Board of Advisors

February 17, 2012
Education and Workforce Development
1\textsuperscript{st} cohort of 6 PhD students to graduate Summer/Fall 2011 through Spring 2012
  • CS (5); ES (1)

MS graduates (8)
  • CPS (2) Census Bureau, International Studies Abroad
  • CS (2) Microsoft, HP
  • GS (2) continued for PhD
  • ES (2) US Forest Service

UG graduates (9)
  • 8 continued on for MS either
  • ES (1) Gulf South Research Corp
Broadening Participation: Student Ethnicity

Cyber-ShARE

2007 2008 2009 2010

UTEP Comparison

CS+GS+ES

2010

Other

Black

Asian/Pac Islander

White

Temp Res

Hispanic

CS+GS+ES

Graduate Students

All US Higher Ed¹

2010

2008

Broadening Participation: Student Gender

Cyber-ShARE

UTEP Comparison CS+GS+ES

CS+GS+ES Graduate Students All US Higher Ed

11 Faculty & Professional Staff*

*7 from underrepresented groups

• Cross-disciplinary program with emphasis in applied mathematics, computing, science, and engineering
• Cyber-ShARE advisors directing and co-directing dissertations: Velazquez, Argaez, Velasco, Kreinovich

Growth in Computational Science Program since inception
Educational Pathways: Computational Science Program

- Program options:
  - PhD
  - Master’s
  - Professional Master
- Cyber-ShARE Center space for:
  - 2 post-docs
  - PhD students

Bureau of Labor Statistics projects an overall increase of 49% or 219,000 new computational science related jobs for 2004-2014.
• Characteristics of courses offered across Cyber-ShARE departments:
  • Involves students from multiple disciplines
  • Introduces projects that are cross-disciplinary
  • Prepares students to use, develop, and advance cyberinfrastructure
Educational Pathways: Professional Development

- **Distinguished Lecture Series**
- **Internships**
  - DataONE, NASA, PNNL, AFRL, LTER, USGS, NCAR, and others
- **Workshops**
  - **University wide workshops**
    - Technical workshops (average 25 attendees)
      Affinity Research Group sessions: development of student research and professional skills
  - **Regional workshops**
    - 2007 Summer Southwest Regional Cyberinfrastructure Workshop
    - 2010 Big Data for Science: Virtual School of Computational Science and Engineering (Blue Waters project—NCSA and IBM)
    - 2011 Virtual School Petascale programming; algorithms for multi-core processors
    - Annual UTEP-NMSU Joint Workshop on Mathematics, Computer Science, and Computational Sciences
Educational Pathways: Outreach Efforts

- COE Engineering Week
  - Reach over 100 attendees annually

- COE ExciTES Summer Institute
  - Reach over 350 students middle and high school students annually
  - 63% of 2010 participants showed increased interest in pursuing a college degree

- GK-12 program
  - Early-College high school program
  - Science for Sustainable Future

- Science Camp in N. Alaska
- NCWIT awardee
- HS Arctic ICE activity
- COE Nexus HS interns
- Middle school students
International Polar Year Research and Education Opportunities in Antarctica for Minorities
- 15 undergraduates
- 5 graduate students
- 5 high school teachers

UTEP’s Centennial Museum and El Paso’s Insights Museum display
- Over 5000 visitors
A new interdisciplinary work force – The need for a new workforce – a new flavor of mixed science and technology professional – is emerging. These individuals have expertise in a particular domain science area, as well as considerable expertise in computer science and mathematics. Also needed in this interdisciplinary mix are professionals who are trained to understand and address the human factors dimensions of working across disciplines, cultures, and institutions using technology-mediated collaborative tools.

- Atkins Report, 2003

- Students cross-trained in science, technology, and math
  - Computational science program
  - New courses and new content in existing courses
  - Training workshops
  - K-12 outreach efforts

- Students trained in working across disciplines, cultures and institutions
  - Integrated research and education => cross-disciplinary teamwork
  - Internships
Renewal Goal 2

- Broaden training and education of interdisciplinary, CI-knowledgeable citizens, including STEM students who receive advanced degrees and represent the 21st century demographics.
Logic Model

**ACTIVITIES**

- Define discovery-based applications that use CI for middle/high school students (visualizations, sensor networks, ontologies)
- Develop educational materials aligned with workforce needs in CI
- Add interdisciplinary courses to the University Catalog
- Leverage outreach efforts with existing programs
- Give workshops and presentations at UTEP, SACNAS, and other groups
- Present Vision Charettes locally and externally
- Work with organizations aligned with Cyber-ShARE
- Incorporate Affinity Research Group and interdisciplinary exemplary practices into research groups

**SHORT-TERM OUTCOMES**

- Increased interest in interdisciplinary projects
- Increased number of individuals with skills to work on interdisciplinary projects
- Increased number of students with interdisciplinary work experiences that require knowledge in CI
- Increased number of distinguished researcher with exposure to Cyber-ShARE
- Increased number of students successfully engaged in interdisciplinary research

**LONG-TERM OUTCOMES**

- Increased number of students from underrepresented groups who receive graduate degrees in STEM, in particular Hispanics and Native Americans
- Increased number of interdisciplinary and CI-savvy citizens