

# CISE REU Evaluation Toolkit

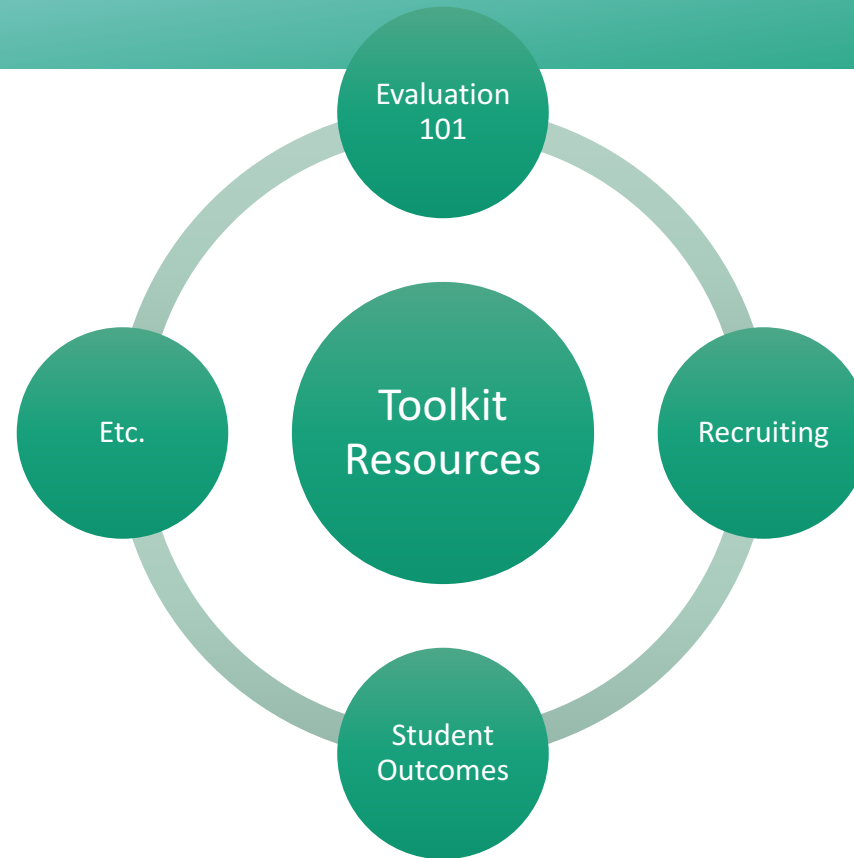
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College of Computing & Informatics

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# Evaluation & Assessment Considerations



# Intentional Evaluation



- What is the vision?
  - Project goals
  - Student impact
  - Resources & support
  - Milestones
- What evidence is needed?

# Eval 101: REU Program Outcomes

- Applicants
  - Applied vs Accept
  - Demographics
  - Limited research access
- Program Outcomes
  - Publications
  - Dissemination
  - Products
- Participants
  - Attitudes, Behaviors, Cognition (skills, knowledge)
  - Experiences, Activities
  - Longitudinal outcomes
- Specialty
  - Mentoring?
  - Graduate student development?
  - Other Contributions

# Recruiting Resources: Common Application

- 56 items covering contact information, academic preparation, graduate school plans, demographic information
- **Customizable** (theme, items, next steps information)
  - Immediate access to your applicants
  - Manages student data in a form
- No tool for references, resumes, or transcripts

What PI  
Sees



	A	B	C	D	E	F	G	H
1	Timestamp	Would you like to opt out of participation in the research study?	First Name	Middle Name	Last Name	Permanent Email Address	Preferred Contact Email Address	Current Street Address

# Recruiting Resources: Common Application

## What Applicant Sees

Research Experience for Undergraduates: Socially Relevant Computing  
College of Computing and Informatics

Home Overview Research Areas **Application**

### Application

Application period is now open!

**DATES: May 30 - July 28, 2017**

**DEADLINE: February 22, 2017**

**Required Material**

- [Application Form](#)
- Personal Statement - (Please **include your name** on your personal statement)
- Unofficial Transcript - (Please **include your name** on your unofficial transcript)
- [Two Recommendations](#)

Note: Two letters of recommendations are required. The program requires recommendations from a faculty member in your major, minor, or course of study.

**How to Apply**

- Click **Application Form** above, complete the online form, and submit.
- Email your personal statement and a copy of your unofficial transcript to [aubrae.collins@uncc.edu](mailto:aubrae.collins@uncc.edu). **Be sure both include your name.**
- Direct two faculty members to the Recommendation link and request that they send the completed form to [aubrae.collins@uncc.edu](mailto:aubrae.collins@uncc.edu).

## CISE REU Common Application: UNC Charlotte's Socially Relevant Computing REU

Research Experiences for Undergraduates (REU) programs support active research participation by undergraduate students in Computing, Information Science, and Engineering (CISE) areas of research that are funded by the National Science Foundation. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program. This program provides educational opportunities for Undergraduate Students. This program provides indirect funding for undergraduate students to participate in research. The application form is a common application form used by universities with National Science Foundation sponsored REU programs. Our University's program supports this activity.

### Application Process:

- STEP 1: As an applicant, you will be asked to complete the following application in consideration of your candidacy for the REU program.
- STEP 2: Upon completion of this application, you will be directed back to the REU Site web page.
- STEP 3: At the REU Site web page, you will be able to submit any additional materials that are requested as part of the institutional application.
- STEP 4: Notification of acceptance information is included on the REU Site web page.

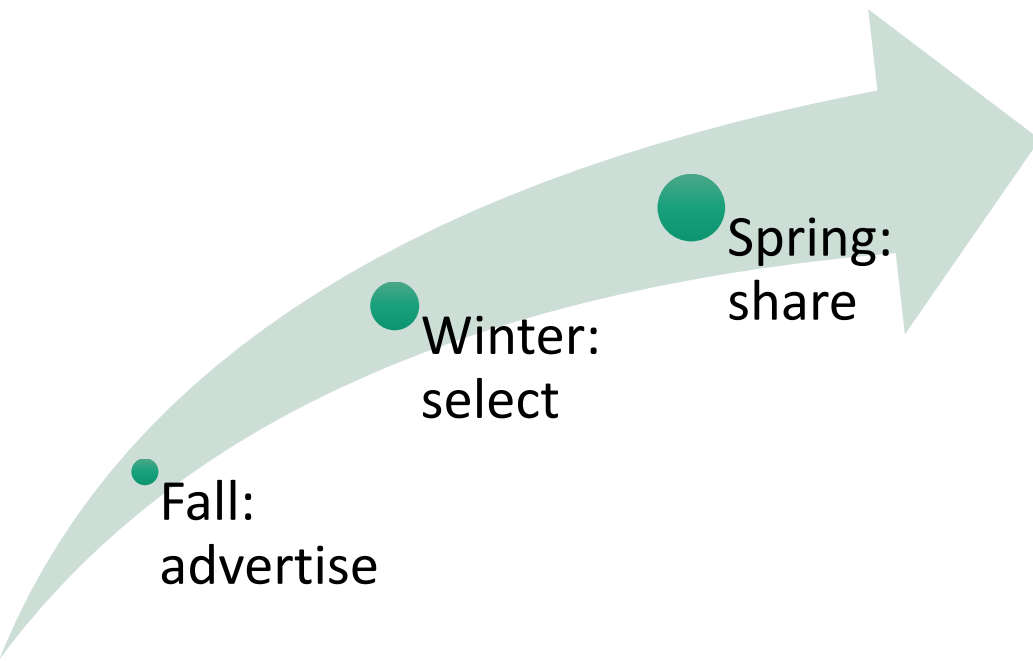
### Eligibility:

Applicants must be a U.S. citizen or permanent resident of the United States; be and remain an undergraduate student in good standing; plan to complete an undergraduate degree program.

### Confidentiality:

Your application information will be reviewed by the Faculty member(s) managing the REU Site to which you apply in consideration of your candidacy. An additional Evaluator will compile aggregate application information anonymously for general reporting purposes to the National Science Foundation. and may be used in future publications to describe REU applicant pool demographic

# Recruiting Resources: Applicant Sharing



## *1. Advertise on GoogleDoc*

Students are directed to you

## *2. Shared Applicant Pool*

You contact students from other sites

# Results: Common Application Trends

Site Descriptors	2010 (N=13)	2011 (N=20)	2012 (N=22)	2013 (N= 26)	2014 (N=25)	2015 (N= 23)	2016 (N= 27)
Range of # Applicants	29-152	4-176	18-212	20-299	29-232	15- 349	27- 286
Avg Applications per Site	77	79	93	112	102	122	108
Largest # of Sites Applied to by Individual	30 (n=1)	6 (n=1)	7 (n=2)	18 (n=1)	14 (n=1)	16 (n=1)	9 (n=3)
% of Female Applicants	27%	26%	24%	28%	27%	26%	32%
% of URM Applicants	28%	34%	36%	31%	31%	35%	33%



# Student Outcomes: A la Carte Student Survey

Pre and Post-Test

Post-Test Only

Self-  
Efficacy

Research  
Skills

Help-  
Seeking

Mentoring

Graduate  
School  
Intent

Leadership

Grit

Program  
Satisfaction

Attitudes

Professional  
Identity

# Student Outcomes: How Survey Works

The screenshot shows the CISE REU Toolkit website. The header includes the UNC Charlotte logo and the text 'Research Experience for Undergraduates: Socially Relevant Computing' and 'College of Computing and Informatics'. A search bar is present in the top right. The navigation menu includes 'Home', 'Overview', 'Research Areas', 'Application', 'Project Archive', and 'CISE REU Toolkit'. The main content area is titled 'A La Carte Student Survey' and contains a paragraph explaining the survey's purpose and a list of indicators. A table at the bottom is titled 'Cross-Walk of A La Carte Themes to Recommended Indicators' and has two columns: 'A LA CARTE SURVEY THEMES' and 'RECOMMENDED INDICATORS CATEGORIES'.

UNC CHARLOTTE  
Research Experience for Undergraduates: Socially Relevant Computing  
College of Computing and Informatics

Home Contact Us  
Keyword / Search

Home Overview Research Areas Application Project Archive CISE REU Toolkit

**CISE REU Toolkit**

- About Us
- FAQ
- Evaluation Overview
- IRB Approval
- Common Application
- Shared Applicant Pool
- A La Carte Student Survey**
  - Using the Survey
  - Survey Development
  - Preview the La Carte Student Survey
- Faculty/PI Survey
- Project Goals
- How to Assess your Program
- Analysis
- Reporting
- Results from CISE REU Toolkit

**A La Carte Student Survey**

A charge from the CISE REU PI community is to work toward a systematic means of collecting and reporting on evaluation data on CISE REU programs, so that the complete and comparable REU story can be told. To this end, we continue to develop survey scales that correspond to the Recommended Indicators (see below). These scales have been designed to measure the Recommended Indicators, which have been found to be common among CISE REU programs. REU PIs are able to select the scales and items as deemed appropriate for your site from the A La Carte Survey menu, with guidelines and instructions provided. The scales measure the following indicators:

- self-efficacy
- intentions to attend graduate school
- computer science attitudes
- help-seeking and coping behaviors
- grit
- research skills
- mentoring satisfaction
- leadership
- professional/scientist identity formation
- satisfaction with REU experience

**Cross-Walk of A La Carte Themes to Recommended Indicators**

A LA CARTE SURVEY THEMES	RECOMMENDED INDICATORS CATEGORIES
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## Deployment Options

### Toolkit Administered

- + Data collection and analysis done for you
- + Data package = your site data (raw and coded), code book, results
- + Anonymized data

### PI Administered

- Site collects and analyzes
- Identified

# Student Outcomes: Data Package

- Raw and Coded data of pre and post responses
- Matched Pairs data
- Code Book
- Analysis of pre/post data
- Data is de-identified



# Results: A la Carte 2016

*Significant Effects for Time (pre- and post- surveys, \*(p<.05)*

<b>Construct</b>	<b>Pre (SD) N= 305</b>	<b>Post (SD) N= 268</b>
<b>Self-Efficacy*</b>	3.67 (.61)	4.21 (.53)
<b>Intent to Grad School*</b>	3.83 (.75)	3.7 (.88)
<b>Attitudes*</b>	4.33 (.51)	4.09 (.74)
Help-Seeking/ Coping	4.27 (.61)	4.35 (.64)
<b>Research Knowledge*</b>	3.15 (.66)	3.92 (.59)
Grit	3.36 (.35)	3.39 (.40)
<b>Scientific Identity*</b>	3.42 (.91)	3.68 (1.0)
<b>Leadership*</b>	4.18 (.60)	4.30 (.65)
Mentorship	Not applicable	4.38 (.84)

Descriptives:

- 43% Female
- 35% multi-ethnic minority groups
- Predominantly Rising Juniors and Seniors

Note: 5 pt Likert scale

# Etc.: Additional Considerations

IRB

Longitudinal  
Tracking

Outcomes  
of Interest

Campus  
Resources

## Online Evaluation Toolkit

- Evaluation Toolkit: [reu.uncc.edu/cise-reu-toolkit](http://reu.uncc.edu/cise-reu-toolkit)
- How To videos
- Evaluation materials and resources tailored to CISE REU

## Common Application

- Google Form application UNIQUE to site
- Standardized & customizable
- Aggregate descriptive statistics across CISE directorate

## Shared Applicant Pool

- Managed via Google Drive & Common Applications
- Site PI “releases” unselected candidates
- All PIs have access to online folder

## Surveys: A la Carte and Faculty

- Student Outcomes: modulated, valid/reliable
- Faculty Impact: Survey deploying summer 2016

## Alumni Tracking

- Under construction
- Join the working group

[reu.uncc.edu/cise-reu-toolkit](http://reu.uncc.edu/cise-reu-toolkit)

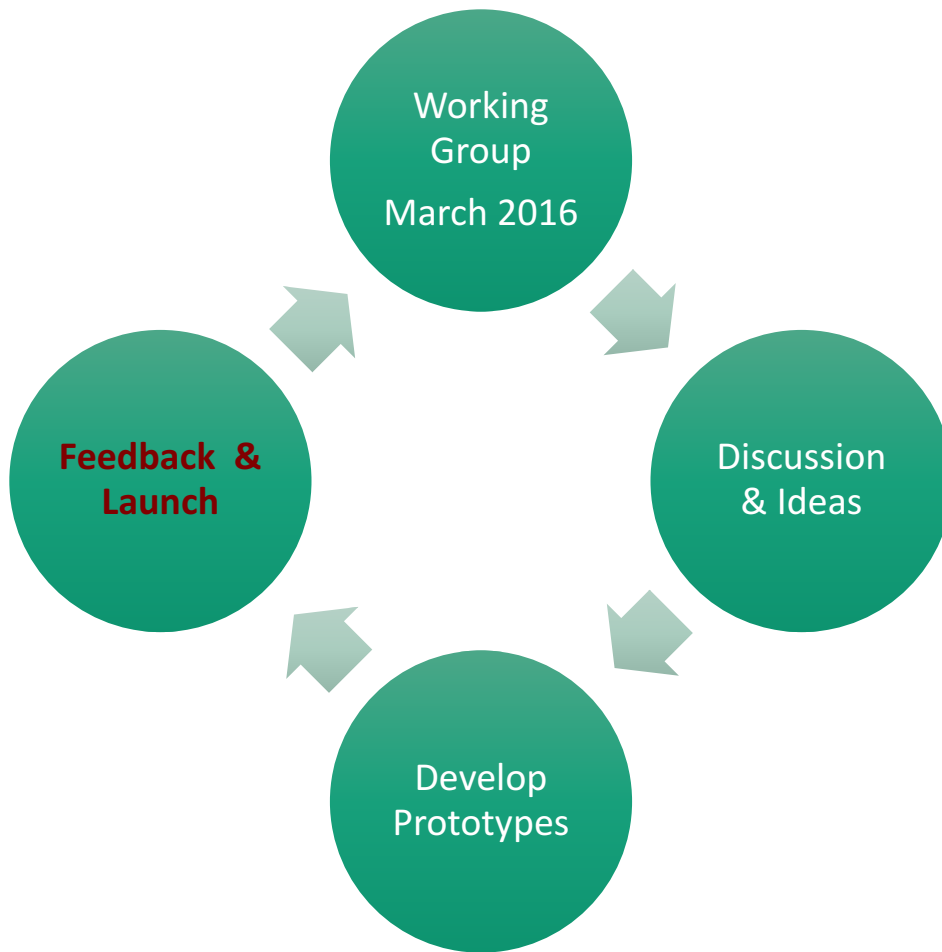
Thank you

[audrey.rorrer@uncc.edu](mailto:audrey.rorrer@uncc.edu)

# Appendices



# Future Toolkit: Alumni Tracking

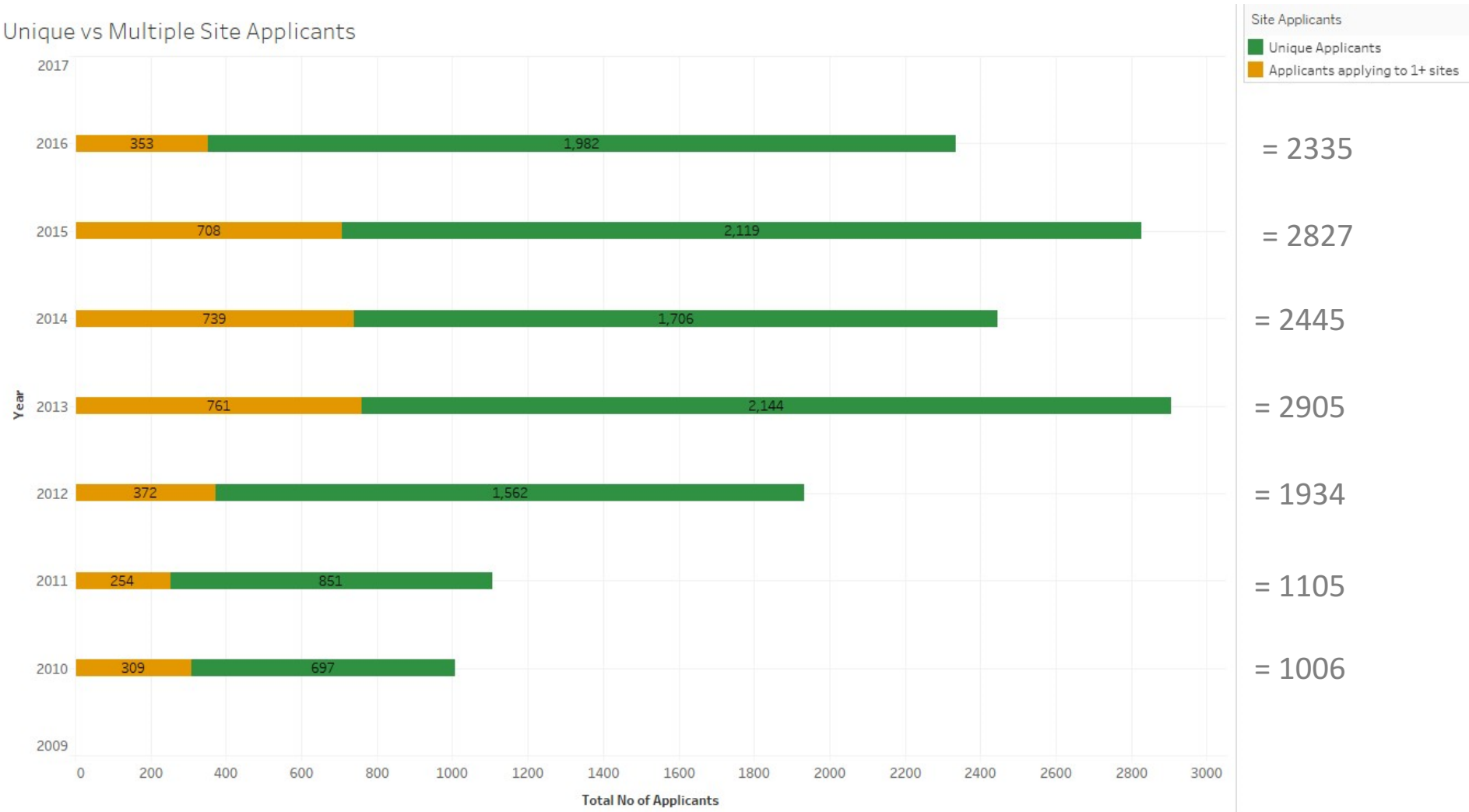


## Working Group Members:

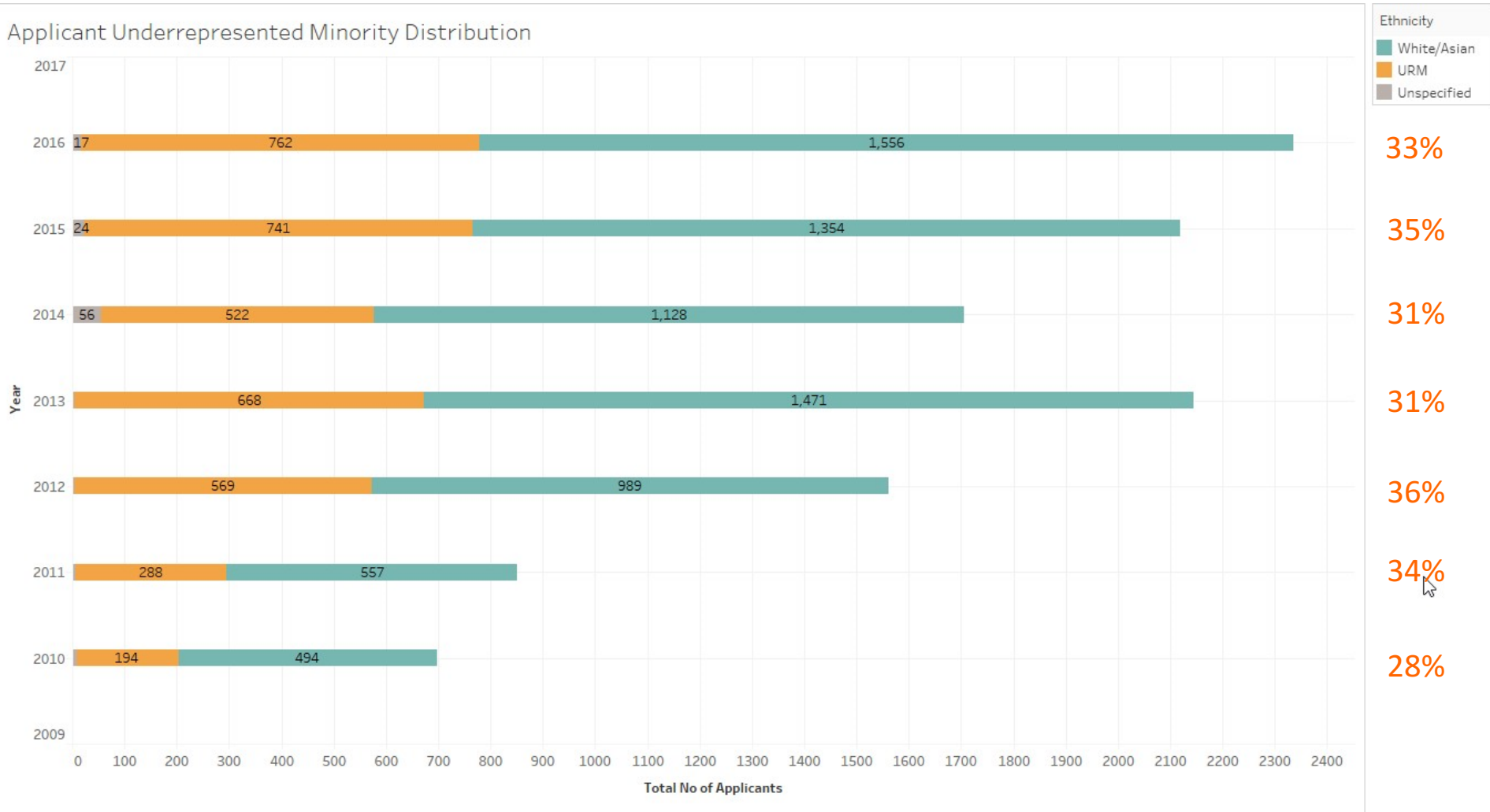
- Lazaros Gallos, Rutgers
- Claire Duggan, Northeastern U.
- Bonnie Swan, U. Central Florida
- Stephen Gilbert, Iowa State
- Tiffany Reardon, Berkeley
- Huirong Fu, Oakland
- Jamie Payton, UNC Charlotte
- Raja Kushalnagar, RIT

# Applicant Counts: Sites Applied To

Unique vs Multiple Site Applicants

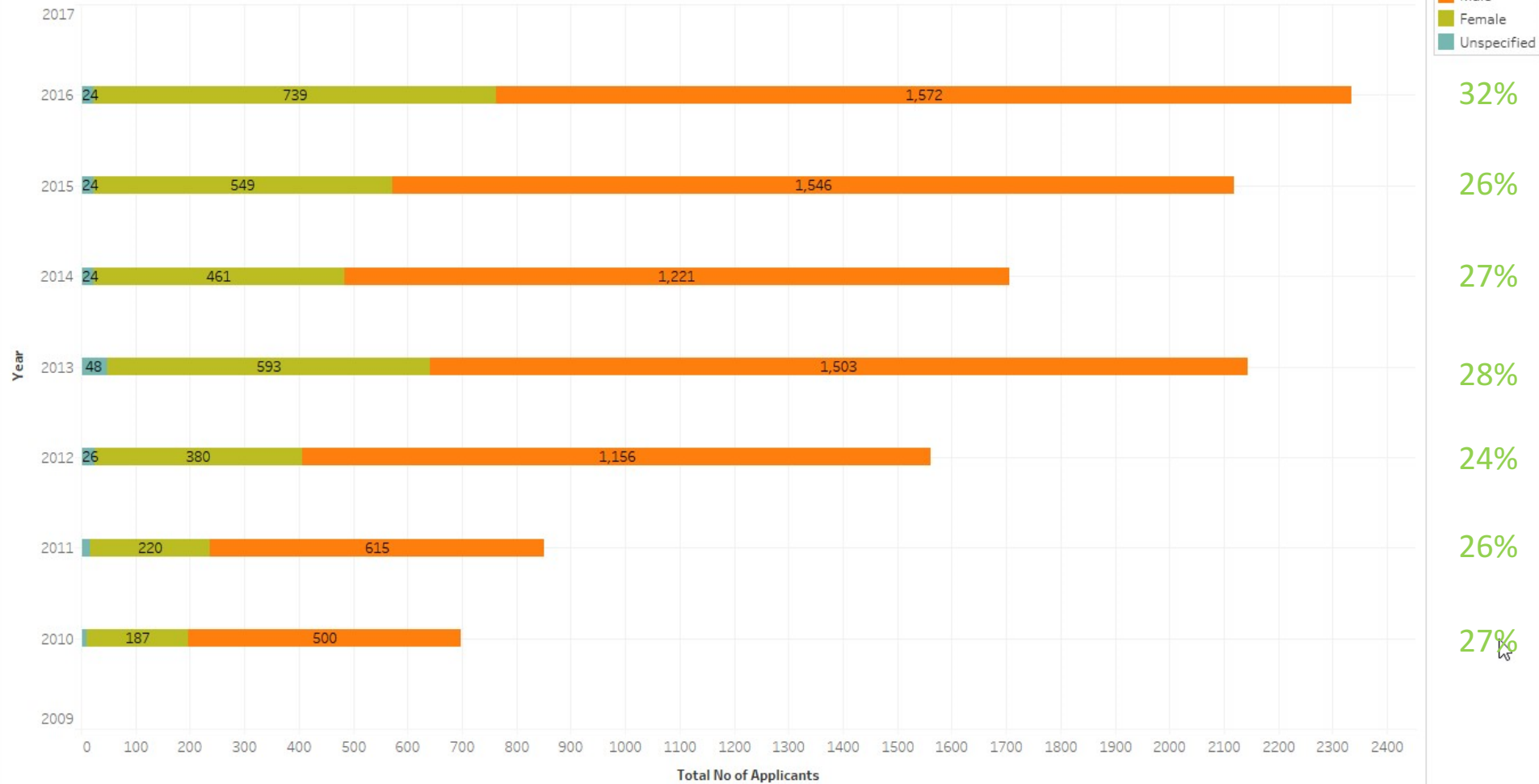


# Applicant Demographic Trends: Underrepresented Minority Distribution



# Applicant Demographic Trends: Gender Distribution

Applicant Gender Distribution

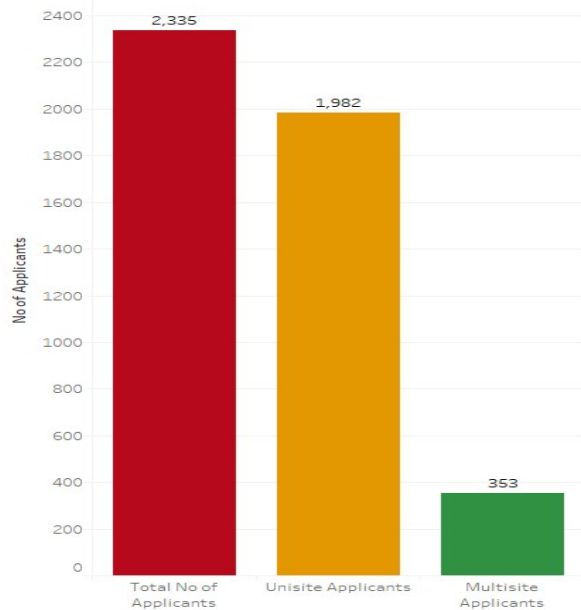


# Common Applications: Graduate School Plans

- Majority **plan to pursue graduate degrees**
  - 79% in 2013
  - 80% in 2014
  - 84% in 2015
  - 79% in 2016
- Few are first generation college students
  - Less than 20% across all 6 years
  - 17% are first person in family to attend college (2015)
  - 19% are first person in family to attend college (2016)

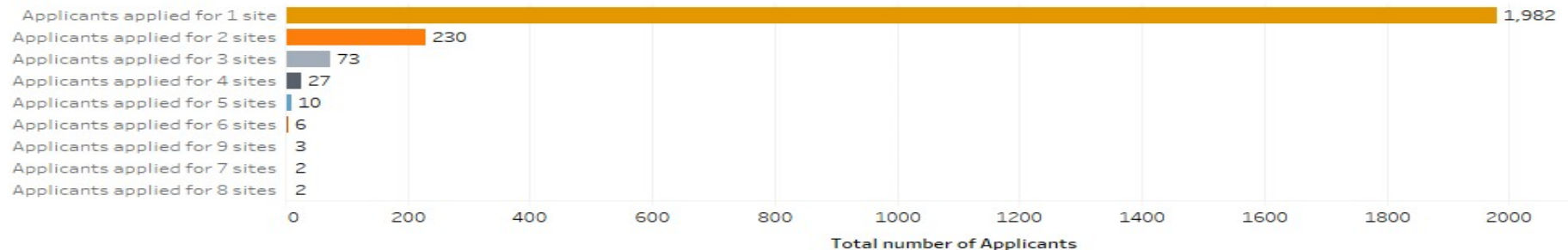
# 2016 Common Applicants: Unique

Unique vs Multiple Site Applicants



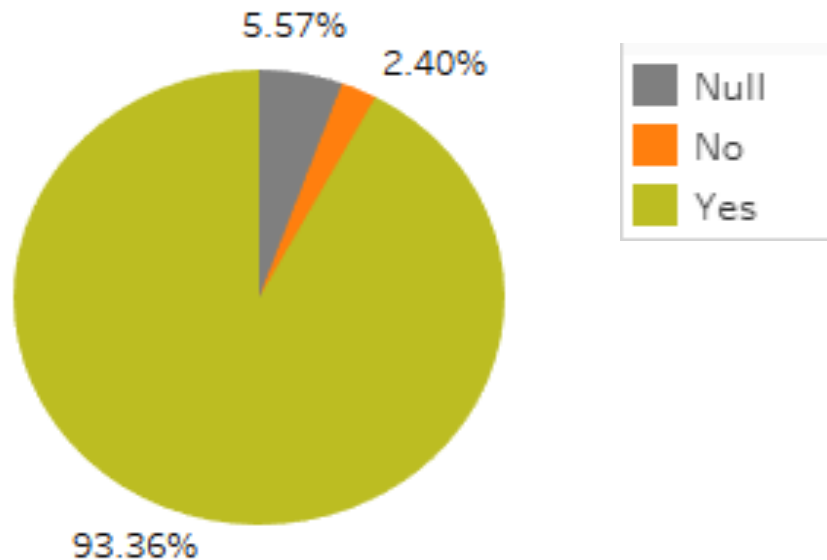
Measure Names  
■ Total No of Applicants  
■ Unisite Applicants  
■ Multisite Applicants

Applicants applied for one or more sites

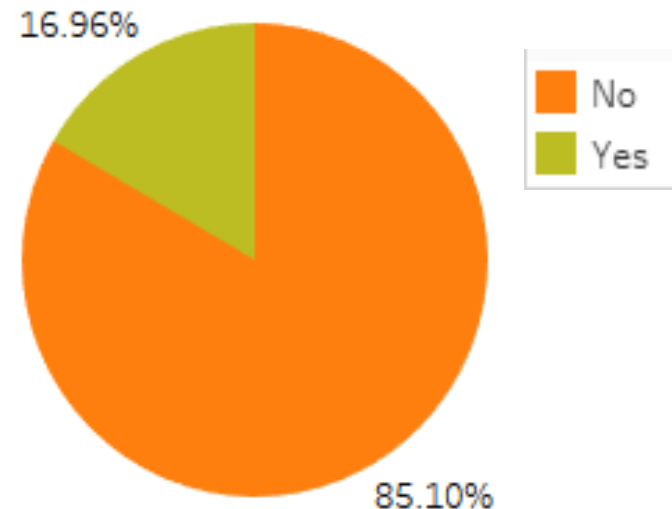


# 2016 Common Applicants: Consent

- Percentage of applicants who answered 'Yes' to have their application considered by additional CISE REU programs



- Percentage of applicants who answered 'yes' to opt out of participating in the research study



# A la Carte Student Survey

## Modular, pre/post assessment of student outcomes

- Self Efficacy
  - I can formulate a research problem
- Intent to attend graduate school
  - I plan to apply to graduate school in a computing discipline
- Attitudes towards computing
  - I like to use computer science to solve problems
- Help seeking/coping skills
  - When I do poorly on an exam, typically I....skip class
- GRIT
  - I am a hard worker
- Research Skills
  - Formulate a research hypothesis
  - Write a research paper for publication
- Leadership in Science
  - I know how to be good team member
  - I know how to encourage team performance
- Professional Identity as Scientist
  - I feel like I belong in science
- Mentoring Satisfaction (post-only)
  - My mentor was helpful in providing direction and guidance on research project issues



# Survey Instruments Available

- SURE- Survey of Undergraduate Research Experiences
  - D. Lapatto at Washington University
- URSSA- Undergraduate Research Student Self Assessment
  - University of Colorado Boulder, NSF
- Both are free for research programs and courses
- Adaptation made for the A la Carte

# History of Evaluation Project

## 2009 Working Group Members

Guy Alain Amousou  
Andy Fagg  
Sanjay Madrias

Chris Aberson  
Stephen Gilbert  
Joan Peckham

Wendy Cooper  
Manfred Huber  
Eric Wong

Teresa Dahlberg  
Niels Lobo  
Yu-Dong Yoa  
Kevin Zeng

