing 75 unique individual or collaborative projects, were determined to be eligible for review. These proposals requested approximately $97 million. Of the $25 million allocated to the SFS program in FY2013, around $18 million will be available for new awards. These funds will permit support of approximately 6 to 9 Scholarship projects and 8 to 12 Capacity Building projects.

## Panel Summary

IM:
Strengths:
The panel likes the concept of a highly interdisciplinary program that is proposed.

The panel is in agreement about the experience and expertise of the PI and Co-PIs with respect to education, research, and grant management for the proposed program.

Weakness:
The panel feels the lack of a coherent and detailed execution plan for a highly interdisciplinary program is a concern.

The panelists felt that the management program does not address cyber security aspects to a level that would be appropriate for the knowledge, skills and abilities in demand in the federal workforce. Other panelists argued that students may lack technical skills, but there is room for students like these in the federal government.

Evaluation plan of proposed effort is not well defined and lacks details. Support for this effort is also lacking in the budget.

The panelists could not determine the level of overlap (cross-listed or otherwise) between the graduate and undergraduate courses have the same names but only differ in their course numbers.

The panel in general felt the lack of details about the academic program and course materials as they are not available in the project description.

BI:
Strengths:
The panel is in agreement of a strong recruitment program with attention to increasing diversity, ability to encourage research and research dissemination in various forms.

## Review #1

Rating: Very Good

Summary

What is the intellectual merit of the proposed activity?

The proposed program will produce forty cybersecurity professionals with a BS, MS or Ph.D degree. The MIS Department of the University of Arizona is a CAE-IAE. The proposed program is cross disciplinary that includes MIS and ECE. The PI and Co-PIs have education, research and grant management experience and expertise to successful carry out the proposed program.

What are the broader impacts of the proposed activity?

The proposed program will increase the number of cybersecurity professionals. It will typically increase the number of Hispanic population with security skills in federal, state and local governments. It can have a major impact on the IA and computer security education and research on the region.

Summary Statement

The MIS Department at the University of Arizona has very strong Cubersecurity undergraduate and graduate programs. The faculty members conduct research in broad areas. The proposal has a great recruiting plan that includes minority recruiting activities. The selection process and criteria are appropriate. The details of student mentors and activities are described in the student management and development plan. An experienced faculty research and mentoring team is formed. The elements of the evaluation are described. The proposed program is built on its existing Zipperman Scholar program for undergraduate students.
The proposal discusses various activities for internship and placement but does not mention NSF Annual Job Fair.

## Review #2

Rating: Very Good

**Summary**

What is the intellectual merit of the proposed activity?

The proposal focuses on establishing the Cybercorps program in the context of an MIS school. The aim is to strengthen the existing program through the scholarship program.

What are the broader impacts of the proposed activity?

The project will target Arizona minorities and former military personnel. Military personnel is an important target, and I think it may have important benefits to the US army and society at large.

Summary Statement

The proposal is complete and comprehensive, the program will be placed in a successful school which already has in place means to attract and retain successful students. The resources available will facilitate the success of the program.
The weakest part of the work is the evaluation, it is not clear to me who this evaluator is and how they will be recruited.
Also, the plan for undergraduates seem well-thought but I wonder about its realism (exp. requiring all students to publish and present at conferences).

# Review #3

Rating: Very Good

**Summary**

What is the intellectual merit of the proposed activity?

The proposed effort is to build a SFS program at University of Arizona in the MIS department, with a budget request for total 40 students. The effort has assembled an interdisciplinary team from computer engineering, MIS, and computer science that have a strong track record for education and research in several information security related areas. 4 UG, 4 MS and 2 PhDs as a cohort each year for first three years and 5 UG and 5 MS in fourth year.

Intellectual merit

Strengths:
The proposed project has defined a clear path for their recruiting strategy and seems to have already established the necessary partnerships to achieve their diversity goals.

The PIs have gathered support from several faculty with research and education interests that align with information security to act as mentors for SFS students.

The organizational structure and project management plans are well defined and clearly laid out. Institutional support for internship and job placements services are identified.

Weaknesses:
Did not seem to find dedicated facilities/labs for use by SFS or IA students. The research labs described in the facilities section do not demonstrate how these labs are used for Information security related courses or research projects.

A concern exists also with the research interests of the CoPIs that are not directly relevant to cyber security research but may serve as mentors for SFS students.

Support letters mentioned in the proposal are not available for review.

What are the broader impacts of the proposed activity?

Strengths:
UG students will be required to complete a thesis. MS and PhD students will be disseminating their research in the cohorts, local seminars, as well as in peer reviewed venues. Research contributions will be formalized through completion of two credits per semester (6 hours per week) for undergraduates and masters students, and three to nine credit hours (9 to 15 hours per week) for Ph.D. students.

There is a specific and detailed plan for recruiting from HBCUs, Hispanic serving, Tribal colleges, and military personnel.

Summary Statement

A well thought-out effort with strong support from several IA faculty at the University from different colleges. The recruitment, retention, research engagement for students and placement plans are clearly defined. Some concerns remain with respect to the kinds of IA careers for which the program is geared towards and its alignment with Federal workforce requirements. Lack of dedicated infrastructure for hands-on training in various courses or IA research for SFS students is also a concern.

## Review #4

Rating: Good

Summary

What is the intellectual merit of the proposed activity?

The proposal aims to build a Cybersecurity program at the University of Arizona in the Department of Management Information Systems. The Department of Electrical and Computer Engineering will cover the security related material. UA is a designated CAE-IAE.

Dr. H. Chen, the PI, and Dr. H. Goes, one of the Co-PIs, are in the Department of MIS, while the other Co-PI , Dr. S. Hariri, is in the Department of ECE.
The research interests/publications of the first two investigators are in Information Science/Technology Management; for the ECE investigator they involve Supercomputing and High Performance Distributed Applications.

The investigators do not request any additional funding except for a small amount for a Lecturer, Dr. Patton, who will be managing the program.

The proposed MIS program will cover the basic CNSS material, with focus on Managing Information Systems and Business Communications. The BS program includes courses such as Managing IS, IS Analysis/Design, Information Security Risk Management, Information Security in Public/Private sectors.
The MS program has similar courses but additionally a course on Software Design.
The security related courses will be taught in the ECE Department.

What is missing from this program is Computer Security related material such as: Penetration Testing, Reverse Engineering, Cryptanalysis and more generally the security aspect of Cybersecurity.

Also, there is no provision for evaluation.

What are the broader impacts of the proposed activity?

The proposal aims at recruiting across the state of Arizona with focus on minorities to improve diversity.

The program has a multidisciplinary approach combining Management of IS, Business with security to broaden the scope of the program.

Summary Statement

The proposal aims to broaden the scope of the CyberCorps SFS program by extending it to include IS Management and Business for IT.
It will target a diverse student population in Arizona, and focus on underrepresented groups.

It is not clear whether the students who graduate from this program will have adequate analytical skills, or computer skills to deal with the current needs of government agencies to adress Cybersecurity threats.

## Review #5

Rating: Very Good

Summary

What is the intellectual merit of the proposed activity?

strengths:

Experienced and well-qualified PIs
Well-defined management plan
Solid interdisciplinary IA curriculum
Detailed recruitment plan which appears strong

What are the broader impacts of the proposed activity?

The program will increase the diversity and the number of qualified information assurance professionals.

Summary Statement

This is an excellent proposal. The institution has the program and infrastructure to deliver proposed activities and outcomes.