Getting more females in tech careers

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Why it matters

• Demand
• Access to great jobs
• Better solutions to the world’s problems
Change is needed at all levels

• Increase the % female majors in CS and engineering
• Increase the hiring and retention of females in the tech industry
• Increase the hiring and retention of females in academia
• Increase promotion of women into highest levels of leadership in industry and academia
Hypothesis

If we
• make learning and work environments interesting and supportive,
• build confidence and community among women
• and demystify success
women will come, thrive and stay
Things we can do

• Provide fun and interesting CS and engineering courses in middle and high school
• Change the way we teach CS and engineering at the college level
• Learn how to recruit and retain more female faculty
• Learn how to recruit and retain more females in the tech industry
• Create and support networking and mentoring opportunities for females at all levels
• Increase the visibility of the issues
• Lean forward in our own careers
Did you know?

• CS is the only STEM discipline where female % of majors has declined in last 30 years (from > 30% to < 15%)
• 45% of math majors are female
• CS graduates have the best job prospects for the next two decades
• Successful institutions for female CS majors
  – CMU from 8% to 38%
  – UBC from 16% to 27%
  – MIT from 20% to 32%
  – HMC from 10% to 40%
  – Cal Poly SLO from 12% to 29%
  – UW from 15% to 30%
CRA-W programs

- DMP for undergrad CS women
- Ph.D. cohorts
- Workshops for early academic success
- Workshops for getting tenure
- Workshops for promotion to full professor
Female Taulbee Data 2008 - 2013

<table>
<thead>
<tr>
<th>year</th>
<th>B.Sc</th>
<th>Ph.D.</th>
<th>New faculty</th>
<th>assistant</th>
<th>associate</th>
<th>full</th>
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<tr>
<td>2002</td>
<td>18.8%</td>
<td>17.8%</td>
<td>17.3%</td>
<td>15.4%</td>
<td>13.1%</td>
<td>7.7%</td>
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<td>2008</td>
<td>12.2%</td>
<td>19.3%</td>
<td>23.9%</td>
<td>19.6%</td>
<td>13.4%</td>
<td>10.9%</td>
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<tr>
<td>2009</td>
<td>11.3%</td>
<td>20.8%</td>
<td>23.1%</td>
<td>24.3%</td>
<td>15.9%</td>
<td>12.3%</td>
</tr>
<tr>
<td>2010</td>
<td>13.8%</td>
<td>18.8%</td>
<td>26.5%</td>
<td>25.6%</td>
<td>15.9%</td>
<td>12.6%</td>
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<tr>
<td>2011</td>
<td>11.7%</td>
<td>18.4%</td>
<td>21.3%</td>
<td>25.3%</td>
<td>17.9%</td>
<td>12.7%</td>
</tr>
<tr>
<td>2012</td>
<td>12.9%</td>
<td>17.8%</td>
<td>22.4%</td>
<td>26%</td>
<td>19.5%</td>
<td>13.5%</td>
</tr>
<tr>
<td>2013</td>
<td>14.2%</td>
<td>17.2%</td>
<td>22.5%</td>
<td>26.6%</td>
<td>20%</td>
<td>13.7%</td>
</tr>
</tbody>
</table>
Getting from 10% to 40% at HMC

• Female students at HMC over all:
  – 22% in 1997
  – 32% in 2006
  – 42% in 2010
  – 45% in 2012
  – 47% in 2014

• Female faculty at HMC over all:
  – About 20% in 1997
  – 33% in 2006
  – 40% in 2010
What the CS department did...

- Changed the intro course
- Eliminated student macho behavior
- Took first year females to Hopper
- Provided summer research experiences between first and second year
Changing the intro course

• Old course: learning to program in Java
• New course: computational approaches to creative problem-solving using Python
• Grouping by prior experience
  – CS 5 gold, CS 5 black, CS 42
  – Elimination of macho behavior for CS 5 and CS 60
• Outcomes: everyone loves it, more majors, more non-majors in higher level CS classes
Sharing best practices

• BRAID project
• Scratch course (Colleen Lewis) on EdX
• CS 5 MOOC for profs available fall 2015
• Infusing computational tech into other disciplines
BRAID

• Building Recruiting and Inclusion for Diversity
• Collaboration by HMC, ABI, NCWIT, CRA, CMDIT
• 15 CS departments (plus beacons and affiliates)
• Funded by Facebook, Google, Intel, Microsoft and NSF
• UCLA research team studying outcomes
Strategies for recruiting and retaining female faculty

• Educate search committees on best practices for recruiting a diverse pool of candidates, and landing a diverse candidate
• Spousal hiring programs
• Maternity leaves
• Parent-friendly department cultures
• Access to good child-care
• Provide back-up care (BrightHorizons.com)
How to retain more females in tech careers in industry

- Anita Borg Institute study (anitaborg.org)
- Annual Hopper conference in October
- Commitment from companies to change the culture
Increase the visibility

• Ask why there are so few females
  – Faculty
  – Keynote speakers
  – Summer interns
  – Board members

• Talk about the importance of having women in tech
Discussion