

Random Bytes

Computer Science Department
College of Basic and Applied Sciences
Middle Tennessee State University

THE FUTURE OF COMPUTER SCIENCE

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Computer Science is more than pressing buttons on a game program or filling in a spreadsheet. Computer Science involves the study of the hardware and software that brings you the latest entertainment, communications, business, and medical applications, and many of the other services that place the marvels of modern life at your finger tips.

We have reached a point in our society where almost everything you interact with is controlled by some form of computer, even if it isn't readily visible. There are computers in your car, phone, mp3 player, TV, appliances, and maybe on your desk. They can even go with you on your belt or in your backpack. And with wireless communications abounding, the wonders of the Internet are available almost everywhere. The potential is exciting and challenging, limited only by our imagination.

Computer Science students learn what makes these products and applications work and how to design and implement their own!

What does someone with a Computer Science degree do?

There are endless opportunities for those who complete a Computer Science degree. Challenging opportunities exist in engineering, science, business, and entertainment industries. The most common choice following graduation is to begin a professional career working for a company or public sector organization performing software development. Yet, some graduates prefer to work in positions that don't involve as much software development including, technical marketing, system administration, web site development and support, network administration, or database administration. Other graduates elect to pursue further studies at the Masters or PhD levels.

Many people think that a person with a Computer Science degree will be working endless hours, alone in a cubicle, writing line after line of code. This vision has been popularized by the Dilbert cartoon series; however, it is largely inaccurate. A professional software developer will spend considerable time working with other developers, managers, engineers, marketers and maybe even customers to develop an effective solution to a computing problem or opportunity. Software development is definitely a team activity, and often it ends up being an interdisciplinary effort.

| Inside this issue: | |
|---|---|
| The Future of Computer Science | 1 |
| The Future of Computer Science (continued) | 2 |
| Fastest Percentage Growth in Jobs Through 2010 | 2 |
| CS Faculty Review | 3 |
| CS Faculty Review (continued) | 4 |
| Top 10 Things You May Not Be Able to Live Without | 4 |
| ACM Bulletin | 5 |
| Student Research Awards | 5 |
| Computer Science 2008 Award Winners | 5 |
| CS Salaries by Job, Experience and City | 6 |

THE FUTURE OF COMPUTER SCIENCE (CONTINUED)

For more information about a Computer Science career and the opportunities it presents, visit the [Bureau of Labor Statistics](#) web site.

Where can you go with a Computer Science degree?

With a degree in Computer Science you understand how software is designed, developed, and delivered. Computer Science is a practical degree with a hands-on focus. When you are done, you have a degree in a field that is expected to grow by nearly 40% from 2007 to 2012, compared with only 15% predicted growth for all occupations combined.

With about 20% of all venture capital spent in 2006 spent on software, it is one of the fastest growing areas of the economy and promises to continue at this pace well into this century. As a result, Computer Science degrees are still one of the highest paid degrees in science and engineering. Starting salaries often fall in the range from \$60,000 to \$80,000.

Hot spots for computer science are on both coasts and in mid-country places like Colorado. You may also be surprised to find out that a lot of software development is done in small companies located in small and out of the way places. Internet services make working from almost any location in the world feasible.

If you've been worried that Computer Science jobs are rapidly leaving this country and



going over seas, you shouldn't be. It is true that countries in Eastern Europe and Asia are



developing skilled work forces to perform software development and some routine software development work has moved there. However, the really challenging and creative jobs are largely remaining in our country. With many of our leading software development firms now having a global focus and new market opportunities, for those who are interested, great opportunities are available to work collaboratively with people in other countries and to travel internationally.

The information from this article was provided through the University of Idaho.

Fastest Percentage Growth in Jobs Through 2010

- Computer systems software engineers, from 2,080 jobs in 2000 to 3,960 jobs in 2010
- Computer support specialists, from 7,110 jobs in 2000 to 13,300 jobs in 2010
- Computer applications software engineers, from 3,300 jobs in 2000 to 6,140 jobs in 2010
- Ship engineers, from 280 jobs in 2000 to 520 jobs in 2010
- Travel agents, from 1,410 jobs in 2000 to 2,610 jobs in 2010

<http://frank.mtsu.edu/~csdept/Careers/BigBucks.htm>

CS FACULTY REVIEW

External Funding

Ralph Butler, Argonne National Laboratory for research on parallel processing, renewal of contract for 2008-2009. \$47,000

Al Cripps, CyberQuest funding for 2008-2009 from Franklin Special School District (Franklin, city in Williamson County) and Franklin Road Academy (Nashville). \$5,500

Richard Detmer, Principal Investigator (PI), Cen Li (CoPI) and Zhijiang Dong (CoPI), "CISE Pathways to Revitalized Undergraduate Computing Education (CPATH) Conceptual Development and Planning (CDP) ProjectMT -- A Real-World-Project-Based Computer Science Curriculum." August 2008-July 2010. \$149,777 National Science Foundation (NSF) CPATH grant plus \$25,000 supplemental grant for year one.

Cen Li (PI), Tom Cheatham (CoPI), Zhijiang Dong (CoPI) and Roland Untch (CoPI), "Course, Curriculum, and Laboratory Improvement (CCLI): Promoting Peer Collaboration Through PeerSpace -- A Novel Online Social Network Based Learning Environment," NSF CCLI grant. \$149,745

Existing Funding

Jungsoon Yoo (PI), Chrisila Pettey (CoPI), Suk Jai Seo (CoPI), and Sung Yoo (CoPI), "Intelligent Algorithm Development Tutor." NSF CCLI proposal. January 2008-December 2010. \$149,888

Pending Funding

Tom Cheatham (PI), Cen Li (CoPI), Zhijiang Dong (CoPI), Brenda Parker (CoPI), Judy Hankins (CoPI), "NSF-Broadening Participation in Computing (BPC): IMPACT: Increasing Minority Participation to Accelerate Computing in Tennessee." Submitted May 2009. \$500,000

Tom Cheatham (PI), Co-PIs: Cen Li, (CoPI) Zhijiang Dong (CoPI), David Welch (CoPI), Jian Fu (CoPI), NSF Partnerships for Innovation (PFI): PIIT: Partners for Innovation in Information Technology. Submitted December 2008. \$599,075

Medha Sarkar and Dr. James Williams (History), "Digital Democracy: Creating a Computer Simulation of Tennessee State Government," National Endowment for the Humanities. Submitted April 8, 2009. Duration: September 2009 to August 2010. \$31,015

Internal Funding

Internal matching funds for the NSF CCLI grant. Office of Sponsored Research. Spring 2009-Spring 2012. \$320,609

Internal matching funds for the NSF CPATH grant. Graduate Studies, MTSU. **Cen Li and Zhijiang Dong** Spring 2009-Spring 2010. \$15,000

Brenda Parker. "Using Alice to Stimulate Learning in Math, Science and Technology," Public Service Award to offer a summer workshop for middle school teachers. \$1,000

Medha Sarkar. "Digital Democracy: Creating an Online Democracy Educa-

tion Simulation," Faculty Research and Creative Activity Committee (FRCAC) MTSU. April 28, 2009 for 2009-2010. \$14,800

Jungsoon Yoo. Graduate Faculty travel grant. \$500

Sung Yoo. Graduate Faculty travel grant. \$500

Publications and Presentations

Ralph Butler and Chrisila Pettey, "An Open Source Tool for Teaching Concepts for Building Distributed Isometric 3D Games," *The Journal of Computing Sciences in Colleges*, Volume 24, Number 2, December 2008.

Ralph Butler, Chrisila Pettey, and Melissa Miller (CS graduate student), "PyXM: A Framework for Exploring the Use of Software Transactional Memory for Concurrency Control in Python Programs." Intellectbase International Consortium Academic Conference, Nashville, TN, May 2009.

Richard Detmer, "Assembly Language with Visual Studio," Association for Computing Machinery (ACM) Mid-Southeast Fall 2008 Conference, Gatlinburg, Tennessee, November 21, 2008.

Richard Detmer, *Introduction to 80x86 Assembly Language and Computer Architecture* (second edition), Jones and Bartlett © 2010, 386 pages.

Y. Fu, **Zhijiang Dong**, J. Ding and X. He, "Mapping Software Architecture Specification to Rewriting Logic." *Journal of the 8th International Conference on Quality Software*. Oxford, United Kingdom, August 12-13, 2008.

CS FACULTY REVIEW (CONTINUED)

Cen Li, Zhijiang Dong and Richard Detmer, "NSF CPATH Grant: A Real World Project Based Computer Science Curriculum." Nashville Technology Council (NTC) Innovation Technology Conference, March 12, 2009.

Cen Li, B. Bodkin, and J. Lancaster (CS undergraduate students), "Programming Khepera II Robot for Autonomous Navigation and Exploration using the Hybrid Architecture," ACM Southeast Conference, Clemson University, Clemson, South Carolina, March 19-21, 2009.

Cen Li, Zhijiang Dong and Roland Untch, "Promote Peer Learning in a Social Network Environment - A Preliminary Study," Instructional Technology Conference, MTSU, March 30, 2009.

Cen Li, Zhijiang Dong, and Roland Untch, "Promote Peer Learning in a Social Network Environment – A Preliminary Study." Poster presentation, Scholars Day, MTSU, April 3, 2009.

J. Leblond, A.D. Lasiter, **Cen Li**, R. Logares, K. Rengefors, and T.J. Evens, "Applying Clustering and Phylogeny Analysis to Study Dinoflagellates based on Sterol Composition," IEEE International Conference in Bioinformatics and Biomedicine. pp. 90-97, Philadelphia, Pennsylvania, November 3-5, 2008.

C. Gray, A. Lasiter, **Cen Li**, J. Leblond, "Mono- and Digalactosyldiacylglycerol Composition of Dinoflagellates. I. Peridinin-Containing Taxa," *European Journal of Phycology*, February 2009

Brenda Parker, "Using Alice to Create Animations and to Introduce Programming." Instructional Technology Conference, MTSU, April 2009.

Brenda Parker, "Conducting an Alice Workshop." ACM Mid-Southeast Fall 2008 Conference, Gatlinburg, Tennessee, November 21, 2008.

Chrisila Pettey, "An Open Source Tool for Teaching Concepts for Building Distributed Isometric 3D Games." Twenty-second Annual CCSC South-eastern Conference, November 2008.

Chrisila Pettey, Suk Jai Seo, Jungsoon Yoo, Sung Yoo, and Zhijiang Dong, "A Tool for Promoting Algorithm Development in Introductory CS Classes." *Journal of ED-MEDIA - World Conference on Educational Multimedia, Hypermedia & Telecommunications*. Honolulu, Hawaii. June 22-26, 2009.

Medha Sarkar, "Combining XML and TXL for Software Visualization: Work in Progress." ACM Mid-Southeast Fall 2008 Conference, Gatlinburg, Tennessee, November 21, 2008.

Suk Jai Seo, "The open neighborhood locating-dominating set problem." American Mathematical Society, University of Alabama in Huntsville. October 24-26, 2008.

Suk Jai Seo, "Colored and Proper-Colored-Domination," *Bulletin of the Institute of Combinatorics and its Applications*, volume 55, pp 33-45, January 2009.

Suk Jai Seo, "Competition Independence Number of Special Classes of Graphs." Florida Atlantic University in Boca Raton, Florida, March 2-6, 2009.

Roland Untch, "On reduced neighborhood mutation analysis using a single mutagenic operator." 47th Annual ACM Southeast Conference, Clemson, South Carolina. March 21, 2009.

Roland Untch, "21st Century Video-conferencing." Instructional Technology Conference, MTSU. March 30, 2009.

Jungsoon Yoo, Zhijiang Dong, Sung Yoo, Suk Jai Seo, and Chrisila Pettey, "Improving Student Performance by Enforcing Algorithm Development." *Journal of ED-MEDIA - World Conference on Educational Multimedia, Hypermedia & Telecommunications*. Honolulu, Hawaii. June 22-26, 2009.

Jungsoon Yoo, "Research in Computer Science Department." Poster presentation in College of Basic and Applied Sciences (CBAS) Showcase during Scholars week.

Sung Yoo, "A Tool for Promoting Algorithm Development in Introductory CS Classes." Poster presentation in CBAS Showcase during Scholars week.

Sung Yoo, "Improving Student Performance by Enforcing Algorithm Development." Poster presentation in CBAS Showcase during Scholars week.

Top 10 Things You May Not Be Able to Live Without

- Computer
- Air Conditioning
- Telephone
- Clock
- Recorded Sound
- Microwave Oven
- Washing Machine
- Refrigerator
- Toilet
- Television

If you would like to read more about these, go to:

<http://home.howstuffworks.com/10-appliances1.htm>

ACM BULLETIN

ACM has joined with several partners from the computing community to commend the U.S. House of Representatives' passage of a resolution to raise the profile of computer science as a transforming industry that drives technology innovation and bolsters economic productivity. The resolution, H. RES. 558, designates the week of December 7 as "National Computer Science Education Week" in honor of Grace Murray Hopper, one of the outstanding pioneers in the field of

computer science, who was born on December 9, 1906.

ACM is partnering with Microsoft, Google, Inc., and Intel as well as the Computer Science Teachers Association (CSTA), the National Center for Women & Information Technology (NCWIT), and the Computing Research Association (CRA) to build awareness of computer science education as a national priority.

Citing the influence of computing technology as a significant contributor to U.S. economic output, the House resolution calls on educators and policymakers to improve computer science learning at all educational levels, and to motivate increased participation in computer science.

ACM Bulletin Service

*Today's Topic: Congress Passes Resolution to Establish Computer Science Education as a National Priority
October 22, 2009*

STUDENT RESEARCH AWARDS

Bryan Bodkin and James Lancaster, *Autonomous Navigation, Exploration, and Visualization with the Khepera Robots*. 3rd place, Undergraduate Research Competition, ACM Mid-Southeast Conference, Gatlinburg TN, November 2008. Mentored by Cen Li.

William Bridges, *Does Convenience Hinder Algorithm Development?* Undergraduate Research Award STEP-MT.

\$1,000 Mentored by Jungsoon Yoo.

Matthew Greenwell, *Analysis of Student Learning using Visualization*. Undergraduate Research Award STEP-MT. \$1,000 Mentored by Sung Yoo.

Michael McGrath, *Modeling Student Behavior for Individualized Tutoring*. Undergraduate Research, Scholarship

and Creative Activity (URSCA) grant. \$3,150 Mentored by Jungsoon Yoo.

Jean Luc Rioux, *Detecting C++ Program Errors by Monitoring Its Execution*. Undergraduate Research Council of the College of Basic and Applied Sciences. \$1,000 Mentored by Zhijiang Dong.

COMPUTER SCIENCE 2008 AWARD WINNERS

Outstanding Freshmen in Computer Science: Anthony Mills, Curtis Taylor and Christopher Waits

Outstanding Sophomore in Computer Science: Nathan Reale

Outstanding Junior in Computer Science: Sarah Bell

Outstanding Senior in Computer Science: William Bridges

Nancy Wahl Computer Science Scholarship: Angela Costabile and

Natalie Smelcer

Computer Science Alumni Award: Mark Fulton

Computer Science Scholarship Award: Wesley Adams, William Bridges and Michael Ortiz

Paul H. Hutcheson Computer Science Graduate Award: Jonathan Carrigan

Mack Thweatt Computer Science Scholarship: Vincent Gould

Richard Detmer Endowed Scholarship: Richard Ray

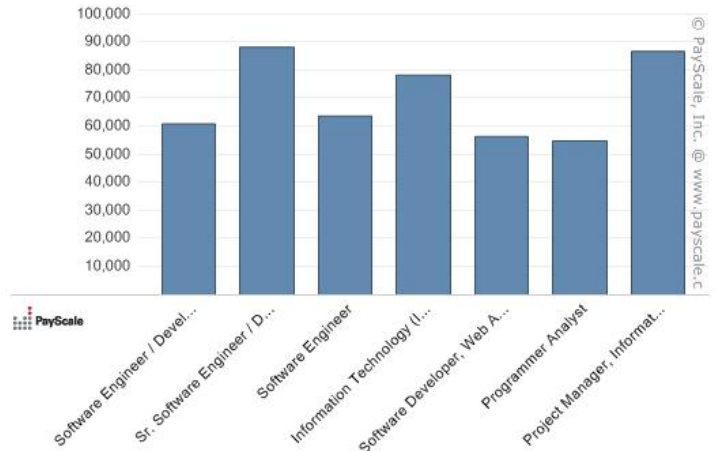




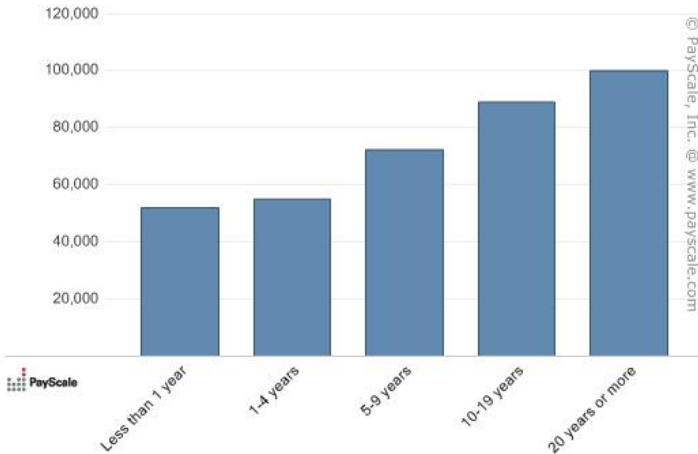
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Median Salary by Job
 Degree: Bachelor of Science (BS/BSc/SB), Computer Science (CS)
 United States - Updated October 8, 2009 - Individuals Reporting 18,935



Median Salary by Years Experience
 Degree: Bachelor of Science (BS/BSc/SB), Computer Science (CS)
 United States - Updated October 8, 2009 - Individuals Reporting 18,934



Median Salary by City
 Degree: Bachelor of Science (BS/BSc/SB), Computer Science (CS)
 United States - Updated October 8, 2009 - Individuals Reporting 18,929

