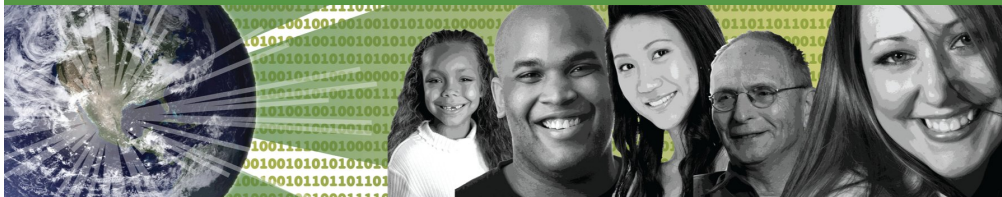




Broadening Your Impact

Andrew Bernat
Computing Research Association

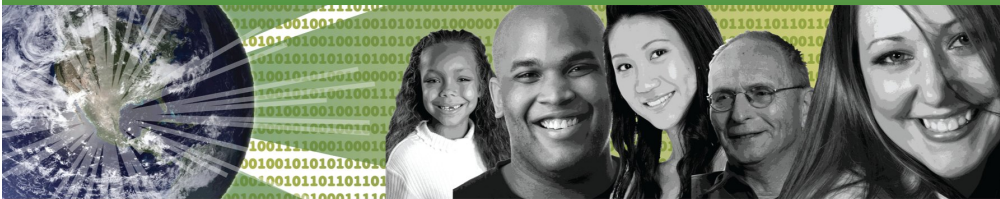


Broader Impacts For Research and Discovery Summit



CRA

seeks to strengthen research and advanced education in computing and allied fields. It does this by working to influence policy that impacts computing research, encouraging the development of human resources, contributing to the cohesiveness of the professional community and collecting and disseminating information about the importance and the state of computing research.



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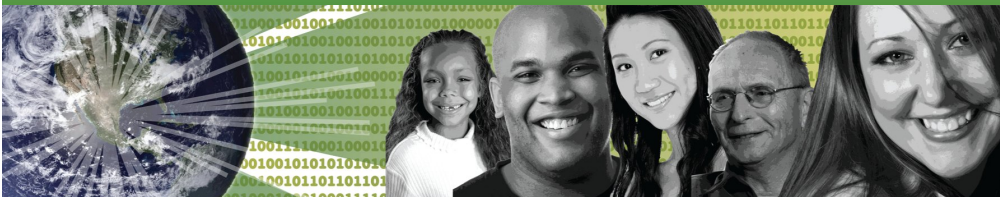


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CRA Broader Impact Activities


- Activities
 - CRA-E
 - CCC
 - CIFellows
 - CRA-W
 - CDC
- Evaluation varies by project
 - Anecdotal
 - Quantitative
 - Independent external



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Example: Letting Folks Know the Why of Your Research

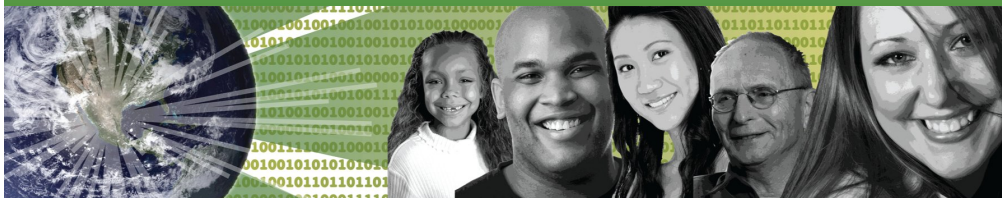


SECURITY
with
CERTAINTY

A future algorithmic breakthrough could render insecure all electronic commerce protocols currently in use.

However, theoretical computer scientists expect to remove this threat one day - by designing protocols that have unconditional proofs of security.

(i.e., why $P = ?$
NP matters to
everyone)



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Example: Letting Folks Know the Why of Your Research

Computing Research Highlight of the Week (June 3 – 10, 2010): Programming Visually with Sikuli

http://www.cra.org/ccc/rh-sikuli.php

Computing Community Consortium
We support the computing research community in creating compelling research visions and the mechanisms to realize these visions.

HOME YOUR VISION PLANS ACTIVITIES RESOURCES ABOUT CRA

COMPUTING RESEARCH HIGHLIGHT OF THE WEEK [June 3 – 10, 2010]

Programming Visually with Sikuli

For as long as there have been computers, there has been coding. And with coding comes repetition – lots of it. That's always been the basic fact of a programmer's existence, even as computers have become ever more friendly from a user's perspective.

That's where Sikuli comes in. The latest from the User Interface Design Group at MIT's Computer Science and Artificial Intelligence Laboratory, it's a programming tool that has the ability to see like a human being. Not only does it put the graphical user interface (or GUI) in the hands of programmers, but it may one day put programming in the hands of everyday computer users.

```
def darker(event):
    switchMusic("System Preferences")
    click(
        thumb = brightness.right(),
        dragTo(thumb, brightness.getCenter(bright(100))
    stopObserver()
    varVarch(30,cheat,darker)
    observe()
```

Sikuli stemmed from the research of Associate Professor Rob Miller, Ph.D. student Tsung-Hsiang Chang, and University of Maryland post-doctoral researcher Tom Yeh. It's a software agent that allows one to quickly automate just about any task – so long as there's a GUI involved. Sikuli enables the programming of tasks through a combination of screenshots and simple commands.

The key to Sikuli's appeal is how intuitive it is, something that has rarely if ever been true of programming before. Sikuli users can script what look like function calls, except with screenshots between the parentheses instead of code. This type of interface allows for use by beginners and seasoned programmers alike.

At this point in its development, more involved Sikuli use requires some understanding of Python. But a streamlined, novice-friendly Sikuli could one day put programming into the hands of the average computer user. It would mean a sort of democratization of computing, and would have far-reaching cultural implications.

"You can look at it as an augmentation of human capability," Miller observes. "Which is pretty exciting, because we're not really getting much smarter biologically. I think we need to find ways to make ourselves smarter technologically."

Researchers:
Rob Miller (Massachusetts Institute of Technology)

Relevant Links
[Press Release](#)
[Project Web Page](#)
[Research Papers](#)
[Media Contact](#)

Keywords
 Sikuli, GUI, programming, MIT, Computer Science and Artificial Intelligence Lab, Rob Miller, computer vision

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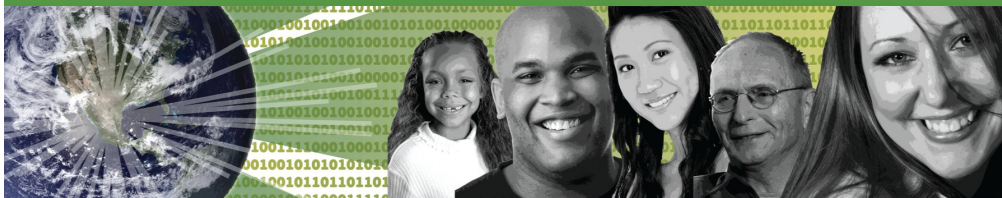




Example: Getting Students Involved

CRA-W/CDC have many programs

- Distributed Research Experiences for Undergraduates (DREU)
- Discipline-specific Mentoring Workshops
- ...



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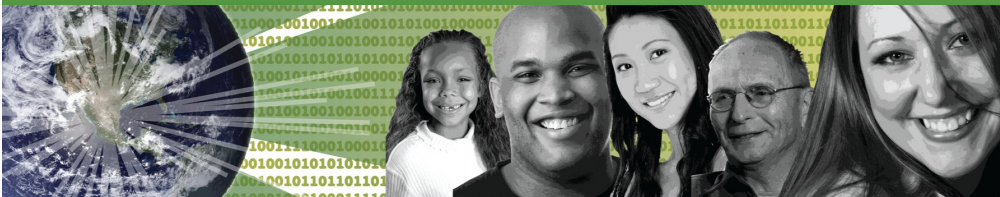


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Example: CIFellows

As the hiring officer for this position, I can attest that her postdoctoral experience at [top 10 NRC-ranked department] enhanced her attractiveness to us as a candidate. In our small isolated department it is difficult for Assistant Professors to succeed coming directly out of graduate school. We also liked that she had spent time at one of the better departments in the country, which supports the "max 2" policy. ... It's a great program and deserves to continue!

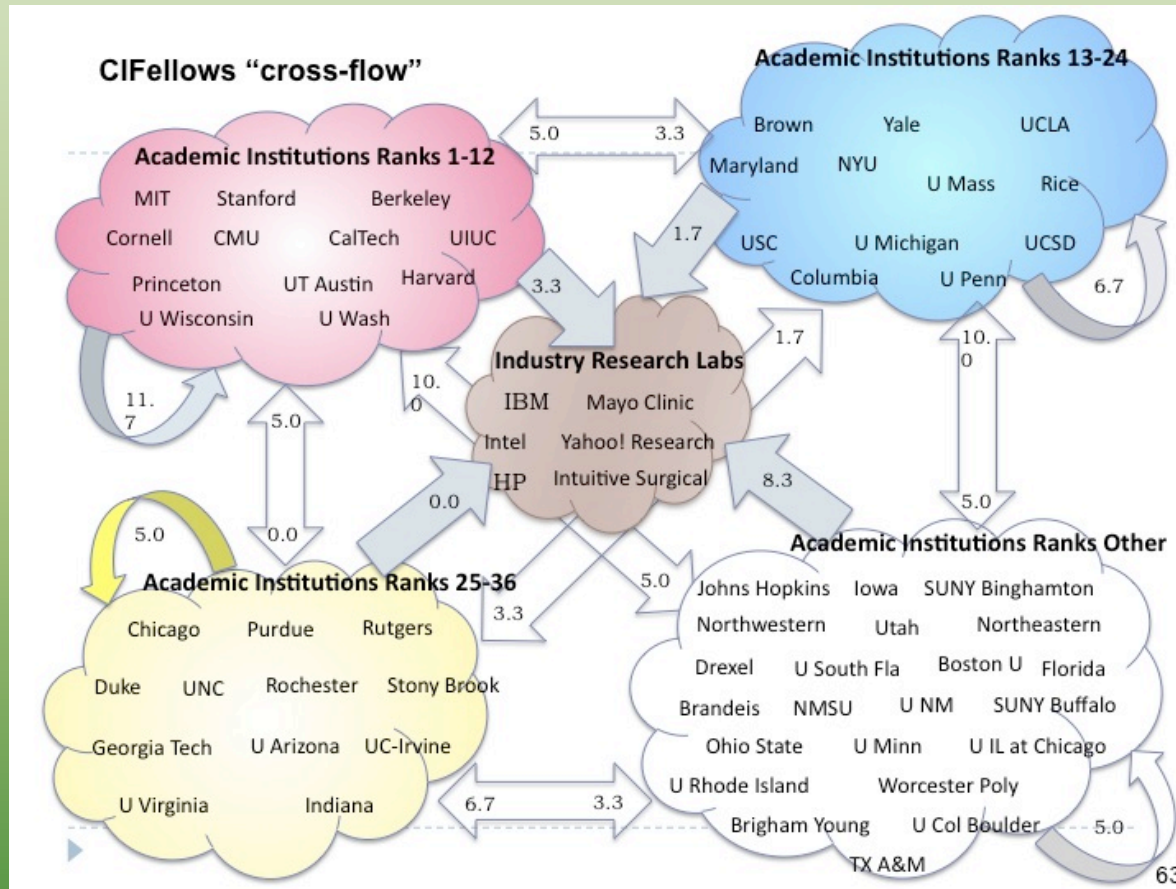


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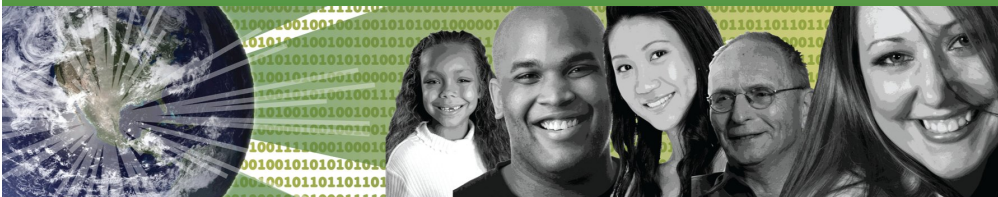




Example: CIFellows



(i.e., designed to have broader impact)



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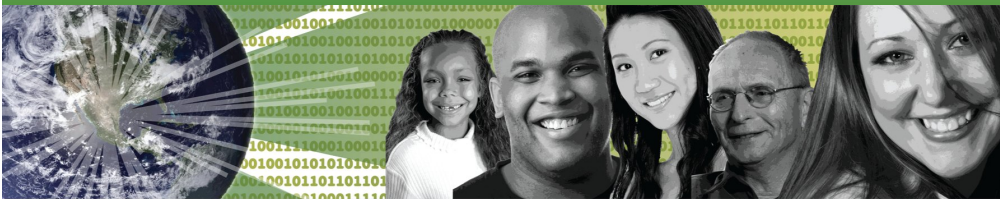
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A GOOD Activity ...

- explains why your research matters
- attracts interest from
 - students
 - funders
 - public
- impacts your work and your context



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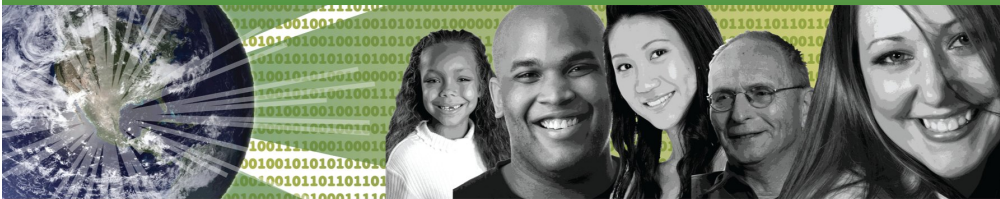
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Join Us!

- CRA-E
 - Impact on computing education
- CRA-W and CDC
 - Undergraduate research and education
 - Graduate research and education
- Computing Community Consortium
 - Creating research futures
 - Communicating computing research



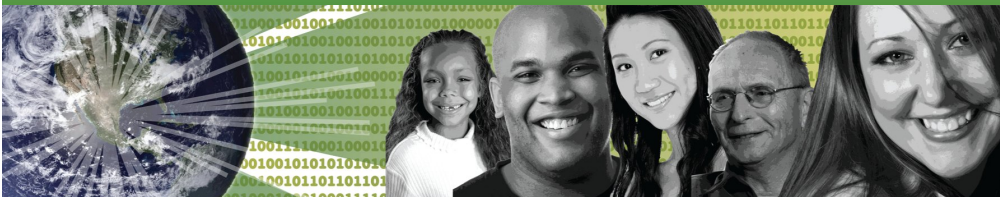
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My Advice

- Take Broader Impact seriously
 - NSF appears to be
 - Program Officers appear to be
 - Reviewers might
 - The taxpayer deserves it
- Partner with others
 - CRA can help



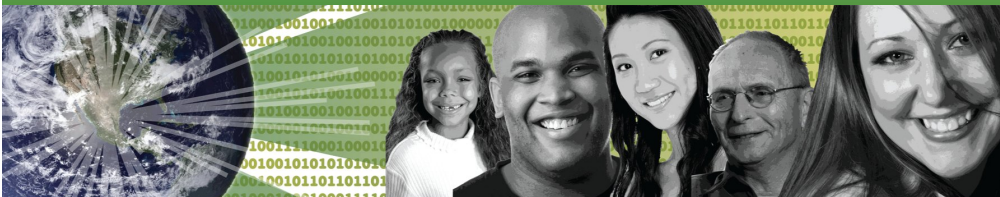
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