Opportunities in
Computer Science

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The Benefits of a Diverse Education

• You don’t need to be a Pulitzer Prize winning novelist to appreciate an English class…

• …nor a world-renowned scientist or mathematician to understand the wonders of our world.

• We believe that understanding computational thinking also offers skills useful for your future.
Software is Everywhere

• Think of some of the things that entertain and enrich your daily life

• All of the above are driven by software

• Software developers equipped with a computer science degree have opportunities to work on exciting and cutting-edge projects
Software is Everywhere

• 98% of all microprocessors control devices other than desktop computers
  – Automobiles, airplanes, televisions, copiers, razors…

• These devices also need software and often require strong technical skills to develop
February 15, 2005: Domain registered (youtube.com)
Jawed Karim, Chad Hurley, and Steve Chen
Around 25 years old at this time

December 2005: Official Debut

October 2006: Time Magazine Invention of the Year

3 Billion Clips viewed daily
Average viewer spends 15 minutes per day
48 hours of video uploaded each minute

October 6, 2006: Google purchased for $1.65B
Alabama Technology Leaders

Wikipedia

- The biggest multilingual free-content encyclopedia on the Internet.
- Since its creation in 2001, nearly 24 million articles in over 250 languages.
- 18M views per day in English; 14M active contributors.

Jimmy Wales
Wikipedia Founder
Huntsville Native
"... the software industry is going to make more breakthroughs in these next 10 years than it's made in the last 30 ... software is really going to transform not just what we think about as the computer industry, but the way that everything is done ..."
Offshore hysteria: Many companies with high paying jobs within the US are unable to fill positions with computer scientists.

Money Magazine
Best Jobs in America 2009

Best Jobs in America

1. Systems Engineer
   Information Technology (38,000)
   $87,100 | $130,000

2. Physician Assistant
   Healthcare (93,000)
   $90,000 | $124,000

3. College Professor
   Education (79,000)
   $70,400 | $115,000

4. Nurse Practitioner
   Healthcare (110,000)
   $65,200 | $113,000

5. IT Project Manager
   Information Technology (39,000)
   $96,700 | $140,000

6. Certified Public Accountant
   Finance (60,000)
   $74,200 | $138,000

7. Physical Therapist
   Healthcare (98,000)
   $74,800 | $152,000

   Information Technology (21,000)
   $99,700 | $152,000

9. Intelligence Analyst
   Government (21,000)
   $85,200 | $115,000

10. Software Product Manager
    Information Technology (17,000)
    $106,000 | $148,000

11. Business Analyst, IT
    Information Technology (12,000)
    $82,600 | $119,000

12. Attorney/Lawyer
    Legal (9,000)
    $78,000 | $122,000

13. Telecommunications Network Engineer
    Information Technology (8,000)
    $86,200 | $130,000

14. Securities Trader
    Financial (20,000)
    $79,300 | $124,000

15. Education/Training Consultant
    Financial (20,000)
    $77,800 | $157,000

16. Emergency Room Physician
    Healthcare (9,000)
    $249,000 | $386,000

17. Product Management Director
    Sales and Marketing (9,000)
    $146,000 | $204,000

Key
- Selected interest areas
- Highest paid Salary
- Highest median Salary
- Most flexibility
- Most job satisfaction
- Most benefit to society
- Highest employment growth
- Highest job growth
- Most dangerous
- Most secure
- Most career growth
The Demand for Computer Scientists

Computer Science occupations are projected to grow twice as fast as the average for all occupations.

Between 2008-2018 a projected 822,000 new jobs will be available in Computer Science occupation areas in the United States alone.

The Demand for Computer Scientists

Percentage Of New STEM Jobs By Area Through 2018

- Computing: 71%
- Traditional Engineering: 16%
- Mathematics: 2%
- Life Sciences: 4%
- Physical Sciences: 7%
- Computer Networking: 21%
- Software Engineering: 27%
- Computer Support: 7%
- Database Admin.: 2%
- Systems Analysis: 10%
- Other Computing: 3%
- CS/IS Research: 1%

Annual STEM Job Openings vs College Graduates Through 2018

The Demand for Computer Scientists

According to the Bureau of Labor and Statistics, 5 of the top-10 growing jobs have a computer science focus.

(Reprinted with Permission from onInvesting)

### The Top 10 Jobs of Tomorrow

The current occupational outlook identifies healthcare and computer technology as the fastest growing fields needed to meet the needs and interests of our aging population. The following 10 occupations, requiring a bachelor’s degree, are expected to grow the most through 2014, according to the December 2005 BLS report.

<table>
<thead>
<tr>
<th>Title</th>
<th>Expected Growth Rate</th>
<th>Median Salary (2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network systems and data communications analyst</td>
<td>55%</td>
<td>$60,600</td>
</tr>
<tr>
<td>Physician’s assistant</td>
<td>50%</td>
<td>$69,410</td>
</tr>
<tr>
<td>Computer applications software engineer</td>
<td>48%</td>
<td>$79,930</td>
</tr>
<tr>
<td>Computer systems software engineer</td>
<td>43%</td>
<td>$79,740</td>
</tr>
<tr>
<td>Network and computer systems administrator</td>
<td>38%</td>
<td>$58,190</td>
</tr>
<tr>
<td>Database administrator</td>
<td>38%</td>
<td>$60,650</td>
</tr>
<tr>
<td>Physical therapist</td>
<td>37%</td>
<td>$60,180</td>
</tr>
<tr>
<td>Medical scientist</td>
<td>34%</td>
<td>$61,320</td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>34%</td>
<td>$54,660</td>
</tr>
<tr>
<td>College instructor</td>
<td>32%</td>
<td>$51,800</td>
</tr>
</tbody>
</table>
The Demand for Computer Scientists

• National Job Outlook
  – According to the National Association of Colleges and Employers (NACE)
    • $63,402 is the average starting salary for computer science degrees in the class of 2011 (among highest starting salaries); 3.7% increase over 2010 offers
    • Computer Science tops list of best major for jobs with the highest number of job offers per major
Computer science has the highest engineering salary and the fastest growing salary increase.

Source: IEEE Spectrum, August 2008
The Potential for Alabama

• Per capita, Huntsville is one of the top five cities in the US with concentration of software developers, and #1 in terms of total engineers.

• Cummings Research Park is the second largest in the United States and the fourth largest in the World.
The Potential for Alabama

- Comparison of Projected Computing Jobs & Computer Science Degrees Earned

Projected Average Annual Number of Computing Job Openings: 1870
Projected 10-year Percent Change in Computing Jobs: 28.30%
Projected 10-year Change in Number of Computing Jobs: 10370

http://www.ncwit.org/ caucus.php?id=AL&d=0
Myth of Computer Science

• According to the Alabama Learning Exchange (ALEX)\(^1\), computing is equated to learning Microsoft Word and various mechanical tasks; this is not Computer Science!

\(^1\) http://alex.state.al.us/standardAll.php?grade=9&subject=TC2&summary=2
## Computer Science in Alabama

- Number of schools passing AP CS audit

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Less than 8 (out of &gt; 460)</td>
</tr>
<tr>
<td>Tennessee</td>
<td>16</td>
</tr>
<tr>
<td>South Carolina</td>
<td>18</td>
</tr>
<tr>
<td>North Carolina</td>
<td>28</td>
</tr>
<tr>
<td>Florida</td>
<td>69</td>
</tr>
<tr>
<td>Georgia</td>
<td>78</td>
</tr>
<tr>
<td>New Jersey</td>
<td>133</td>
</tr>
<tr>
<td>California</td>
<td>165</td>
</tr>
<tr>
<td>Texas</td>
<td>271</td>
</tr>
</tbody>
</table>
Comparison with Neighbors to the East

- Number of students taking AP CS exams

<table>
<thead>
<tr>
<th>State</th>
<th>2001</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>69 CS A</td>
<td>422 CS A</td>
<td>585 CS A</td>
<td>583 CS A</td>
<td>692 CS A</td>
</tr>
<tr>
<td></td>
<td>15 CS AB</td>
<td>107 CS AB</td>
<td>105 CS AB</td>
<td>160 CS AB</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>22 CS A</td>
<td>27 CS A</td>
<td>41 CS A</td>
<td>24 CS A</td>
<td>51 CS A</td>
</tr>
<tr>
<td></td>
<td>12 CS AB</td>
<td>7 CS AB</td>
<td>11 CS AB</td>
<td>22 CS AB</td>
<td></td>
</tr>
</tbody>
</table>

- Alabama population, ages 15-18: 220k
- Over 3700 students took AP US History
- Nearly 120 took the AP Latin exam
High School Outreach at UA CS

Mentoring for Science Fair Competitions

• Mentoring throughout academic year; students treated like a PhD student with office space
• In 2010, three students named ISEF finalists

Summer Camps

• Summer 2011: Java, robots, Android!
• Summer 2011: Teacher workshops
• Summer 2012: Middle school camps
• Taught by UA Faculty

Field Trips and School Visits

• 3-hour field trips to UA CS Department (pizza lunch!)
• Visits to your school; robotics and game programming talks

Alabama Robotics Contest

• 3-hour field trips contest; solve 3 challenge problems
• Open to all grades in K-12; statewide
• Open platform
• Focus on programming
UA Factoids

- Founded in 1831, The University of Alabama is the state’s first university
- UA is ranked among the top 50 public universities in the nation for the ninth consecutive year in U.S. News and World Report’s annual college rankings, fall 2010.
- Ranked 10th in the nation for enrollment of National Merit Scholars (incoming Freshmen)
- UA led the nation with a record 10 students named to USA Today’s 2010 All-USA College Academic Team. UA has had great success in placing students on this national team that honors the “best of the best” undergraduate academic all-stars from across the nation, having placed 46 students on the team since 2003. In addition to 2010, UA also had the most students on the list in 2003, 2005, 2006, 2008 and 2009 and tied for #1 in 2007.
Summer 2013
All buildings complete
Science and Engineering Complex