Panel 4: Broadening Participation in Computing

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

Friday, April 21, 2023
1:30-2:30 PM in Primrose AB
The NSF CISE community recognizes the importance of broadening participation in computing. This panel will focus on the role of undergraduate research for promoting diversity, equity and inclusion and specific strategies to enable and structure such experiences meaningfully, and its role in growing an inclusive research workforce in computing and information sciences long-term. Panelists will share insights and tested practices. They will also respond to questions from the audience.

Moderator: Cecilia Alm, REU PI at RIT
Panelists

Reynold Bailey
RIT

Raja Kushalnagar
Gallaudet U.

Joshua Sunshine
CMU

Jamie Payton
Temple U.
Reynold Bailey

rjbvcs@rit.edu

REU Site: Computational Sensing for Human-centered AI

https://cs.rit.edu/~reu/

Rochester Institute of Technology
Reynold (Rennie) Bailey

- Associate Undergraduate Program Coordinator for CS @ RIT
- Served as a research mentor on three REU Sites and various REU supplement awards
- Co-PI for two REU Sites
Set high targets for broadening participation

<table>
<thead>
<tr>
<th></th>
<th>Average 3-yr target</th>
<th>2019</th>
<th>2021</th>
<th>2022</th>
<th>Average 3-yr actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Women and gender minorities</td>
<td>50%</td>
<td>50%</td>
<td>70%</td>
<td>70%</td>
<td>63%</td>
</tr>
<tr>
<td>% Underrepresented minorities</td>
<td>40%</td>
<td>30%</td>
<td>60%</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>% Outside RIT</td>
<td>80%</td>
<td>100%</td>
<td>90%</td>
<td>100%</td>
<td>97%</td>
</tr>
<tr>
<td>% Computing majors</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>% Limited CS research opportunities</td>
<td>60%</td>
<td>70%</td>
<td>50%</td>
<td>50%</td>
<td>57%</td>
</tr>
<tr>
<td>% Earlier than college junior</td>
<td>30%</td>
<td>40%</td>
<td>30%</td>
<td>30%</td>
<td>33%</td>
</tr>
<tr>
<td>% With disability</td>
<td>23%</td>
<td>10%</td>
<td>30%</td>
<td>30%</td>
<td>23%</td>
</tr>
</tbody>
</table>

Cohort demographics for REU Site: Computational Sensing for Human-centered AI. Green and bold indicate that the Site met or exceeded our own set average 3-year target.
Consider unconventional dimensions of diversity

- Veterans
- First-generation college students
- CODA (children of Deaf adults)
- Students with prior study-abroad experience
- Geographic
- ....

Geographic distribution of applicants’ and cohort participants’ home institutions for prior REU Site. Blue indicates applicants. Red indicates cohort participants.
Be thoughtful about diversity at different levels, for example…

- Are all your faculty mentors white males?
- Are all your faculty mentors full professors?
- Are your REU teams comprised of students…
  - from similar institutions?
  - from the same college level?
  - with same gender/race/ethnic identity?
- Are your social and professional activities planned without considering the needs of differently-abled individuals?
- Are you enabling a variety of near-peer mentoring interactions with…
  - other undergraduate students?
  - MS students?
  - early and late stage PhD students?
  - newly-minted PhDs?
  - junior faculty?
Raja Kushalnagar

raja.kushalnagar@gallaudet.edu

REU Site: Accessible Information and Communication Technologies

https://aict.gallaudet.edu

Gallaudet University
Raja Kushalnagar

- Undergraduate Director for the IT Program
- Graduate Co-Director for Accessible HCC Program
- REU PI on 3 REU Sites related to Accessible Computing
- Co-Director on Distributed REU program

- 66 students between 2015 and 2021
  - 57% identified as deaf or hard of hearing
  - 44% identified as women
  - 33% identified as members of underrepresented minority groups
  - 51% came from institutions with limited research opportunities
Accessible Computing – building capacity

● Review essays
  ○ Do they have experience or passion for accessibility?
    ■ If yes, can motivate them to go to graduate school or industry
  ○ Would they be allies for this field?
    ■ If yes, can become lifetime allies for people with disabilities
  ○ Will they work well in teams?
  ○ View transcripts holistically for program success

● Broadening pool
  ○ Encourage social science majors with technology backgrounds to apply
  ○ Create multi-disciplinary projects with scope for two or three students
Joshua Sunshine

sunshine@cs.cmu.edu

CMU REU Site in Software Engineering (REUSE)

https://reuse.cs.cmu.edu/

Carnegie Mellon University
Joshua Sunshine

- Assistant Professor at Carnegie Mellon
- Director of REUSE since 2016
- PI of three consecutive REU site awards for REUSE
- Co-directors: Charlie Garrod and Claire Le Goues
- Site administrator: Sam Mudrinich
2023 REUSE cohort demographics

- **52** students
- **37** projects
- **41** colleges
- **0** from CMU

- **14** male
- **33** female
- **4** non-binary

- **13** Asian
- **6** Black
- **9** Hispanic
- **1** Multi-Race
- **14** White
- **9** Unknown
Rethink admissions

Don't rank applicants
- Train admissions committee
- Assemble a diverse cohort from applicants that meet preset criteria

Reset mentor expectations
- Craft accessible projects
- Goal is learning not research productivity

Do you think the REUSE program will be a *positive, transformational experience* for this student?
Jamie Payton

payton@temple.edu

Research Experiences in Pervasive Computing for Smart Health, Safety, and Well-being

cis.temple.edu/reu

Temple University
Jamie Payton [she/her]

- Professor and Chairperson @ Temple Univ
- Director of the STARS Computing Corps
  BPC Alliance
- PI of 4 consecutively funded REU Sites
Recruiting and designing for BPC

Leverage relationships with BPC Alliances, INCLUDES Alliances, and other BPC organizations
Consider intersectional identities

<table>
<thead>
<tr>
<th>SELECTED PARTICIPANTS</th>
<th>2018</th>
<th></th>
<th>2019</th>
<th></th>
<th>2021</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
<td>N/A</td>
<td>Total</td>
<td>%</td>
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<td>Asian</td>
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<td>Black/African American</td>
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<td>3</td>
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<td>1</td>
<td>11%</td>
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</table>

Total                          | 3    | 6        | 0    | 9        | 33%  | 6        | 9    | 2    | 11   | 67%  | 9    | 2   | 0    | 11   | 100% |

%                                  | 33%  | 67%       | 0%  | 0%       | 100% | 82%  | 18%  | 0%  | 0%  | 100% | 44%  | 44%  | 0%  | 11%  | 100% |
Creating inclusive experiences for REU Site students

- Provide mentors and REU students with norms, expectations, and resources for creating an inclusive research experience
- Build on evidence-based best practices

Affinity Research Group model

- Interdependence
- Promotive interaction
- Individual accountability
- Group + professional skills
- Group processing
Please tell us about strategies applied at or findings from your REU Site that are contributing to broadening participation in computing.
What challenges has your REU site faced in its work on broadening participation, and how has your team overcome, or is working to overcome, them?
PIs’ Q&A with panelists
Thank you!