DIVERSITY IN COMPUTING

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Diversity in Computing - Outline

- Why should we care?
- What is the problem/status of the problem?
- Why is there a lack of diversity in computing?
- What can we do about it?
Diversity in Computing: Why should we care?

It's where the good jobs are
Jobs are Plenty; Jobs are Satisfying

**Best Jobs in America Reports* 2019**

<table>
<thead>
<tr>
<th>Platform</th>
<th>Top Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US News</strong></td>
<td>2 of top 15 (including #1 and #2)</td>
</tr>
<tr>
<td><strong>LinkedIn</strong></td>
<td>5 of top 10 (including #1 and #2)</td>
</tr>
<tr>
<td><strong>Glassdoor</strong></td>
<td>4 of top 10 (including #1)</td>
</tr>
<tr>
<td><strong>Indeed</strong></td>
<td>3 of top 10 (including #1 and #3)</td>
</tr>
</tbody>
</table>

*Based on job satisfaction, stability, and salary
Jobs are Well Paid: Associate’s Degrees

Associate’s Degrees by Median Salary

- Management Information Systems
- Electronics & Communications Engineering
- Dental Hygiene
- Computer Science
- Networks & Telecommunications
- Computer Programming
- Electrical Engineering Technology
- Nursing
- Mathematics
- Information Systems
- Computer Information Systems
- Medical Laboratory Technician
- Health Information Technology
- Veterinary Technology
- Early Childhood Education

Source: PayScale College Salary Report 2015-2016
Jobs are Well Paid: Bachelor’s Degrees

Bachelor’s Degrees by Median Salary

- Petroleum Engineering
- Computer Science
- Accounting & Computer Systems
- Computer Information Systems
- Accounting
- Computer Networking Systems
- Health Information Management
- Human Resources Management
- Communication and Journalism
- Liberal Arts
- Hospitality and Tourism
- Psychology and Sociology
- Health Administration
- Early Childhood Education

Source: PayScale College Salary Report 2015-2016
Computing Jobs Let You Work & Have a Life

Average Hours Per Week for Major Occupational Groups

- Healthcare Support
- Office and Administrative Support
- Personal Care and Service
- Life, Physical, and Social Science
- Computer and Mathematical
- Production
- Arts, Design, Entertainment, Sports, and Media
- Sales and Related
- Transportation and Material Moving
- Farm, Fishing, and Forestry
- Management

Average hours range from 37 to 45 hours per week.
But computing has a problem.
It attracts too few people.
BLS Projected 2022 employment: Jobs requiring degree

- Medical & health services...
- Medical & clinical laboratory technologists
- Mechanical engineers
- Market research analysts & marketing specialists
- Logisticians
- Industrial engineers
- Human resources specialists
- Healthcare practitioners...
- Graphic designers
- Graduate teaching assistants
- Financial analysts
- Environmental scientists & specialists, including...
- Engineers, all other
- Electronics engineers, except computer
- Electrical engineers
- Cost estimators
- Computer hardware engineers
- Civil engineers
- Child, family, & school social workers
- Chemical engineers
- Aerospace engineers
- Biological technicians
- Chemists
- Meeting, convention, & event planners
- Mental health & substance abuse...
- Personal financial advisors
- Public relations specialists
- CS
- Computing Occupations 27%

Accountants and auditors
2015 Intended Major (national sample)

- **Biological and Life Sciences**, 14.9%
- **Business**, 13.2%
- **Engineering**, 13.1%
- **Health Professions**, 11.3%
- **Arts and Humanities**, 10.1%
- **Social Sciences**, 10.8%
- **Undecided**, 8.9%
- **Other Majors**, 4.9%
- **Education**, 4.2%
- **Computer Science**, 3.8%
- **Math and Other CS**, 1.6%
- **Physical Science**, 2.6%
- **Business**, 13.2%
- **Engineering**, 13.1%
- **Health Professions**, 11.3%
- **Arts and Humanities**, 10.1%
- **Social Sciences**, 10.8%
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Let’s compare...
Demand and low production explains the CS initiatives

- 2016: White House introduces the “Computer Science for All” initiative

- CS/computational thinking curricula compulsory in:
  - primary and middle schools in San Francisco
  - primary schools in New York City
  - K-8 in Virginia
  - for high school graduation in Chicago

- High schools in Arkansas, Texas, and New York City now must offer a CS course
But computing has a problem. It attracts only a narrow range of people.
Women’s Presence in STEM Disciplines Varies

### Percent of BS Awarded to Women in the U.S. 2014

- Biology: 59%
- Chemistry: 48%
- Mathematics & Statistics: 42%
- Biomedical Engineering: 40%
- Geology: 40%
- Chemical Engineering: 34%
- Management Information Systems: 26%
- Civil Engineering: 22%
- Physics: 19%
- Computer & Information Sciences: 17%
- Computer Science: 15%
- Mechanical Engineering: 13%
- Electrical Engineering: 12%
- Computer Engineering: 10%

### Total Degrees Awarded to Men and Women 2014

- Biology
- Computer & Information Sciences
- Mechanical Engineering
- Mathematics & Statistics
- Chemistry
- Electrical Engineering
- Computer Science
- Civil Engineering
- Management Information Systems
- Chemical Engineering
- Physics
- Geology

Women Earning Computer Science Degrees

Percent of Computer Science Degrees Earned By Women 1990-2016

Source: NCWIT
Women Earning Computing & Information Systems (CIS) Degrees

Percent of CIS Degrees Earned By Women  1998-2017

Source: NCWIT
Racial Composition of CIS Associate Degrees

### Racial Composition of Women's CIS Associate Degrees 2017

- **American Indian/Alaska Native**: 1%
- **Asian**: 0.15%
- **African American/Black**: 9%
- **Hispanic/Latino**: 14%
- **White**: 53%
- **Hawaiian/Pacific Islander**: 0.34%
- **Two or More Races**: 12%
- **Unknown**: 4%
- **Non-Resident**: 4%

### Racial Composition of Men's CIS Associate Degrees 2017

- **American Indian/Alaska Native**: 0.34%
- **Asian**: 4%
- **African American/Black**: 7%
- **Hispanic/Latino**: 13%
- **White**: 60%
- **Hawaiian/Pacific Islander**: 10%
- **Two or More Races**: 3%
- **Unknown**: 2%
- **Non-Resident**: 1%

Source: NCWIT
Diversity in Computing

So, why should that matter?

Why does it matter to you?
The Value of Diversity to Computer Science

- Enhances innovation
- Expands the qualified employee pool
- Improves the bottom line
- Promotes equality/inclusion
- Reflects user/consumer base
- Global competitiveness

ncwit.org/businesscase
Why is there a lack of diversity in computing?

• Lack of knowledge of what computing is
• Misconceptions about what people in computing jobs do
• Stereotypes about who you “need to be” to do well in computing
What can we do about it?

• Actively recruit for diversity
• Utilize research based, best-practice retention strategies that will engage your students and sustain their interest
• Create an environment that fosters interest, confidence, learning, sense of belonging, and occupational identity
• Some examples of what we’ll talk about in this workshop:
  • Inclusive pedagogy
  • Stereotype threat and how to avoid it
  • Case study on implementing workshop strategies
Questions?
Diversity in Computing: Activity

• Head to Resources Section of LH4CS.org/dulles and choose:
  • Explore computing education and workforce data in your area:
  • https://forms.gle/2GZYqc6Bp2hC6Wpo9
Thank You!
What’s next?

- Core Sessions:
  - Active Recruiting
  - Stereotype Threat & Inoculation
  - Inclusive Pedagogy
  - Chrestomathics
- Integration Sessions
- Evaluation
Sources Used


Sources Used
