



This is a 2 semester fellowship program. Ph.D. fellows will earn a CIARA Information Technology Science Certificate as well as travel support to participate in a national conference where they will present their work.

What is Global CyberBridges?

Global Cyber Bridges is a U.S. implementation of multinational effort to improve the technology training for a new generation of scientists, and to increase the rate of discovery for all domains. The project has committed participation from the Computer Network Information Center of the Chinese Academy of Sciences, the City University of Hong Kong, and the University of Sao Paulo's School of the Future in Brazil. The larger the number of graduate fellows collaboratively building their understanding in research and education Cyberinfrastructure (CI), the greater the number of CyberBridges centers, and the greater the opportunities are for cross discipline communication. Global CyberBridges Fellows in each location will enhance their understanding of High-Performance Networking and Grid Computing Augmented e-Science and Engineering Research and Education.

How Does a Science or Engineering Ph.D level Graduate Student Apply?

- Attend a one hour informational workshop. Visit www.cyberbridges.net for dates.
- Submit a one-page proposal describing your science or engineering research and how CI may enhance your work.
- Have the student proposal endorsed by a faculty advisor via a letter of support submitted with the proposal.
- Attach biographical information or CV (maximum of 2 pages).
- Email info@cyberbridges.net. Visit www.cyberbridges.net for proposal deadlines.
- Selection announcements will be posted on the web site. Visit www.cyberbridges.net for announcement dates.

Selection Criteria:

Selected fellowship applicants will conduct research and perform experiments alongside Cyberinfrastructure (CI) research scientists. This exploration will take place in a multidisciplinary distributed lab environment, with graduate students of various disciplines all exploring applications of CI research. We are looking for:

Candidates who are on a research path that can be augmented by grid computing
Must be a graduate student in Science or Engineering, preference given to Ph.D. track graduate students
Some programming background desired— C or C++ preferred, Java, or Fortran

Positions are limited. Selections will be based on applicant proposals, research background, and experience with grid computing.

Global CyberBridges Fellowship Requirements:

First Semester Independent Study: Special Topics in High-Performance Grid Computing and R&E Networking . Prerequisite for registration is admission into the Global CyberBridges program.

Second Semester Independent Study: Students and faculty will write a paper and a poster based on the research and experiment results, to be published and presented at an upcoming national/international conference.



First Semester Independent Study: Special Topics in High-Performance Grid Computing and Research Networking

Dr. S. Masoud Sadjadi, Assistant Professor, School of Computing and Information Sciences

R&E Networking

1. Introduction to Ethernet physical components

- a. Copper
- b. Fiber
- c. Switches
- d. Debugging Tools

2. Introduction to IP networking

- a. Address space
- b. Routing
- c. Debugging Tools

3. Review of issues in high performance computing

- a. Bandwidth Delay Product
- b. Frame size
- c. Latency/Jitter

4. Design of cluster networks

5. Implement cluster networks

Grid Computing

1. Cluster Computing

- a. Hardware & Software Concepts
- b. MPI

2. XML and Web Service

- a. XML and XML Schema
- b. SOAP
- c. WSDL and UDDI

3. Grid Computing

- a. Introduction
- b. Compute Grid & Data Grid
- c. Globus Toolkit
- d. OGSA

4. High-Performance Networking

- a. High-Speed TCP
- b. Performance Monitoring

Additional Topics

1. Virtual Teams

City University Hong Kong

2. SAGE: The Scalable Adaptive Graphics Environment/Tile Display Wall Concepts

UCSD-Calit2 with CNIC of CAS

Second Semester: Independent Study in Collaborative Research

Students will work on a collaborative project that will augment their individual research topics, resulting in a research paper with the help of the Global CyberBridges Co-PIs and their faculty advisors. The paper will be based on class research and experiment results, and will be published and presented at an upcoming conference.

Investigators:

- Heidi Alvarez, PI
- Peter Arzberger, Co-PI
- Julio Ibarra, Co-PI
- Kuldeep Kumar, Co-PI
- S. Masoud Sadjadi, Co-PI

International Collaborators:

- Computer Network Information Center of the Chinese Academy of Sciences
- University of Sao Paulo
- School of the Future, Brazil
- The City University of Hong Kong



LambdaVision 100-Megapixel display and SAGE (Scalable Adaptive Graphics Environment) software developed by the Electronic Visualization Laboratory at the University of Illinois at Chicago. Major funding provided by NSF.



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CI-TEAM Global CyberBridges
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Fellowship Opportunity for Science
and Computer Engineering Graduate Students



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