Panel 3

Writing A Highly Competitive Renewal And New NSF Funding Opportunities

CISE REU PI Meeting 2023, Austin, Texas – April 2023

Friday, April 21, 2023
10:30-11:30 AM in Primrose AB
Description of the panel

This session will focus on the essential elements of a competitive REU site renewal proposal, from reporting on past REU site recruitment, activities, research, to publications. Then PIs on this panel who have developed successful renewal proposals will discuss their approaches to writing a renewal proposal. The panelists will also talk about elements that set the best renewals apart from others from the perspective of a reviewer. The session will describe relevant NSF funding opportunities.
Panelists

Moderator:
Jeffrey Forbes
National Science Foundation

Mubarak Shah
University of Central Florida

Juana Moreno
Louisiana State University

Yu Liu
Clarkson University

Tingting Chen
California State Polytechnic University Pomona
Jeff Forbes

Directorate for Computer & Information Science & Engineering
National Science Foundation
Review the solicitation!

- Don’t just edit a past proposal
- Check the updated solicitation for stipends, budget, and other advice
- Follow the Proposal Preparation Instructions or risk return without review

- Follow the CISE-specific guidance
  - Use ETAP to manage student applications and collecting student demographic information
  - Student travel and evaluation don’t need to be in budget
Results from Prior Support

● Describe the earlier REU project(s) and outcomes in sufficient detail to permit reviewers to reach an informed conclusion regarding the value of the results achieved (up to 5 pages!)
  ○ Results from project evaluation
  ○ Data from past site in tables
    ■ Information about recruiting efforts and the number and characteristics of applicants
    ■ Demographic makeup of participants and their home institutions
    ■ Career choices of participants
    ■ List of presentations and publications

● Make sure your final annual report is comprehensive and compelling
Evolve your site

- How have you changed your site in response to lessons learned and evaluation?
- New aspects of your intellectual focus?
- What are the research and student goals for the new site?
  - Balance between research and professional development
  - Preparation for research and continued engagement
Funding Opportunities

- **For your students:**
  - Graduate Research Fellowship Program
  - CISE Graduate Fellowships (CSGrad4US)
  - CRA's National Virtual Computing Research Mentor Program (UR2PhD)

- **Funding undergraduate research:**
  - Add undergraduate research to any project
  - [REU Supplements](#) for CISE research projects - embedded or for existing awards
  - [Computing in Undergraduate Education](#) Transformation track
  - [CISE Minority-Serving Institutions Research Expansion Program](#) (CISE-MSI)
Mubarak Shah

Research Experience for Undergraduates in Computer Vision

University of Central Florida
Key Elements of UCF REU

- Full Summer Experience
- Immerse the participants in full research environment.
- Present several possible projects to work on
- Offer optional follow-on through the year
- Expose benefits of graduate school
- Field Trips to local companies
- Social Events
Program Outline

- Recruiting
- Short course
  - Python/Keras
- Research projects selection
- Work on Research Projects
- Graduate School Workshops
- Write technical report/research paper
- Poster Session
Student Activities

• Meetings
  • Individual meetings with graduate student mentors/Faculty Mentors
  • Weekly Reporting meetings
  • Vision group meetings
• Ph.D. Candidacy/Defense presentations
• Colloquia by known researchers
• Field Trips
• Social Luncheons/Dinners
• Banquet
Our REU Grants (87-91)

- 1987: Mubarak Shah
- 1988: Missed the announcement
- 1989: Mubarak Shah, Kevin Bowyer, and G. Krishnan
- 1990: Mubarak Shah, Kevin Bowyer, and G. Krishnan
- 1991: Mubarak Shah, Kevin Bowyer, and G. Krishnan
Our REU Grants (92-97)

- 1992: Mubarak Shah and Kevin Bowyer (Funded for two years)
- 1993
- 1994: Did not get funded
- 1995 Mubarak Shah, Kevin Bowyer, Louise Stark and Niels Lobo (Funded for three years)
- 1996
- 1997
Our REU Grants (98-2005)

- 1998: Mubarak Shah, Niels Lobo, Art Weeks (funded for three years)
- 1999
- 2000
- 2001: Mubarak Shah, Niels Lobo, and Takis Kasparis (funded for five years)
- 2002
- 2003
- 2004
- 2005
Our REU Grants (2006-211)

- 2006 Mubarak Shah, Niels Lobo, and Takis Kasparis (funded for three years)
- 2007
- 2008
- 2009 Mubarak Shah, Niels Lobo, and Marshall Tappen (funded for three years)
- 2010
- 2011
Our REU Grants (2012-2018)

- 2012 Mubarak Shah, Niels Lobo, and Rahul Sukthankar (funded for three years)
- 2013
- 2014
- 2015 Mubarak Shah, Niels Lobo, and Rahul Suthankar (funded for three years)
- 2016
- 2017
- 2018 Mubarak Shah, Niels Lobo, and Ali Borji (funded for three years)
Our REU Grants (2019-2020)

- 2019
- 2020
Juana Moreno

Interdisciplinary Research Experience in Computational Sciences

Louisiana State University
Juana Moreno

Dept. of Physics and Astronomy & Center for Computation and Technology, Louisiana State University
Research Interests: Computational materials science, computing education
Email: moreno@lsu.edu

REU Site: [http://reu.cct.lsu.edu](http://reu.cct.lsu.edu)
To success: care for the students & recruit caring mentors.
Renewal proposal

- Follow the call for proposal suggested sections:
  - Overview: 1 page
  - Nature of Students Activities
    - General comments & cohort experience: 2 pages
    - Research projects (10-12) including mentor experience and student specific role: 5 pages
  - Research Environment: include facilities available to students (½-1 page)
  - Recruitment & Selection (1 page)
  - Student & Mentor Professional Development (½ page)
  - Evaluation (1 page)
  - Results from Prior Site (4 pages)
    - List of prior students
    - List of published papers
    - Where they are: # still in College, # Graduate school, # company
    - Fellowships/Scholarship received (NSF Graduate Research, Goldwater, Louis-Stokes, etc)
    - Recruitment summary
    - Evaluation summary
Yu Liu

High Performance Computing with Engineering Applications

Clarkson University
Yu Liu

Assistant Professor of Department of Electrical and Computer Engineering, Clarkson University
Research Interests: Computer Architectures, High Performance Computing, Real-Time Systems
Email: yuliu@clarkson.edu
REU Site Website: http://reu-hpc.clarkson.edu/
Basic Info & Achievements

- **REU Site: HPC with Engineering Applications (Yu Liu & Daqing Hou)**
- **NSF Grant #1852102 (2019-2022), the renewal #2244049 (2023-2025)**
- **REU students have published 10 peer-reviewed papers, and PIs have published 2 papers in ASEE regarding this site [1,2].**

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<td>M. Veresko (Clarkson) S. Monroe (Clarkson) M. Koscaek (Clarkson) K. Addo (RIT, planned)</td>
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Note that our 2022 REU students contributed 4 more publications after renewal proposal submission.
Summary of Good Practices

Our conceptual framework that connects best practices to the desirable outcomes of REU Site.

Please refer to our 2020 & 2022 ASEE papers for more sharing [1,2].

A Successful Story - Martin Veresko (2021 REU Alumnus)

- “During the summer of my junior year, I participated in the High-Performance Computing (HPC) REU working with Professor Cheng on implementing reduced order models for quantum dots. The opportunity allowed me to develop my passion for research. Beforehand, the thought of pursuing research had never occurred to me. However, I was hooked from the start. I loved the problem-solving nature and the generated excitement upon finding answers to unknown questions. Additionally, during this time I developed new mathematical and computational skills allowing me to tackle more problems in the future. Due to the enthusiasm and support from my advisor Professor Cheng and the directors of the REU program, Professor Liu and Hou, the HPC REU is a great place to curate one’s passion for research. Due to my positive experience during the REU I decided to enter graduate school allowing me to continue what I love. “ - Martin Versko

- Martin has published 4 peer-reviewed papers, including one journal paper on “Scientific Reports”, published by Nature [3].

Tingting Chen

REU Site in Big Data Security and Privacy

California State Polytechnic University-Pomona
Tingting Chen

Professor of Computer Science, Cal Poly Pomona
Research interests: data privacy, health informatics, data-driven applications in medical systems.
tingtingchen@cpp.edu
REU Site in Big Data Security and Privacy at Cal Poly Pomona

- NSF grants #CNS-1758017 (2018-2021), the renewal #CNS-2050826 (2021-2024) and S-STEM Supplement of $30,000 in 2021.
- To date, the REU site has funded 46 undergraduate students in total. 24 are from minority or underrepresented groups and 31 are from institutions without Ph.D programs.
- Post program support: 2 Goldwater scholarship recipients and 1 NSF Graduate Research Fellowship Award recipient.
What We Have Learned

● Student Engagement and Mentoring
  ○ Structure and flexibility
  ○ Presentations and professional conference experience
  ○ Student cohort building activities help improve students’ experience and research outcomes

● Building a successful REU site needs joint effort from the university, i.e., College of Science, Office of Undergraduate Research, the Office of Research and Sponsored Programs, University Housing, and the Information Technology Support Team, etc.
How can PIs effectively demonstrate the *impact and outcomes* of their previous REU site activities and research in a renewal proposal?
How can PIs ensure that their renewal proposals align with the priorities and goals of the NSF, and what are some best practices for incorporating these priorities into the proposal?
PIs’ Q&A with panelists