



# Educational Outreach: Encouraging the study of SCADA and CPS

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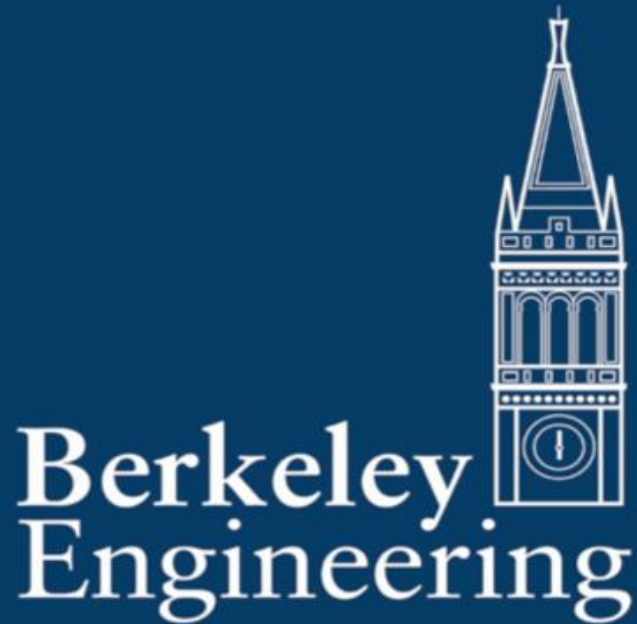
# Berkeley Girls in Engineering



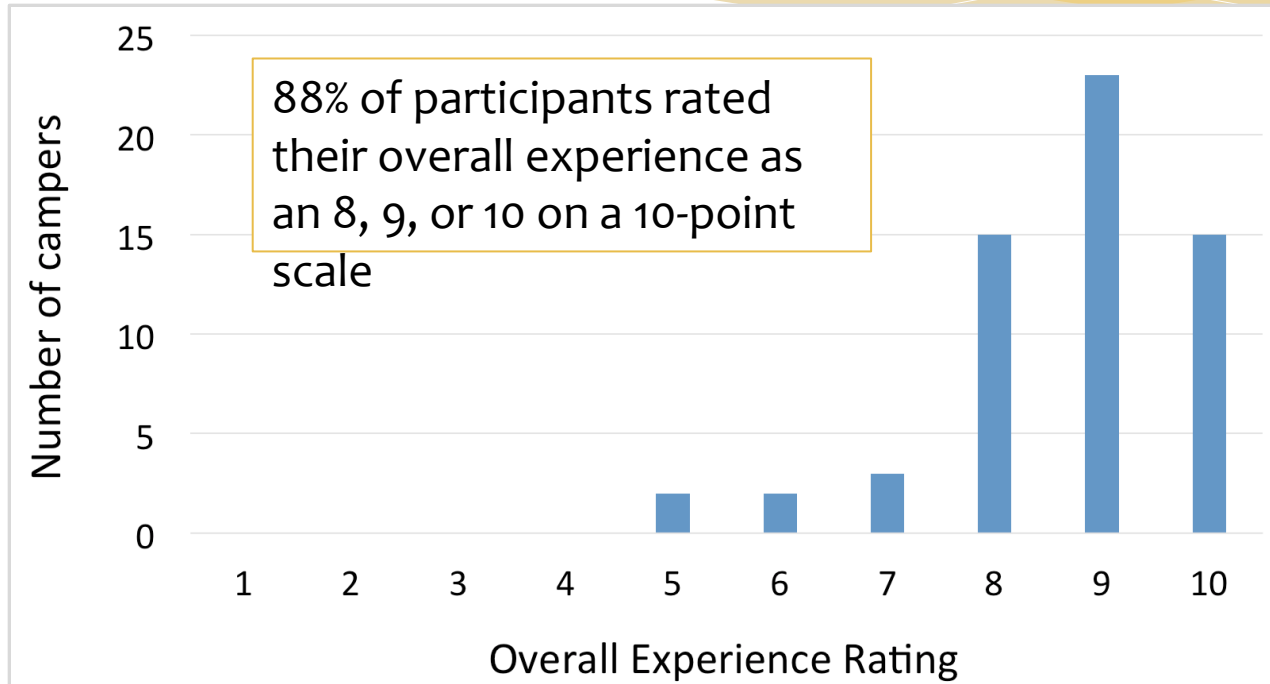
“It teaches individuals about different types of Engineering and how it is a positive influence on the world. It also works with amazing ladies!”

[2015 camper]

# Berkeley GiE: Video



# Berkeley GiE: 2015 Survey Results



- \* Survey results were overwhelmingly positive
- \* 95% of the campers would recommend the camp
- \* 100% of parents would recommend the camp



# Berkeley GiE: Program Structure

- \* 1-week sessions at UC Berkeley
- \* 30 middle school girls per session
- \* Female faculty/staff/students run hands-on workshops
- \* Girls work on team projects throughout the week; present projects to family/friends on Friday
- \* Camp also includes a field trip to a local company

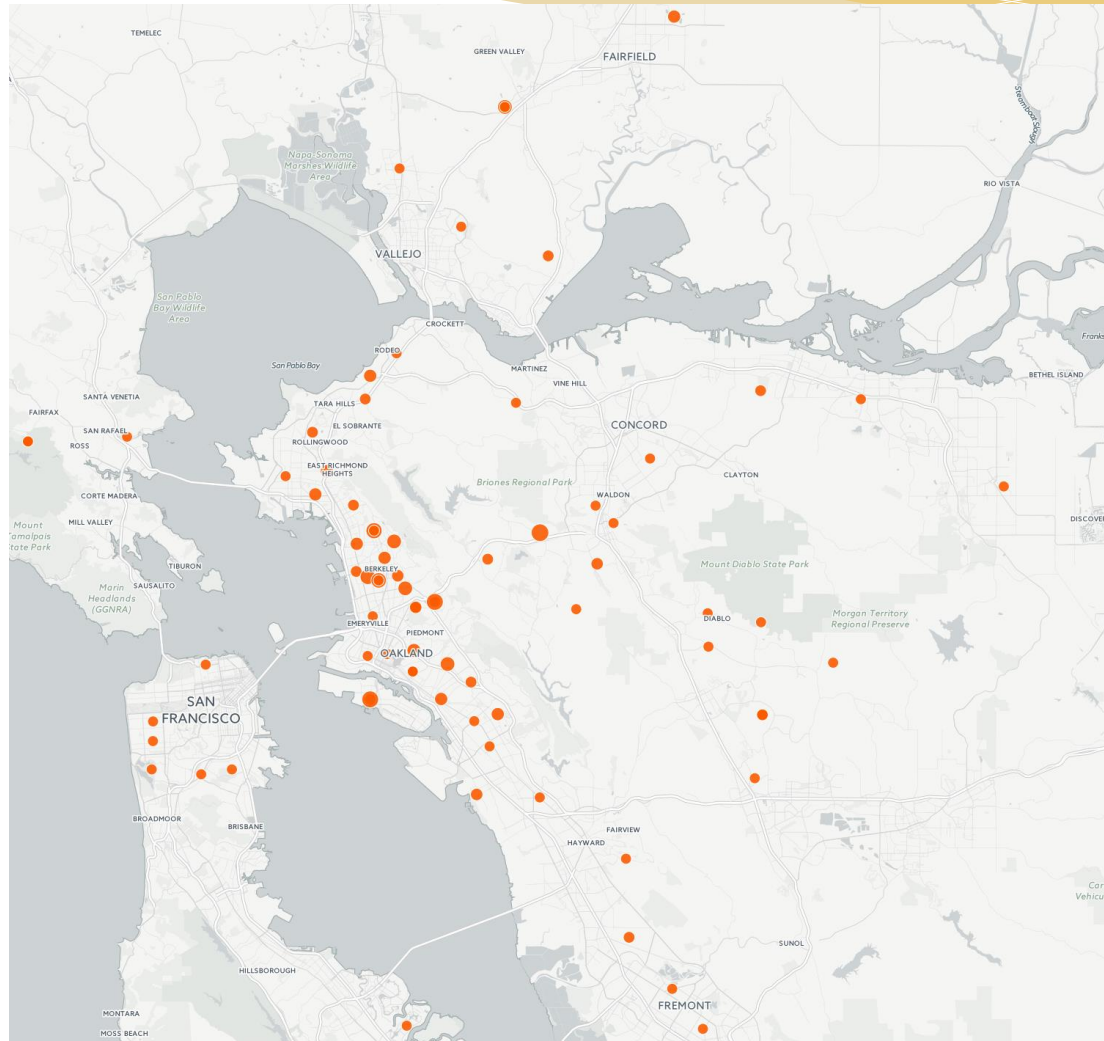


# Berkeley GiE: Summer 2016

- \* Doubled number of sessions to 4
- \* Expanded eligibility to all girls in the Bay Area
- \* 338 girls applied for 120 spots
- \* 13 high school students are volunteering for GiE
- More female faculty participating in 2016 camps (as lead faculty participants)



# Berkeley GiE: 2016 Applicants



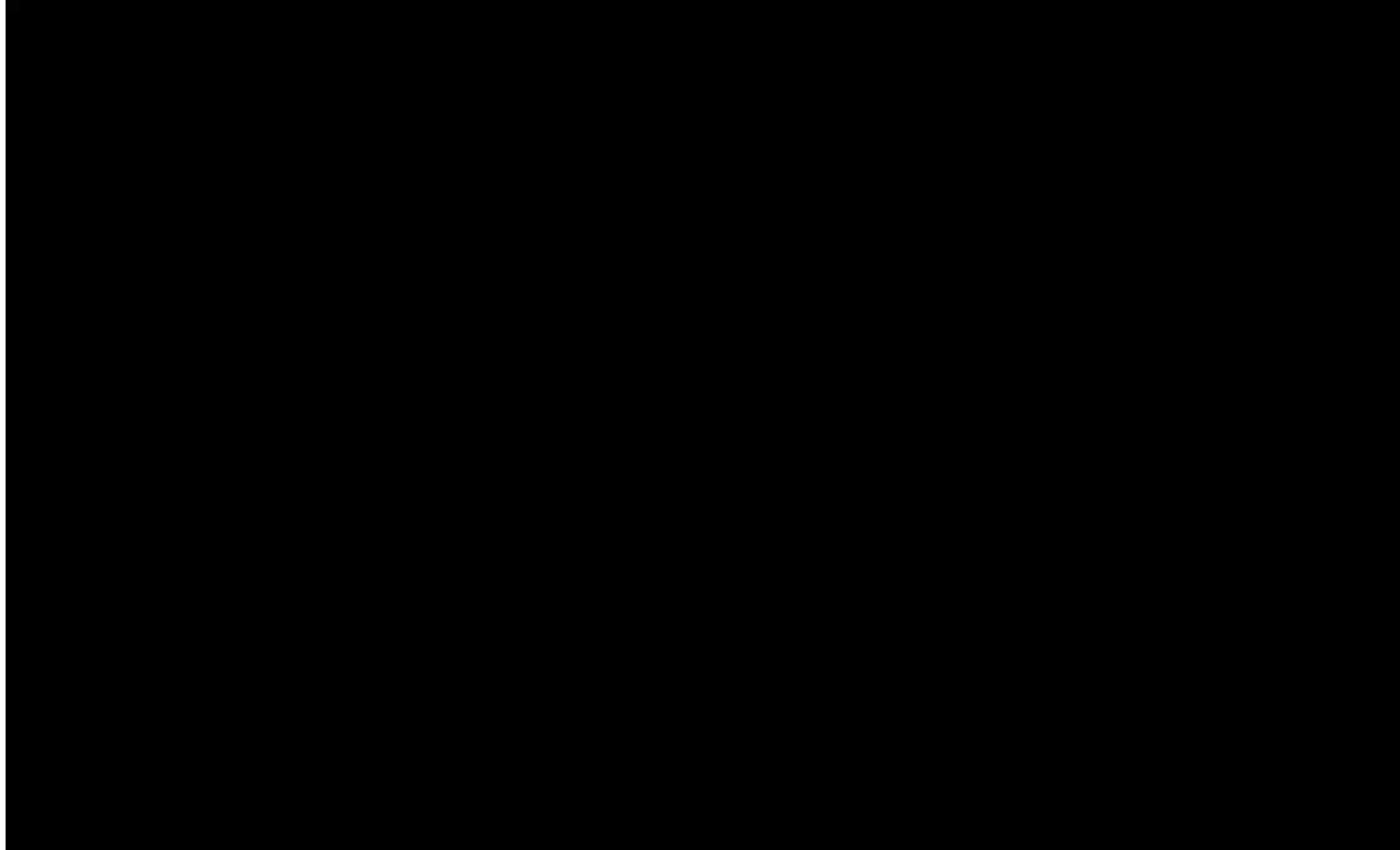


# Berkeley GenCyber Camp: CYBEAR 2015

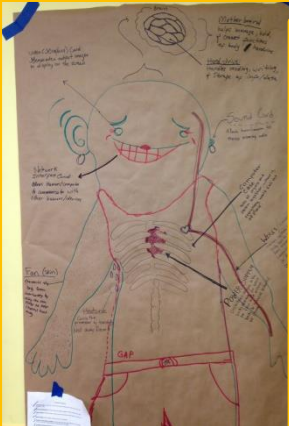




# Berkeley GenCyber Camp: CYBEAR 2015



# Berkeley GenCyber Camp: CYBEAR 2015



## ADWARE & SPYWARE

### COOL WEBSEARCH

Info: of dangerous browser changing adware.

**Adware:** Software that displays featured ads and can report user's browsing activities to the

**Spyware:** Software that performs certain behavior without user's consent

#### Epidemiology

- Origin: Russian Company (established 2001)
- Started as a dangerous browser hijacker
- Used to promote malware, to gain website traffic
- Now it spread: Drive by 2 weeks before
- Can hijack computer browsers a web page automatically install, CoolWebSearch virus, can infect in 2007 and 2008
- Spread: B/c computer rank up to date, custom hacked websites are open usage
- Cost to society: One of the first browser hijackers -> because
- Fun Facts: Since emergence, they have accumulated 100+ million hits on their website and 100+ million of "attacked" visitors

#### Psychologist

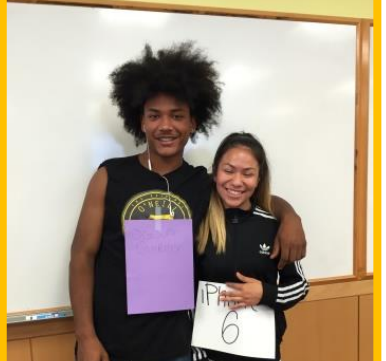
Human nature is shaped and can be influenced by the variables, cultural, upbringing, experience, cooperation, etc. A person can be motivated at the individual or mass perception with various human programs. A person can be influenced by the behavior of others, aware of their negative behavior. This can be categorized as social learning. Individuals do not learn for personal gain, unless reward or loss of learning. Learning is not only about the learning, but also about the learning. Learning is not only about the learning, but also about the learning. Learning is not only about the learning, but also about the learning.

#### Symptoms

- \* Slower computer performance
- \* Browser search page & search engine changed to CoolWebSearch.com
- \* Pop-ups that refuse to be removed
- \* Spies on browsing activities

#### Affected Hardware

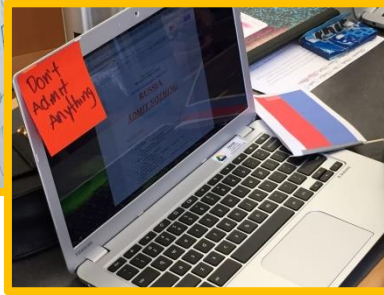
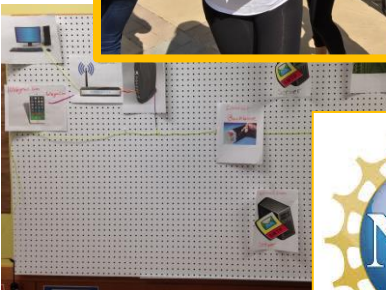
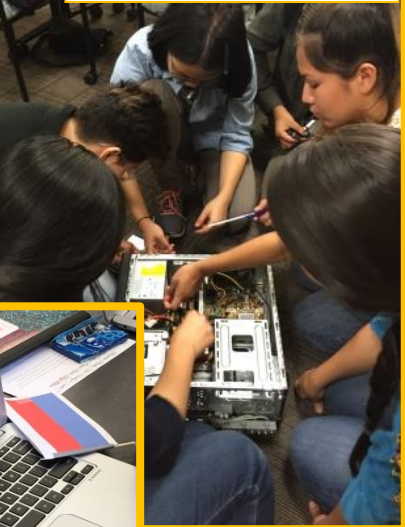
- \* CPU - Slower computer performance due to software making constant demands
- \* RAM - Large RAM is not being used



Mississippi Summer Transportation Institute



Sir Chairman  
Ban Ki Moon  
Elk Core  
Pillar of Cyber  
Wisdom  
Don't Adapt Anything



# Berkeley CYBEAR 2015: Preliminary Results

- \* **Children's Attitudes Towards Technology** -0.49 SD (Cohen's  $d = -0.67^*$ ,  $p < .05$ )
  - \* Gender explained variance (13%, R-squared=0.13)
  - \* Still significant controlling for both gender and ethnicity
- \* **Critical Thinking in Everyday Life** .32 SD (Cohen's  $d = 0.58$ ,  $p < .05$ )
  - \* Significantly moderated by gender and ethnicity
  - \* Gender (15%, R-squared=0.15)
  - \* 5. *"I can easily express my thoughts on a problem"*
  - \* .42 SDs with a medium effect size (Cohen's  $d=0.58$ ,  $p < .05$ )

In GenCyber's internal assessment of all 34 camps in 2015, CyBEAR scored highest on all metrics.

\* Children's Attitudes Towards Technology is reverse coded



# Berkeley GenCyber Camp: CYBEAR

## 2015

- \* 4 week program, 22 students
- \* 50% of the fathers and 36% of the mothers have less than an Associate's Degree.
- \* 95% of the students are from schools where they do not have a computer science class
- \* 55% Female
- \* 64% Underrepresented

## 2016

- \* 6 week program, 24 students
- \* 50% of the fathers and 41.67% of the mothers have less than an Associate's Degree.
- \* Percentage with access to computing classes at their schools: n/a
- \* 33% Female
- \* 66% Underrepresented

# Berkeley GenCyber Camp: CYBEAR

- \* **Explicit CPS and SCADA units with associated projects**
  - \* LEGO City:
    - \* Integrated City of Systems and their networking
  - \* Final Projects: Students re-envision these systems to meet the needs of their own neighborhoods utilizing Google Maps



# Videos for Dissemination: CyBear 2016

- \* Importance of CPS and the various systems that interact with it
- \* Structures, Vulnerabilities, & Solutions
  - \* Sustainable Energy and Transportation
  - \* Connected Communities and Civic Technology
- \* There will be three videos in total



# Expanded Research Agenda

- \* **Collaborative study with Mississippi State's GenCyber Camp (Bulldog Bytes: Cyber Dawgs and Digital Divas)**
  - \* Impact of discrete interventions to shift subjects' perception of women's ability to be successful in cyber security and STEM fields.
- \* **Develop standalone CPS/SCADA unit** to share with other STEM enrichment programs increase students' interest in CPS and SCADA .
  - \* *Mississippi State's GenCyber Program and The Mississippi Summer Transportation Institute, and the University of Alaska, Fairbanks are being approached regarding piloting this initiative, other partners are being sought.*