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]

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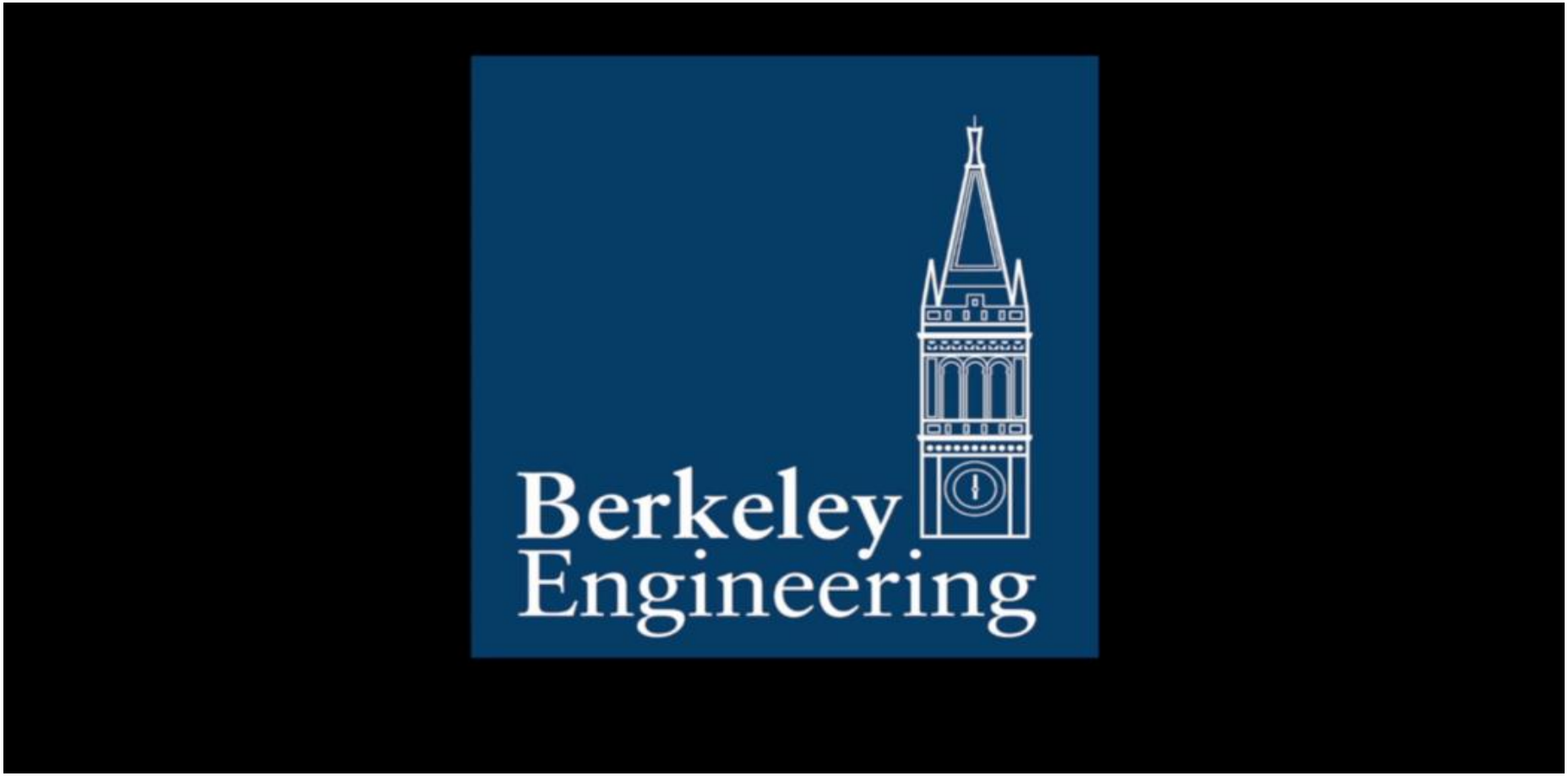
NSF

ActionWebs

Berkeley GiE: Video



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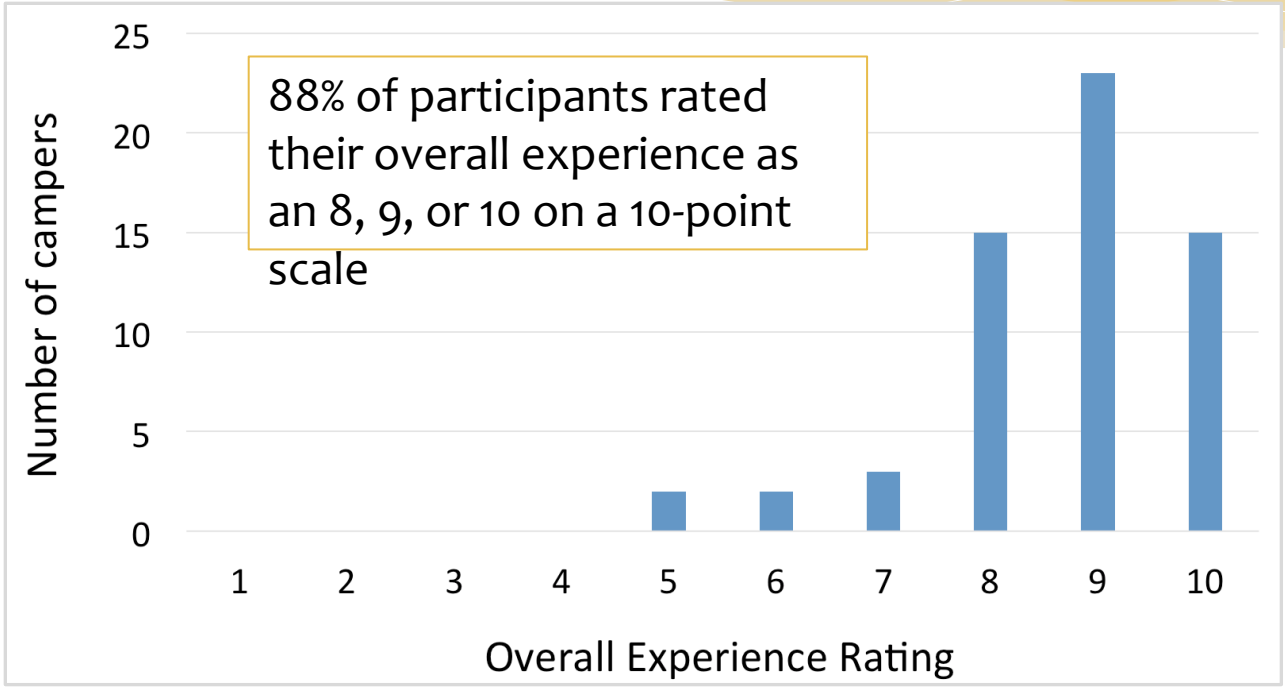
Berkeley GiE: 2015 Survey Results



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

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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

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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)

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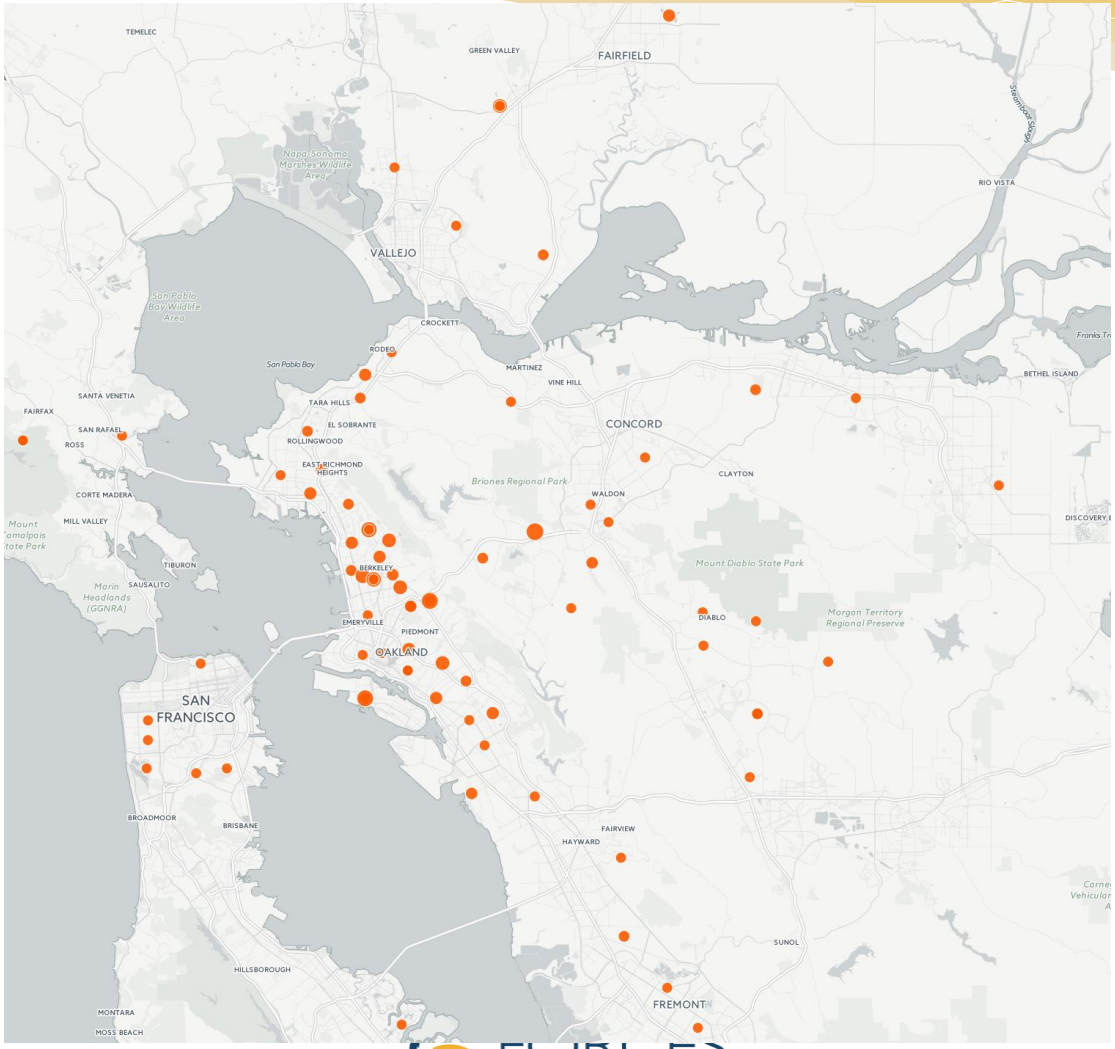
Berkeley GiE: 2016 Applicants



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Berkeley GenCyber Camp: CYBEAR 2015

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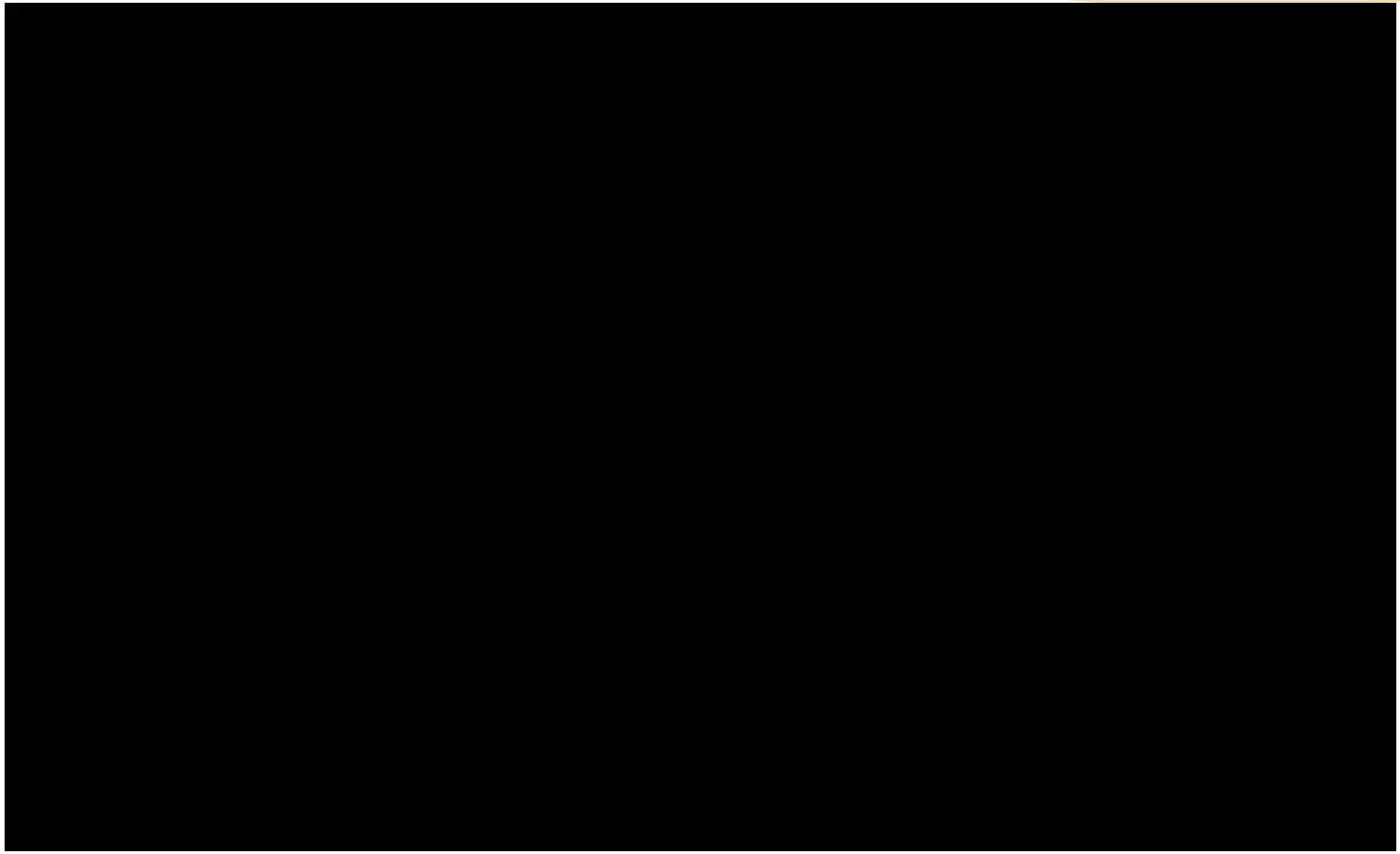

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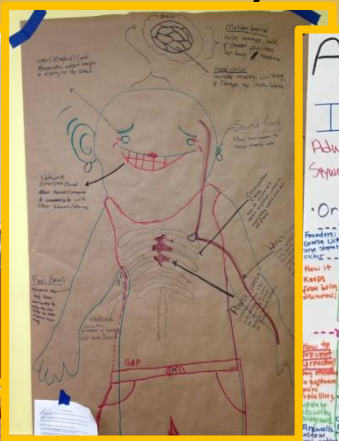
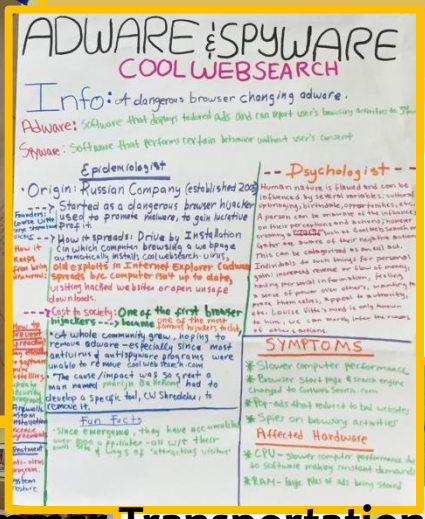
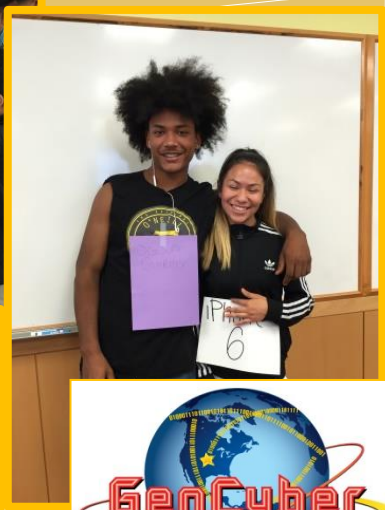
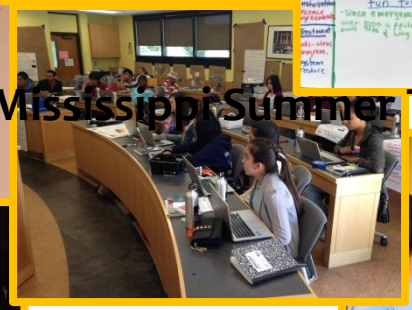
Berkeley GenCyber Camp: CYBEAR 2015

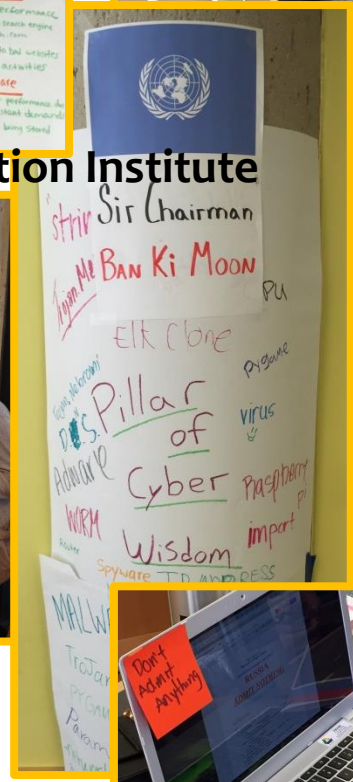


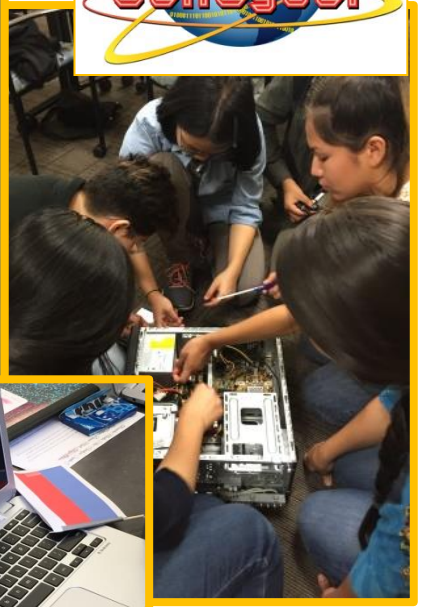


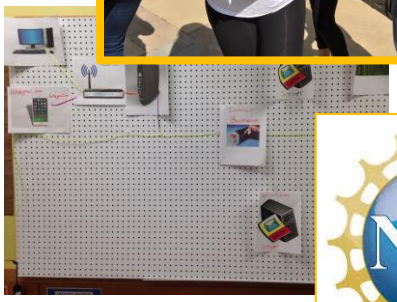


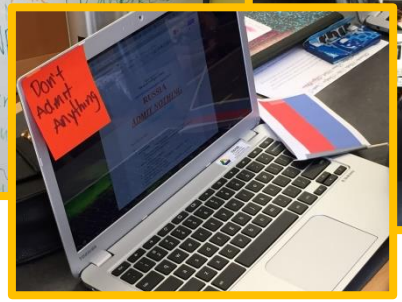


Mississippi Summer Transportation Institute









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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

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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

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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

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Expanded Research Agenda

* **Collaborative study with Mississippi State's GenCybear 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.

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