

Women in Computer Science

Presented by

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Topics

- My heroines
- Women's contributions
- Some statistics
- Possible explanations for statistics
- My story
- Discussion

My Heroines

- Ada Lovelace
- Hedy Lamarr
- Top-secret Rosies
- Grace Hopper
- Radia Perlman
- Sandy Lerner
- My mother 😊

Ada Lovelace, 1815-1852



- Daughter of Lord Byron
- With Charles Babbage created plans for an Analytical Engine,
 - a machine capable of “developping [sic] and tabulating any function whatever”

Hedy Lamarr, 1913-2000



- Actress and co-inventor of spread-spectrum communications
 - Used by wireless networks and cell phones today!

Top-Secret Rosies



- 80 women worked at the University of Pennsylvania during World War II calculating ballistics trajectories on the ENIAC computer
- First computer programmers

Grace Hopper, 1906-1992



- Admiral in the U.S. Navy
- Invented the compiler, an intermediate program that translates English language instructions into the language of a computer

Radia Perlman, PhD



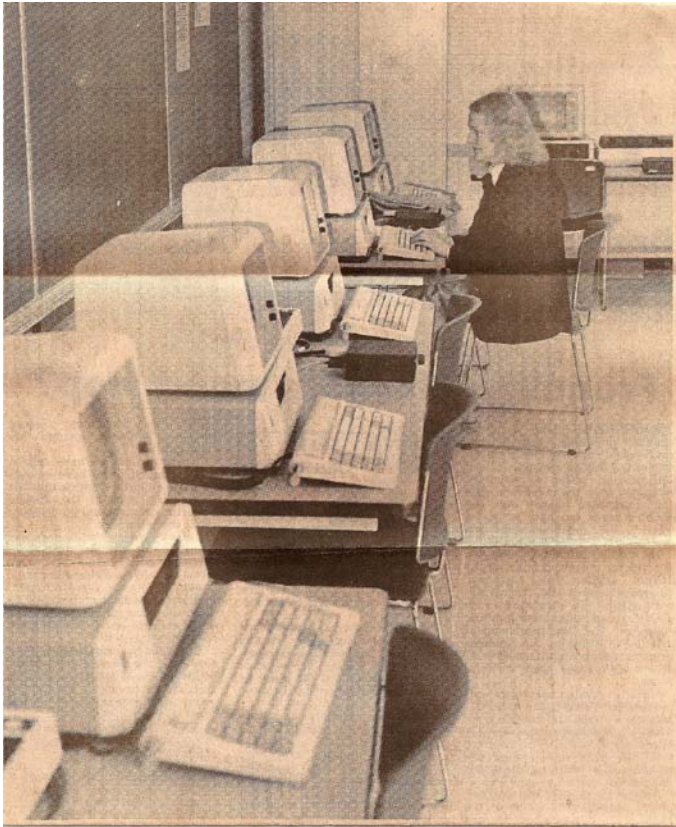
- Intel Fellow
- Inventor of the Spanning-Tree Algorithm for switches
- Her thesis on routing in the presence of malicious failures remains the most important work in routing security.

Sandy Lerner



- Co-founder of Cisco Systems
- Went on to found Urban Decay Cosmetics
 - Does pink make you puke?
 - No animal testing
- Environmentalist

My Mother, 1923-2011



- Economics professor
- Taught her students BASIC programming
- Focused on solving real-world problems such as how much product to produce to be profitable

Women's Contributions

- Applications-orientation, understand the business case
- Collaboration
- Analytical, synthesizing, holistic thinking
- Good at design, troubleshooting
- Good at networking and communications
- Superb programmers

Taulbee Survey

- Survey is conducted annually by the Computing Research Association (CRA) to document trends in computer science and engineering student enrollment, employment of graduates, faculty hiring, etc.
- Information is gathered during the Fall from PhD-granting institutions.

2009-2010 Survey

- A total of 265 departments were surveyed.
- The response rate was 74%.
- Undergraduate CS enrollment is rising; doctoral production is steady.
- Diversity problem persists, but is not as bad as it was the last couple years.

2009-2010 Survey

- 18.8% of PhDs in Computer Science (CS) were earned by women.
- 15.4% of PhDs in Computer Engineering (CE) were earned by women.
- 21.0% of MS degrees in CS were earned by women.
- 22.4% of MS degrees in CE were earned by women.
- 13.8% of Bachelor's degrees in CS were earned by women.
- 10.4% of Bachelor's degrees in CE were earned by women.

2009-2010 Survey

- Gender of newly hired faculty
 - Tenure-track
 - 26.5% women
 - Researcher
 - 20.5% women
 - Post-doc
 - 19.5% women
 - Teaching faculty
 - 31.8% women

It Wasn't Always Like This...

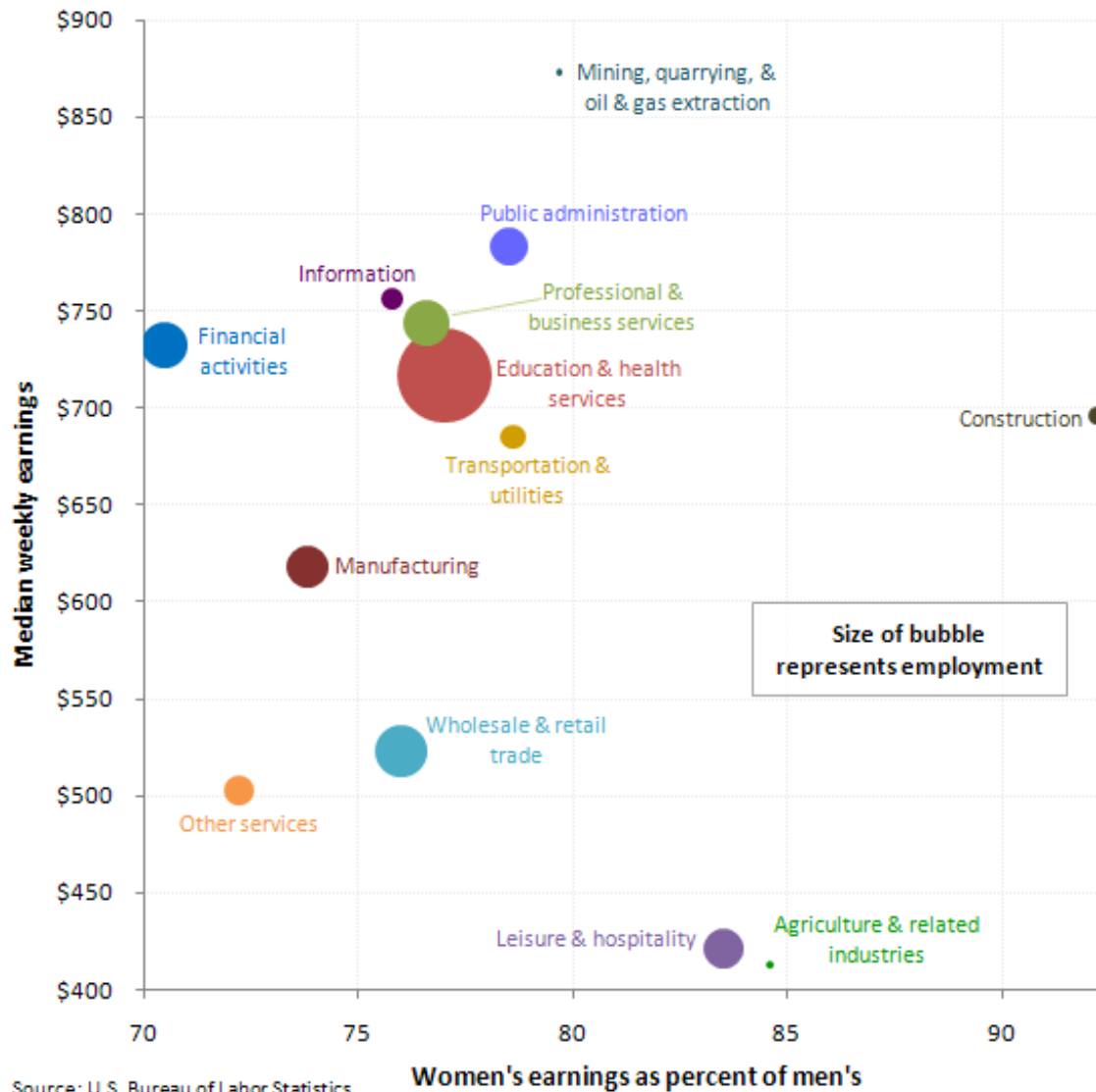
- According to the National Science Foundation (NSF), the number of computer science and engineering degrees granted to women reached 37% in 1984.
- In the 1990s, increases in enrollment and degrees were the norm.
- In the late 1990s, an attrition problem became evident.
- It was followed by severe drops in enrollment.

Why the Low Numbers in CS?

- In general
 - Perceptions about the job market
 - Lack of self confidence
 - Imposter syndrome
 - Bias in the classroom, advising
 - Lack of women faculty, mentors, heroines

On the Job

Employment and median usual weekly earnings of women, by industry, 2009



Source: U.S. Bureau of Labor Statistics

Source: [US Bureau of Labor Statistics](#)

Where Are the Jobs?

- Bureau of Labor Statistics rates the job outlook for these jobs as excellent with employment expected to grow faster or much faster than for the average job.
 - Computer and information systems managers
 - Computer network, systems, and database administrators
 - Software engineers and computer programmers
 - Computer support specialists

Some Good News!

- Record number of women declare CS major at Harvard
- 25% of CS students are women
- Rise corresponds with increase in female enrollment in the CS introductory course, Computer Science 50: “Introduction to Computer Science I.”
- Source: <http://tinyurl.com/4ychhr4>

My Story



Resources

- Computer Research Association's
 - [Committee on the Status of Women in Computing Research](#)
- AAUW
 - [Why So Few? \(STEM research\)](#)
- [Anita Borg Institute for Women and Technology](#)
- [National Center for Women & Information Technology](#)
- [COMPUGIRLS](#)

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