

REUs: UNDERGRADUATE RESEARCH EXPERIENCES AND FUNDING*

PANEL DISCUSSION

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SUMMARY

Researchers are sometimes daunted by the specter of bringing undergraduate students into their labs without compromising their research agenda, but still providing a meaningful educational experience for students. This panel brings together experienced undergraduate research mentors to discuss and explore the challenges, strategies, and benefits of robust research programs for undergraduates.

Categories and Subject Descriptors

K.3.2 [**Computers and Education**]: Computer Science Education

General Terms

Management

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INTRODUCTION

Many educators have reported on benefits and experiences of engaging undergraduate students in research [1, 2]. Others have reported on the mechanics of incorporating undergraduate research in the curriculum, on the mechanics at liberal arts colleges, on its impact in increasing student retention in computer science, and on their successes and failures [3-6]. This panel will provide information about existing sites, and approaches and resources that have been used around the country. We will also talk about why these experiences enhance an educational program or internship. We will explore the different types of programs (NSF Sites, CRA-W DMP, CDC DMP, NSF REU Supplements, NASA, and corporate research labs). Also, we will talk about the trade-offs between summer and academic year programs, and show profiles of example programs.

Sample student projects will be given with best practices on designing research projects. Student training in the broadest sense will be discussed, including team work, ethics, problem solving, design and dissemination of research. Practical advice on the time that it takes to run an REU site, who should run it (i.e., should you do this pre-tenure?), how to get institutional commitment (dollars, staff and credit), evaluation and assessment, the advantages of REU "cohorts" and how to combine REU supplements into an REU "site". We will emphasize the benefits to faculty and their institutions for hosting REUs: develop research culture, enhance graduate school recruiting, strengthen educational mission, and broaden impact of research.

FORMAT AND PARTICIPANTS

The panel will spend 50 minutes presenting information and then will allow 25 minutes for interaction with the audience. Furthermore, undergraduate students who have participated in REU programs in the past will be present in the audience to answer questions. Each panelist's topic of discussion is summarized in the next four subsections.

1. Joan Peckham: Moderator

Joan Peckham is a Professor of Computer Science at the University of Rhode Island. Her areas of interest and expertise include software modeling, databases, bioinformatics, intelligent transportation systems, and institutional transformation to support diversity. She is the PI on an NSF REU site for Computer Graphics and Graphical Design that includes Art and Computer Science students to work on interdisciplinary research projects. The site has just completed its fourth year. Professor Peckham will talk about the international and ethics components that are included at her site. She will also discuss strategies for hosting undergraduate research with students from your own institution without external funding.

Since interdisciplinary projects are central to her site, she will provide ideas for reaching out within an institution to partner with other disciplines for projects that can assist in the recruitment and retention of students in computing.

2. Fatma Mili

Fatma Mili is a Professor of Computer Science at Oakland University. She has been the PI and co-PI on two NSF-funded REU programs and a BBSI (Bioengineering and Bioinformatics Summer Institute) funded by NSF and NIH. The recruitment focus of these programs has been on broadening participation by targeting women in the REUs and minority students in the BBSI. Her presentation will address different aspects related to this focus and discuss costs and benefits to the faculty in mentoring undergraduate students. With respect to broadening participation, she will discuss practical and legal challenges in advertising and targeting recruitment to specific under-represented groups and share resources and strategies that were found to be helpful in reaching and attracting such students. With respect to the value of mentoring undergraduate students, she will show examples of research projects and publications that would not have come about in more traditional graduate research settings. Furthermore, she will argue that for an increasingly large number of US educational institutions, the best way to attract graduate students is to grow them in-house, and assert that these REU programs provide an important instrument for that.

3. Daniela Stan Raicu

Daniela Stan Raicu is an Assistant Professor of the School of Computer Science, Telecommunications, and Information Systems (CTI) at DePaul University. She is the PI of the NSF REU Medical Informatics (MedIX) site, an interdisciplinary program in Computer Science and Medicine hosted by DePaul University and Northwestern University. Professor Raicu will present several approaches adopted by the MedIX program in mentoring undergraduate students leading to research publications and presentations, open source software, honor theses, national awards for outstanding research, and acceptance in graduate school. She will also discuss her experiences in getting institutional and corporate support for undergraduate research and establishing undergraduate research as a standard-based learning approach. Professor Raicu will provide examples of interdisciplinary projects and avenues for undergraduate publications. Furthermore, she will also present educational tools used for evaluation and assessment of the MedIX program.

4. Ingrid Russell

Ingrid Russell is a Professor of Computer Science at the University of Hartford. She has directed several undergraduate student research projects over the past 15 years. Funding for these efforts has been secured through three main sources: National Science Foundation REU supplements to existing grants, corporate research and development sponsorships, and NASA undergraduate research funding. NASA funding was provided

through the NASA Connecticut Space Grant Consortium. Similar state programs are available in other states. Through its Engineering Applications Center, the University of Hartford also develops partnerships with local industries through collaborative research programs and student projects. She will present the opportunities she has provided for undergraduates through research projects funded by these three sources of funding as well as the challenges associated with each source of funding. Pointers for securing such funding along with types of activities funded by these programs will be presented. How the three sources of funding differ in terms of procedures, requirements, and expectations will also be addressed. Sample student projects funded by each of the three programs will also be presented.

CONCLUSION

The four panelists have been chosen to represent the various levels of professorships, from tenure-track to tenured professors. Each one of them has a unique perspective on undergraduate research and what it takes to run a successful REU program. The panel will strive to achieve better awareness and emphasize the significance of undergraduate research within one's research agenda. REU programs are essential in the fostering of the rich talent that far too often chooses not to pursue advanced graduate degrees.

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