

## Grid Enablement of Scientific Applications on TeraGrid

S. Masoud Sadjadi  
School of Computing and  
Information Science  
Florida International  
University  
[sadjadi@cs.fiu.edu](mailto:sadjadi@cs.fiu.edu)

Sandie Kappes  
National Center for  
Supercomputing Applications  
University of Illinois at  
Urbana-Champaign  
[skappes@ncsa.uiuc.edu](mailto:skappes@ncsa.uiuc.edu)

Laura F. McGinnis  
Data & Information Resource  
Services  
Pittsburgh Supercomputing  
Center  
[lfm@psc.edu](mailto:lfm@psc.edu)

Florida International University's (FIU) School of Computing and Information Sciences (SCIS) is one of the leading producers of Bachelor's, Master's, and PhD degrees in Computing to Hispanics among those ranked as Research Universities by the Carnegie Foundation. Although Hispanics represent 12.1% of the United States' population, their representation in computing careers is at rates far below their proportionate representation in the US population. Among the many factors leading to Hispanic students' decision to switch to other disciplines or dropping out of school, our experience gained through years of working with the predominantly Hispanic-student population at our institution suggests that one of the key factors (also rated as one of the top factors by others) contributing to the high attrition rate in Computing majors at FIU is the *loss of interest* in Computing and the belief that a non-Computing field is more interesting.

To address this problem and to motivate our students, we brought new energy and excitement to our Computing curriculum by creating a new multi-disciplinary course that bridges the divide between Computing and non-Computing disciplines and brings graduate students of different disciplines together in a two-semester long program that teaches them how to solve complex scientific and engineering problems through inter-disciplinary collaboration and through the use of the recent advancements in Cyberinfrastructure (CI), including Cluster and Grid Computing. The National Science Foundation supported our idea and funded our Global CyberBridges (GCB, <http://cyberbridges.net/>, NSF OCI-0636031) project that promotes this new model for the future research workforce.

In the past three years of this project, GCB has been successful in creating a new generation of scientists and engineers who are capable of fully integrating CI into the whole educational, professional, and creative process of their diverse disciplines. GCB has successfully empowered our PhD students and their faculty advisors with CI, fostered inter-disciplinary research, improved the effectiveness of minority graduate education, and institutionalized this change process. During the course of the GCB project, we have been able to provide our Computing students with real and interesting domain applications for their Computing research (especially, High-Performance Computing research) and our non-Computing students with the knowledge and experience that helps them use CI to solve their problems. Our approach has resulted in an improved system for the effectiveness, penetration, and utilization of CI with an underrepresented sector of our society.

However, the lack of access to sufficient computational, storage, and networking resources in the past three years has proven to be the major hurdle in the rate of discovery for our GCB research projects. The TeraGrid Pathway Fellowship Program has helped us address this problem. In this presentation, we will show how this program has helped us enhance the syllabus and contents of the GCB course with the existing TeraGrid educational and training materials (e.g., the CI Tutor) so that the students taking the GCB course become able to utilize the TeraGrid resources to accelerate the rate of their findings and to be able to submit their research papers for publication within the two semesters of the GCB program.