

Topic

Improving the enrollment and retention of women in tech around the greater NJ/NYC area, as well as providing them with the resources to succeed in computer science.

Problem

Although skilled service jobs such as computer scientists and software engineers are in high demand, women are still either excluded or deterred from accessing these career opportunities. The percentage of female computer scientists is increasing at slower rates, and is even decreasing in some sub-fields. This represents a pressing problem where job markets can't fill positions unless the industry improves upon its abysmally poor state of gender equality. There are four main barriers to women pursuing computer science:

- Computer Science is societally marketed as a major 'for men', which has a chilling effect on young women, starting around the 5th grade.
- The lack of women in prominent positions of tech (i.e. Elon Musk, Steve Wozniak, Bill Gates) reinforces the notion that it is male-exclusive.
- Women are more likely to experience gendered insults, be harassed by peers, and face other underreported glass ceilings when attempting to enter the tech industry.
- Ellen Spertus from MIT writes that the level of computer scientists differs with gender. For example, a male pursuing computer science in college has a significantly higher chance of possessing basic coding experience than his female counterpart.

Population

The Rhode Island Department of Labor and Training reports that around 10% ~ 24% women (sub-field dependent) out of a total regional population of 250,000 computer scientists equates to a total of 25,000 ~ 60,000 women currently in the industry.

The short-term goal is to add 5000 women in tech over a period of 6 years. The long-term goal is to raise the gender percentage between 40% ~ 50% over a period of 10+ years.

Have other people recognized the problem and tried to solve it? (Paradigm)

Several organizations have recognized the problem regarding the lack of women in tech:

- Anita Borg Institute for Women in Technology
- Institute of Electrical and Electronics Engineers (IEEE)
- Rutgers Women in Computer Science (WiCS)
- HackHers, a hackthon (24-hour coding marathon) for women in CS
- Undergraduate Student Alliance of Computer Scientists (USACS)

Where do you find experts on the topic? (Paradigm)

- Universities
- Think tanks such as Nokia Bell Labs
- Private sector professionals
- Undergraduate/Graduate female students

Who are the experts? (Paradigm)

- Sarah-Jane Leslie, Princeton University, Professor of Philosophy.
- Dr. Bhavani Thuraisingham, UT Dallas, Jr. Distinguished Professor of Computer Science.
- Eric S. Roberts, Stanford University, Professor of Computer Science *emeritus*.
- Marina Kassianidou, Stanford University, Assistant Professor, Art & Art History.
- Lilly Irani, UC San Diego, Assistant Professor, Communication & Science Studies.
- Undergraduate/graduate students at institutions such as Rutgers, NYU, Columbia, The Cooper Union, Rowan, NJIT, TCNJ.

What do you think you might do? (Plan)

- Establish and strengthen college mentorship programs between new and experienced students.
 - Mentorship programs already exist at many universities.
 - Should shift focus on training mentors to take on middle and high school mentees.
- Organize hackathons (described previously) at middle school, high school, and collegiate levels.
 - Offer existing college hackathon infrastructure to prospective hackathons.
 - Set up a network of high school districts and administrators who can support annual school hackathons.
 - These events will provide an entry point into coding, networking, and other useful programs, specifically for women.
 - ex) HackFree, a very successful hackathon held at Manalapan High School in January of 2017. Roughly half of the attendees were women.
- Develop accessible class, coding, and interview resources for women who wish to succeed.
 - Many resources already exist for college students - need to compile and organize it into an easy-to ready database.
 - Also need to market it to prospective female CS students.
 - Have undergraduate women coders go and give talks to middle/high schools.
 - ex) Google has already come to Rutgers to train mentors and do technical interview preparation.
- Increase the number of women role models in tech.
 - Set up more conferences in the NY area for women.
 - Use Rutgers' annual hackathon, the HackRU, to set up a small event where

women can discuss tech.

- Reach out to existing role models' legacies such as:
 - Grace Hopper (designed infrastructure for modern computers and computer science).
 - Margaret Hamilton (developed the software that put Neil Armstrong and Buzz Aldrin on the Moon).
 - Anita Borg (worked on early Operating Systems infrastructure).

How much would that cost? (Price & Patron)

- Hackathons require anywhere from \$10k - \$50k:
 - Companies sponsor hackathons, and have already taken contracts up to \$35k
 - Universities have a precedent of financing anywhere from 15% - 100% of hackathon costs. The average ranges around 25% - 45%.
 - ex) Grace Hopper, hosted by the Anita Borg Institute, is sponsored by Apple, Google, Two Sigma, etc.
 - ex) WECODE (Women Engineers CODE) hosted by Harvard is sponsored by Google, Capital One, Microsoft, etc.
 - Some organizations are specifically set up to help, run, and grow hackathon communities.
 - Ex) Major League Hacking (MLH) provides equipment, mentors, guidance, and other helpful resources.
- Mentorship programs are free:
 - Co-opt infrastructure and resources of existing CS organizations
 - ex) Rutgers USACS Mentorship Program
 - ex) HackNY Mentorship Program
 - Companies, especially local tech businesses like Commvault, are willing to sponsor these programs for name recognition and prospective talent.
 - (Unclear with the current administration): some programs have successfully applied for grants and financial support.

Works Cited

Ellen Spertus. Why are There so Few Female Computer Scientists? c 1991,
<ftp://publications.ai.mit.edu/ai-publications/pdf/AITR-1315.pdf>

Rhode Island Department of Labor and Training. "United States Labor Force Statistics
Seasonally Adjusted". Labor Market Information. October 2016,
<http://www.dlt.ri.gov/lmi/laus/us/usadj.htm>