Building Diversity in the Undergraduate Computer Science Research Pipeline

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ABSTRACT

This paper describes our workshop for the ACM Southeast Conference to address methods for building diversity in computing, toward encouraging undergraduates to attend graduate school and to go on to faculty and research positions. This 1.5 hour workshop will highlight the basics on connecting to research, with particular lessons for students from underrepresented groups, through a series of brief presentations by the workshop leaders. The majority of the workshop will focus on highly-interactive breakout groups on specific topics, to include challenges and opportunities in building diversity, methods for encouraging undergraduate students toward research, metrics for measuring success in attracting undergraduate researchers, and steps toward ensuring a positive undergraduate research experience.

1. STATEMENT OF PURPOSE

This workshop will enlighten attendees as to the key issues in building diversity in computing research, leading to idea exchange among all workshop attendees. We expect that all in attendance will have opportunities to participate, both by asking questions of the workshop organizers and by offering their own insights and stories of relevance to the topic area. We also expect there to be important regional (southeast United States) connections made that will help with student exchange and research alliances, especially for research experience for undergraduates programs and broadening participation in computing alliances.

2. OBJECTIVES

The workshop will begin by informing attendees as to the key issues in research experiences, turning its focus to experiences of underrepresented minorities. The workshop will begin by encouraging an understanding of ways to approach hard problems with novel techniques, and ways for providing a "hands-on" understanding of the processes and products of research, through analysis of current domain areas and application platforms, system classification and description procedures, development and evaluation methodologies, and the like. Keys for constructing, advertising, and/or finding a quality research experience will be provided, highlighting the many ways to undertake research (e.g., individual mentorship, small groups) and the possible research products (e.g., publications, grad school admission).

Important to the research experience is funding and supporting diverse groups. Attendees will be pointed to the growing resource pool that can help with this endeavor, with a focus on efforts funded by the National Science Foundation's (NSF's) Broadening Participation in Computing (BPC) program and Research Experience for Undergrads (REU) program.

Information and discussion, to take place in four breakout groups, will be centered around the following topics of particular relevance:

Challenges and opportunities in building diversity in the Computer Science research pipeline. This discussion group will examine ways to recruit and retain students by developing interesting collaborative efforts. Challenges and success stories will be particularly welcome at this breakout group.

Encouraging undergrads at minority-serving institutions toward research. This group will focus on successful ways to advertise, recruit, and coordinate applications to undergraduate research programs. This group will seek to emphasize the role that a local mentor can and should play in encouraging undergraduate students in their research endeavors, when appropriate.

Attracting undergrad researchers to Ph.D. programs: metrics for success. This group will examine conditions of a student's research experience that are likely to lead to grad school enrollment, and how faculty members and other supporters can motivate students to a research career. Students in attendance will learn the "right questions to ask" about a potential research program.

Steps toward ensuring a positive undergrad research experience. This group will discuss the activities that are important to include (or look for) in a research experience. Participants will consider how context of the participants (e.g., cultural/ethnic backgrounds, academic backgrounds) and the sometimes competing desires to work hard and to have fun can be balanced in to create a fun and productive research environment.

3. PREREQUISITES

There are no explicit prerequisites for attending this workshop, other than an interest in the topic area. This workshop is the second in a series of workshops on this topic, the first taking place at the Richard Tapia Celebration of Diversity in Computing Conference in October 2007, but prior attendance at that workshop is not necessary.

4. INTENDED AUDIENCE
This workshop is targeted to three distinct and important groups:

Administrators interested in initiating diversity-focused research programs at their home universities, or those willing to share their experiences with others and to learn about other elements to include in their program.

Faculty members who want to recruit students to do research with them, or who want to encourage their students to pursue research experiences at other universities.

Students who may be considering a career in research and are interested in the opportunities available to them.

5. DURATION
This workshop will be 1.5 hours, with approximately 20 minutes dedicated to introductions and informational presentations, and one hour dedicated to the breakout group discussions outlined in this document. The remaining time will be used for brief group presentations to summarize the lessons from the breakout groups.

6. MATERIALS AND RESOURCES
A projector will be needed for the presentation portion of the workshop, with tables suitable for breakout groups needed for the next portion.

Handout materials will be prepared for distribution at the workshop, including the slides used by all presenters. This and related materials will be posted on the web at http://www.hbcuresearchalliance.ncat.edu