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13. SUPPLEMENTARY NOTES					
14. ABSTRACT One area in which the U.S. and DoD has a growing need for talent is in computer science. These STEM professionals play an important role in technologies, systems design, and software development. The Department of Labor has projected that in ten years, the demand for these STEM professionals will be 24 percent higher than it was in 2008. At the same time, we do not have a sufficient number of students seeking degrees in these fields, especially those that are female and are U.S. citizens. This is an important issue for DoD. We must rely on U.S. citizens for our workforce. Interventions proposed include implementing high-quality computer science education more actively at the high school level.					
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Presentation slides from the U.S. Department of Defense Science, Technology, Engineering and Mathematics (STEM) Summit October 18, 2010

Coordinated by the
DoD DDR&E STEM Development Office
703-588-1405 / STEM@osd.mil

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**Department of Defense
Defense, Research and Engineering**

Welcome to the DoD STEM Quarterly Meeting 18 October 2010

DoD DDR&E STEM Development Office (SDO) STEM Quarterly Meeting – 18 Oct. 2010 Dr. Laura Adolfe, Director, SDO



Computing Education

- Increase in computing needs in labs
- Foundation for other STEM disciplines
- Vital to complex engineering
- Digital learning technologies
- Changing teaching needs, methods and courses

DoD DDR&E STEM Development Office (SDO) STEM Quarterly Meeting – 18 Oct. 2010 Dr. Laura Adolfe, Director, SDO

Demographic Overview of Degrees Awarded in Computer Science

Lisa M. Frehill

Senior Analyst, Energetics Technology Center
Director of Research, Evaluation, and Policy, NACME

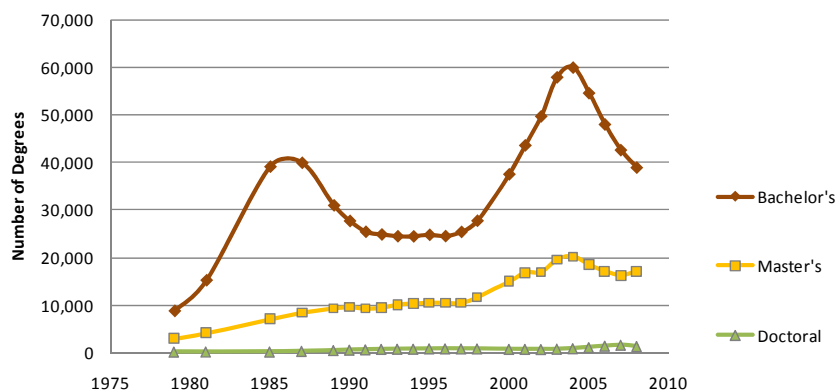
October 18, 2010

Data Notes

- IPEDS = Institutional Postsecondary Educational Data System
- Collected annually by National Center for Education Statistics for all Title V institutions (those that receive Federal funds – virtually all U.S. colleges and universities).
- WebCASPAR = database system maintained by the National Science Foundation – enables access to IPEDS data as well as a number of other data collections.
- Citizenship and Racial/Ethnic Categories:
 - U.S. = U.S. Citizens and Permanent Residents
 - Temp. Res. = Temporary Residents (a.k.a. “foreign students”)
 - URM = underrepresented minority, includes Black, Non-Hispanic; American Indian/Alaska Native; and Hispanic.
 - US non-URM = all other U.S. citizens and permanent residents NOT in the three URM categories. This includes Asian, White, and Other or Unknown race/ethnicity.

Trend in computer science degrees – steady increases at graduate levels but unevenness at undergraduate.

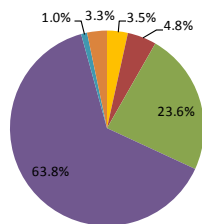
**Number of Computer Sciences Degrees by Level and Year,
Selected Years, 1979-2008**



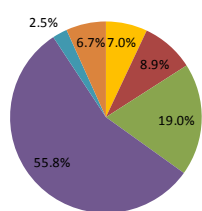
Source: Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAR database, October 8, 2010.

Bachelor's Degrees in Computer Science, 1979, 1995, 2008

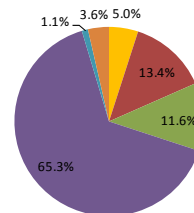
**Computer Science Bachelor's
Degrees by Sex, Citizenship and
Racial/Ethnic Category, 1979
(n = 8,769)**



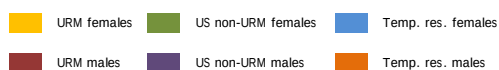
**Computer Science Bachelor's
Degrees by Sex, Citizenship and
Racial/Ethnic Category, 1995
(n = 24,769)**



**Computer Science Bachelor's
Degrees by Sex, Citizenship and
Racial/Ethnic Category, 2008
(n = 38,916)**



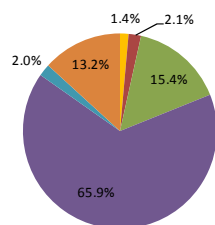
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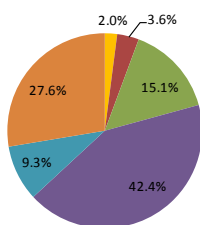
Source: Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAR database system, October 8, 2010.

Master's Degrees in Computer Science, 1979, 1995, 2008

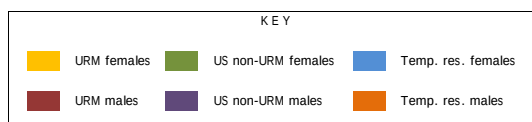
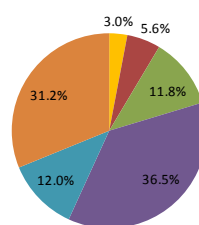
Computer Science Master's Degrees by Sex, Citizenship and Racial/Ethnic Category, 1979
(n = 3,055)



Computer Science Master's Degrees by Sex, Citizenship and Racial/Ethnic Category, 1995
(n = 10,563)



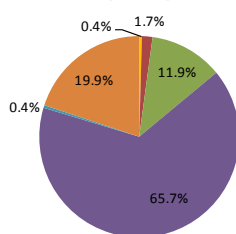
Computer Science Master's Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 17,148)



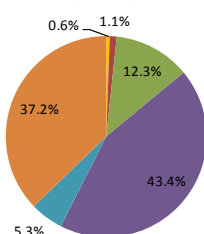
Source: Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAP database system, October 8, 2010.

Doctoral Degrees in Computer Science, 1979, 1995, 2008

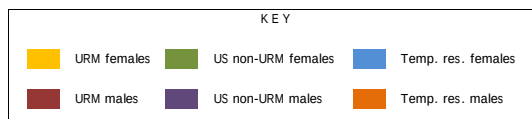
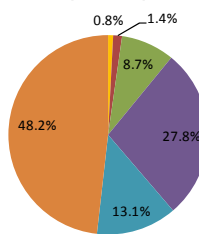
Computer Science Doctoral Degrees by Sex, Citizenship and Racial/Ethnic Category, 1979
(n = 236)



Computer Science Doctoral Degrees by Sex, Citizenship and Racial/Ethnic Category, 1995
(n = 884)



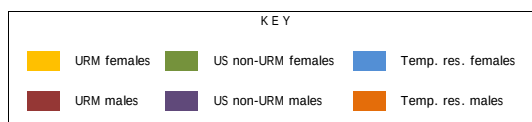
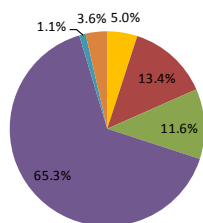
Computer Science Doctoral Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 1,338)



Source: Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAP database system, October 8, 2010.

Degrees in Computer Science by Level, 2008

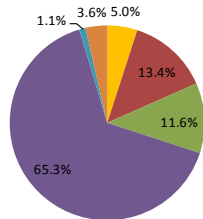
Computer Science Bachelor's Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 38,916)



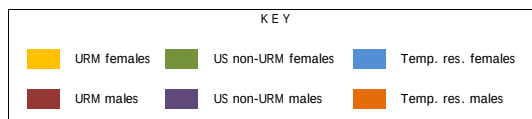
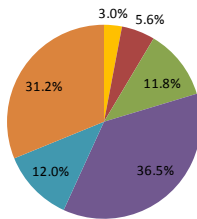
Source: *Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAR database system, October 8, 2010.*

Degrees in Computer Science by Level, 2008

Computer Science Bachelor's Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 38,916)



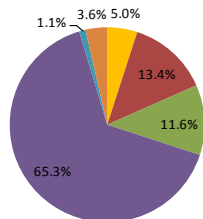
Computer Science Master's Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 17,148)



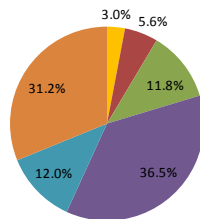
Source: *Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAR database system, October 8, 2010.*

Degrees in Computer Science by Level, 2008

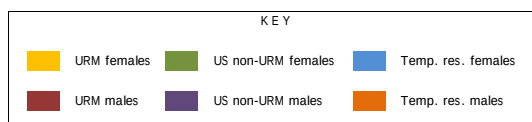
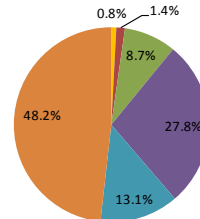
Computer Science Bachelor's Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
(n = 38,916)



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(n = 17,148)



Computer Science Doctoral Degrees by Sex, Citizenship and Racial/Ethnic Category, 2008
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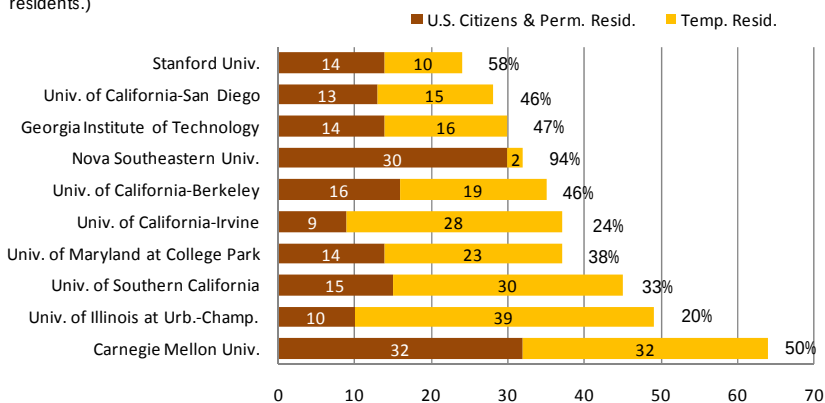


Source: Energetics analysis of IPEDS data accessed via National Science Foundation WebCASPAS database system, October 8, 2010.

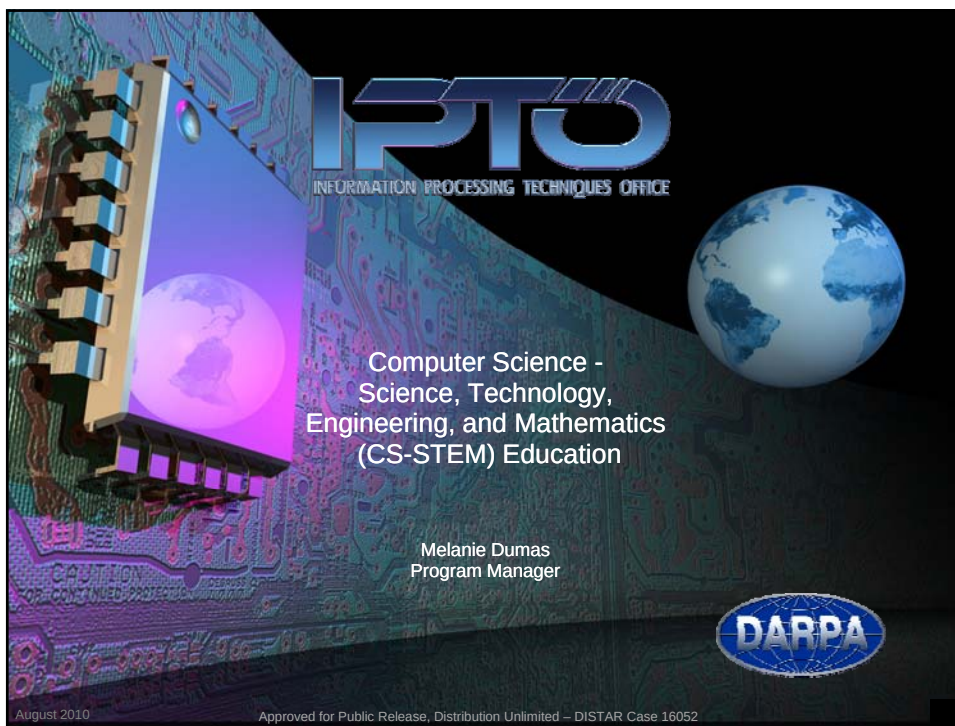
Half of the top 10 producers of computer science doctoral degrees are in California – large variation in percent of awards to U.S. citizens and permanent residents.

Number of Doctoral Degrees by Citizenship Status at Top 10 Producers of Computer Science Doctoral Degrees, 2008

(Also shown: percent of all doctoral degrees awarded to U.S. citizens and permanent residents.)



Source: Energetics Technology Center analysis of IPEDS data accessed via National Science Foundation's WebCASPAS database system, October 8, 2010.



IPTO
INFORMATION PROCESSING TECHNIQUES OFFICE

Computer Science -
Science, Technology,
Engineering, and Mathematics
(CS-STEM) Education

Melanie Dumas
Program Manager

DARPA

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DARPA The Opportunity: Lots of Jobs IPTO

Fastest growing US occupations, 2008 and projected 2018 (Bureau of Labor Statistics)
Rank ordered by number of projected new jobs over ten years (Numbers in thousands)

2008 National Employment Matrix title and code	Major occupational group	Employment 2008	Change, 2008-2018		Per cent	Median Annual wage quartile 08	Most significant source of postsecondary education or training
			2018	Number			
Home health aides	Service	921.7	1382.6	460.9	50.0	Very Low	Short-term on-the-job training
Personal and home care aides	Service Mgmt, business	817.2	1,193.0	375.8	46	Very Low	Short-term on-the-job training
Computer software engineers, applications	Professional and related	514.8	689.9	175.1	34.0	Very High	Bachelor's degree
Medical assistants	Service	483.6	647.5	163.9	33.9	Low	Moderate-term on-the-job training
Network systems, data comm. analysts	Professional and related	292	447.8	155.8	53.3	Very High	Bachelor's degree
Computer software (SW) engineers, systems SW	Professional and related	394.8	515	120.2	30.4	Very High	Bachelor's degree
Total		5432.1	6893.8	1451.7			
CS/CE related		1201.6	1652.7	451.1	38%		
CS/CE % of total		22%		24%	31%		

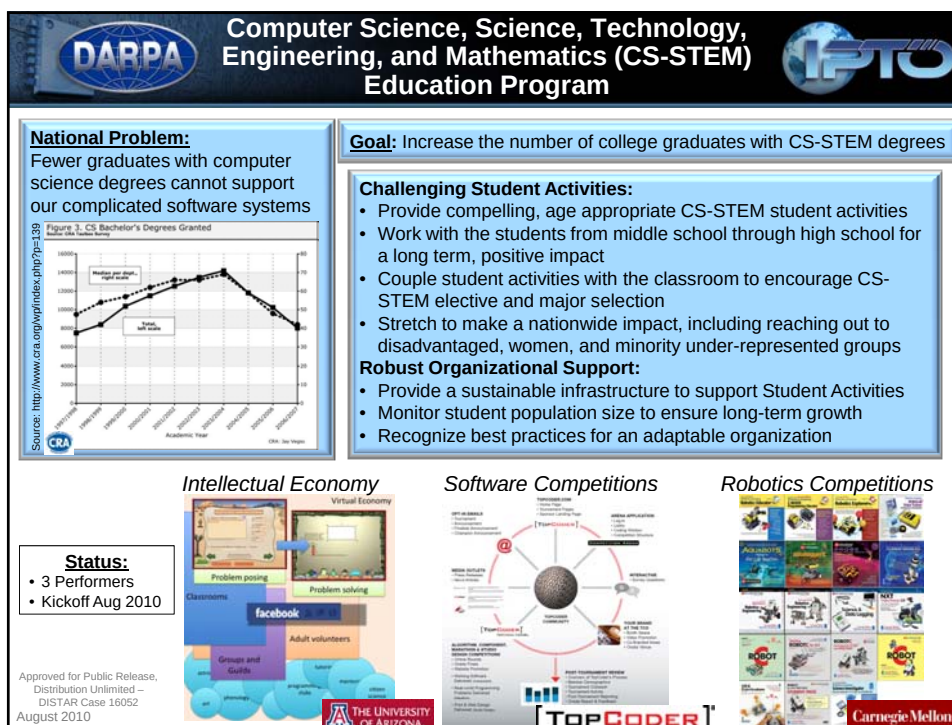
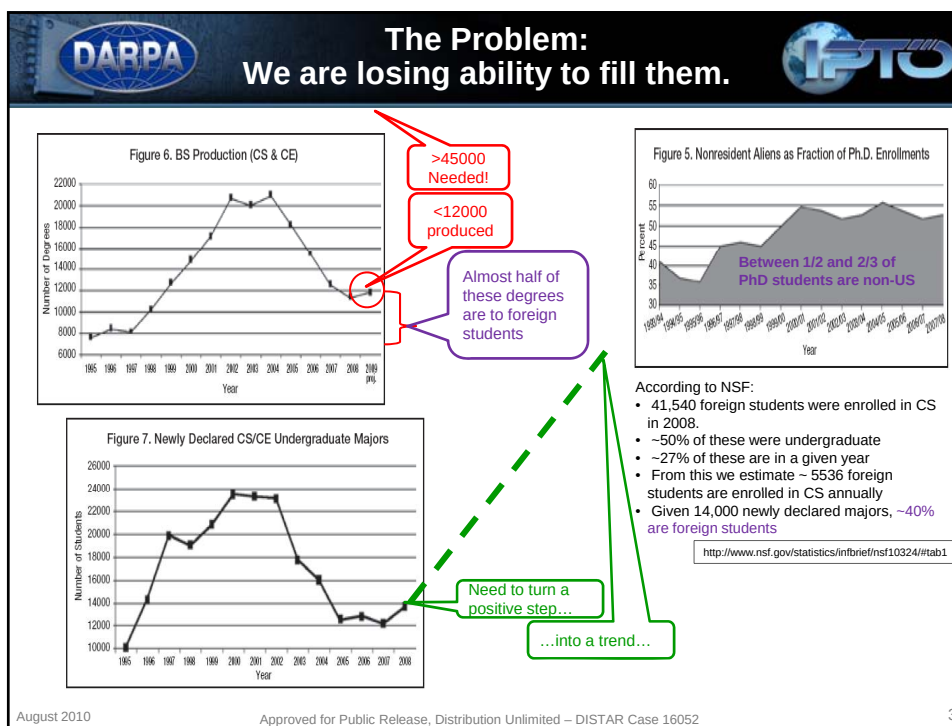
Three of the top six job creating fields are CS/CE related

The highest paying jobs of the top six are all CS/CE related

31% of job creation in top 30 fields belongs to CS/CE!

...with high projected growth...
~45,000 jobs per year!

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DARPA	Metrics	IPTO
Phase 1: Performance Metrics		
Continuity	Provide comprehensive, challenging activities from middle school through high school. Provide formal structure to encourage students to select CS-STEM academic coursework.	
National Presence	At least one student participating from at least 15 of the United States	
Sustainability	Goals stated in the detailed Sustainability Plan are being met	
Phase 2 and 3: Performance Metrics		
Continuity	Provide comprehensive, challenging activities from middle school through high school. Provide formal structure to encourage students to select CS-STEM academic coursework.	
National Presence	Number of students enrolled in the project increases 20% from the previous year, with at least one student participating from 15 of the United States	
Sustainability	Goals stated in the detailed Sustainability Plan are being met.	
	Retention: At least 80% students continue with the activities from the previous year	

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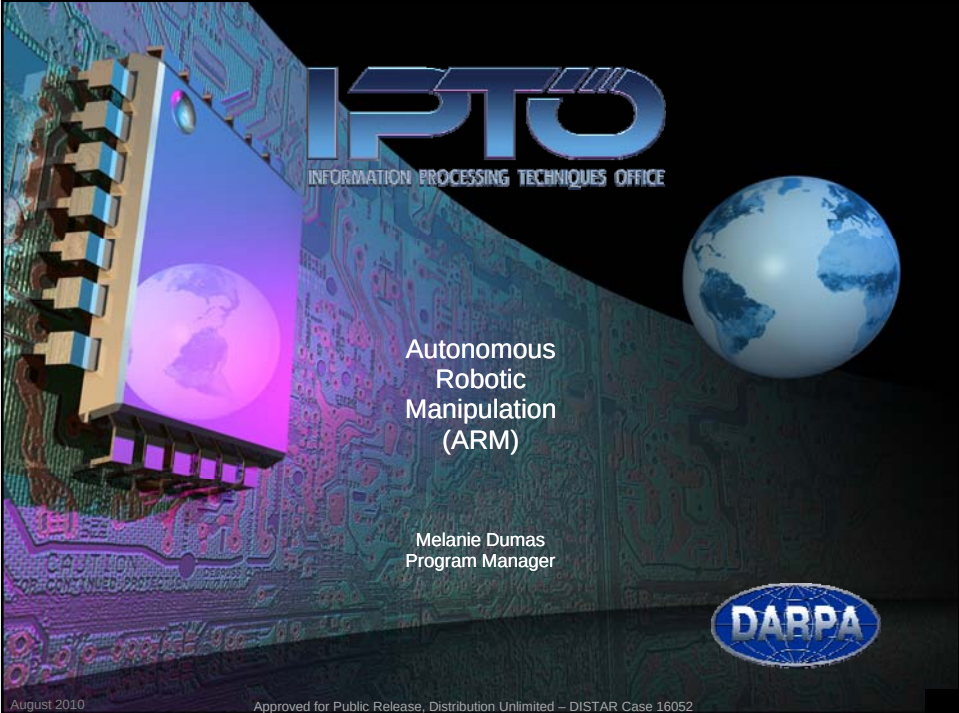
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Autonomous
Robotic
Manipulation
(ARM)

Melanie Dumas
Program Manager

August 2010

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ARM Program Motivation



We put people in danger every day, because sometimes hands are the only tools that work -- particularly in situations that need high resilience, flexibility, and adaptability.

The ARM program will enable military applications that can revolutionize the battlefield by making robots just as dexterous, resilient, and flexible.




Autonomous manipulation with a pair of mechanized arms/hands enables effective unmanned applications

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Technical Challenge



Manipulation requires many degrees of freedom (dof), and the results of contact are inherently unpredictable

Dimensionality

- Car: 2-dof (steer, accelerate)
- BigDog: 16-dof (4 x 4-dof legs)
- Pick Up Pen: 32-dof



6 dof

+



20 dof

+



6 dof

+



7 dof

+

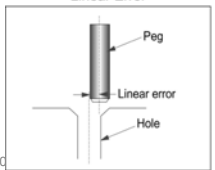


100s dof

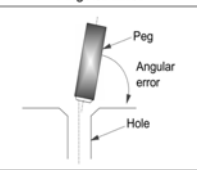
Contact Models

- Newton's laws can predict the outcome of physical interactions – Seems easy
- But motions are not performed or known exactly, so geometry is uncertain
- And forces are not applied exactly, so dynamics are uncertain
- And material properties (friction, stiffness) of real objects not uniform or well-known
- Soon, error bars swamp the knowns – Not so easy anymore!

Linear Error



Angular Error



*Uncertainty is the key issue
Adaptability is key*

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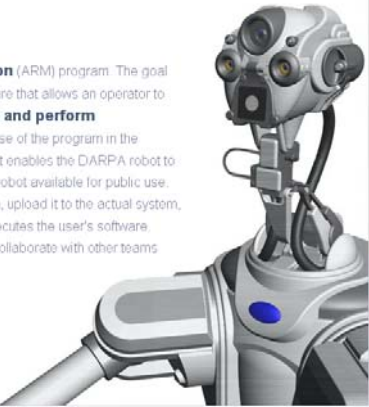
Collaboration Option: Write Software to control the ARM robot




Autonomous Robotic Manipulation

<http://www.theARMrobot.com>

[About the Robot](#)
[Participate](#)
[Name the Robot](#)
[Media](#)



DARPA is introducing its **Autonomous Robotic Manipulation (ARM)** program. The goal of this 4 year, multi-track program is to develop software and hardware that allows an operator to control a robot which is able to autonomously **manipulate, grasp and perform complicated tasks**, given only high-level direction. Over the course of the program in the Software Track, funded performers will be developing algorithms that enables the DARPA robot to execute these numerous tasks. DARPA is also making an identical robot available for public use. Allowing anyone the opportunity to write software, test it in simulation, upload it to the actual system, and then watch, in real-time via the internet, as the DARPA robot executes the user's software. Teams involved in this Outreach Track will be able to compete and collaborate with other teams from around the country.

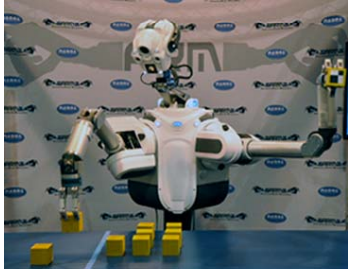
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Outreach Track



- In addition to the core ARM research program, DARPA will sponsor an Outreach Track
 - Opportunity for unfunded, external participant involvement
 - DARPA provides:
 - Hardware
 - Interface for remote development
 - Test environment
 - Technical support
 - Targeted participants
 - Students/educational institutions
 - Average citizen/hobbyist
 - Interested corporate teams
- **General participant outreach**
 - Global usage of user-developed code in identical ARM test environment
 - Opportunity for general community to develop code similar to funded teams
 - Focused public events (FIRST-type competitions)
- **Artistic outreach**
 - Museum events for general community use (e.g. creation of “techno-art”)
 - Ability to see technology and result in a public forum



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***WATCH FOR MORE UPCOMING
DARPA EDUCATION PROGRAMS!***

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Backup

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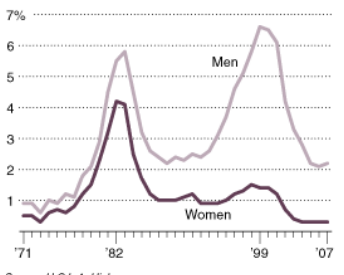
Women and CS



The New York Times November 15, 2008

Widening Gap

The percentage of female college freshmen who list computer science as a probable major is 0.3 percent, down from 4.2 percent in 1982.



Source: U.C.L.A. Higher Education Research Institute
Source: http://www.nytimes.com/2008/11/16/business/16digi.html?_r=1&em

New York Times article, Nov 2008

- **Families and Engineering**
 - “A lot of the girls who were doing computer science came from families of computer scientists and engineers.”
 - “It was in the air. There was the expectation that they could do whatever they wanted.”
- **Focus on gaming**
 - “The girls game movement failed to dislodge the sense among both boys and girls that computers were ‘boys’ toys’ and that true girls didn’t play with computers.”
 - “Some people in the field still believed that the answer to reversing declining enrollment was building the right game “
 - World of Warcraft has 30% women (according to womengamers.com)
- **Conclusion:**
 - We don’t really understand why women aren’t pursuing CS degrees

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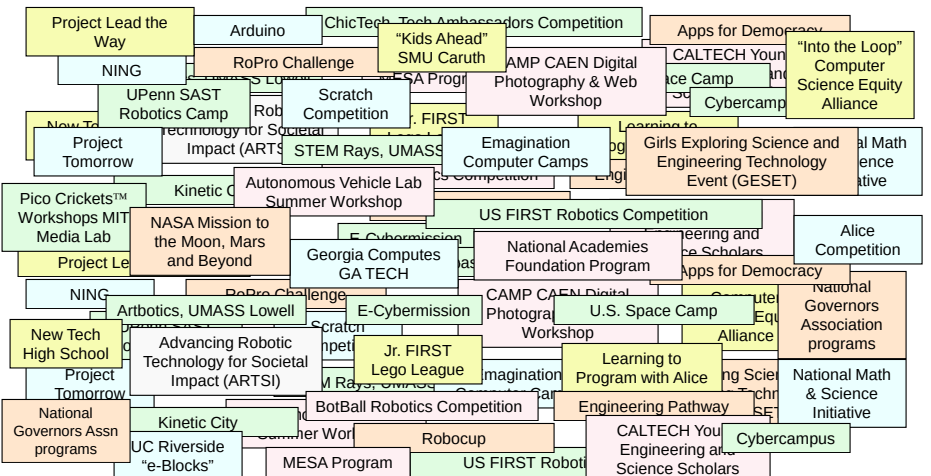


Thousands of programs exist to improve CS education

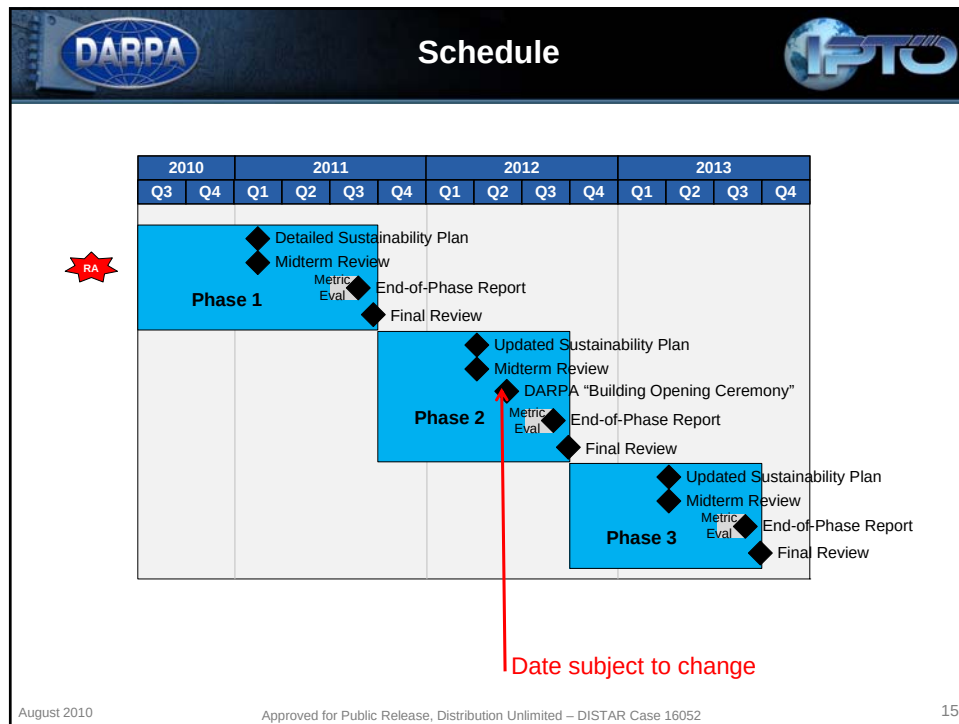


Many programs and events are effective locally, but:

- they lack systematic linkage to other programs
- they lack a national organizational structure to scale them up



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Preparing US Citizens for the Deluge Time to Get Going!

Joan Peckham
Program Director
NSF

OCI – Office of Cyberinfrastructure
Learning and Workforce Development



Computing & IT Education Needed

Technology and data touch everyone

- Era of open government
- Data exploration - 4th paradigm of science
- Jobs – Well trained workers needed
- Evidence based problem solving
- From laptop concerts, to understanding the universe, and to protecting our nation's interests

We should not outsource our critical security needs.



So what is the problem?

Change in need for well trained workers by 2018

Software engineers, programmers,

- Computer network systems and database administrators (+30%)
- Computer software engineers and computer programmers (+21%) (with programmers projected at -3%)
- Computer systems analysts (+20%)
- Computer, information scientists, and research (+24%)
- Computer support specialists (+14%)

Compare to engineering technicians decreasing or in the single digits and with engineers doing a tad better.

- Technicians(+5%) - Exceptions are civil engineering technicians (+17) and environmental engineering technicians (+30)
- Engineers (+10%) Highest are civil (+24%), environmental (+31%), biomedical (+72%)

Overall employment expected to increase by 20% in the same period



Another Way to Look at It

Among the 20 fastest growing jobs through 2018, BLS finds:

- #2 - Network systems and data communications analysts (53% growth)
- # 15- Computer software engineers, applications (34% growth)



Even the Military has Needs

As of Jan. 2009 – Of 1,226,460 Enlisted Employees
(and 14 categories – 87,604 if evenly distributed)

- Electronic and electrical repair occupations
141,064
- Engineering, science, and technical occupations
151,028

Only others higher were:

- Combat specialty -193,503
- Transportation and material handling - 183,683



What are we producing? CRA Taulbee Survey 2008-2009

Figure 6. BS Production (CS & CE)

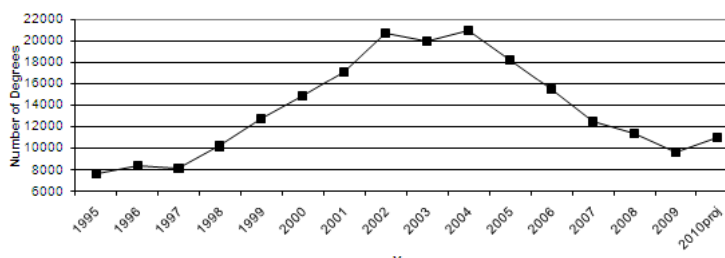
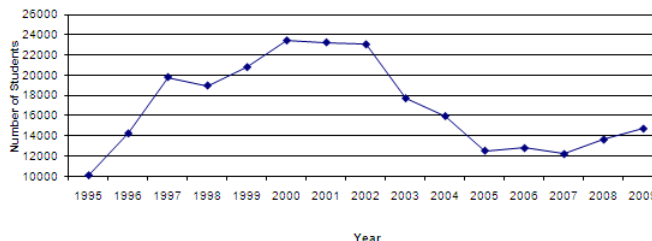


Figure 7. Newly Declared CS/CE Undergraduate Majors





The Role of Informal Learning

Recent NSF Funded Study – NPR, Oct. 2010

- Stronger And Smarter: Informal Science Learning In Rural American Libraries
 - Elementary-school children perform as well in science-understanding metrics as their peers
 - Middle- and high-school students perform abysmally
 - American adults demonstrate scientific knowledge on a par or above adults in other “developed” countries
 - 30% of adult Americans have ever taken even one college-level science course
 - Knowledge is acquired via what is called **informal science education** or **free-choice science learning**



2009 Report of the National Academies on Informal Learning

- Infancy - late adulthood: Learn about the world & develop important skills for science learning.
- A great deal of science learning, *often unacknowledged*, takes place outside school in informal environments.
- Learning in informal environments involves developing positive science-related attitudes, emotions, and identities; learning science practices; appreciating the social and historical context of science; and cognition.
- Informal environments can be particularly important for developing and validating learners' positive science-specific interests, skills, emotions, and identities.



How to Strengthen Informal Education With Rigor and Vigor

- Excitement, interest, and motivation to learn about phenomena in the natural and physical world.
- Generate, understand, remember, and use concepts, explanations, arguments, models and facts related to science.
- Manipulate, test, explore, predict, question, observe, and make sense of the natural and physical world.
- Reflect on science as a way of knowing
- Participate in scientific activities and learning practices with others, using scientific language and tools.
- Think about themselves as science learners and develop an identity as someone who knows about, uses, and sometimes contributes to science.

-From the 2009 National Academies report on informal learning-



Informal but Rigorous Computing & IT

How to inject the rigor?

Computational Thinking

- Core constructs of computing and computational science
- For everyone – citizen to scientist
- Fluency in the language of computing and our modern world – all disciplines



Computational Thinking What is it? What should we know?

Citizens and Scientists alike should know ...

- ▶ Animation of algorithms/processes
- ▶ Managing consequences of scale
- ▶ Error prevention - testing, debugging, recovery, and correction
- ▶ Data collection, archival, retrieval, exploration
- ▶ Step by step, interactive problem formulation, simulation, and solving
- ▶ Collaborative and plugged-in approaches



Interactive Problem Solving Intrepid Exploration

- Abstraction
- Breaking problems down into digestible parts
- Organized plug and play & debug
- And **Without Fear!**

Jill Denner –ETR Associates - Intrepid Exploration
(Sherry Turkle) – CT for Everyone Workshop, February 4-5,
2009, National Academies



Computational Thinking Endgame for NSF

Research

- New mental tools
- New interdisciplinary efforts
- Innovation

Education

- Prepare the next generation
 - For computing
 - For new emerging disciplines
 - Strengthen existing disciplines
 - Stronger citizens, stronger nation



Preparing Citizens for the Deluge Time to Get Going!

THANK YOU!

Transforming HS Computing Education

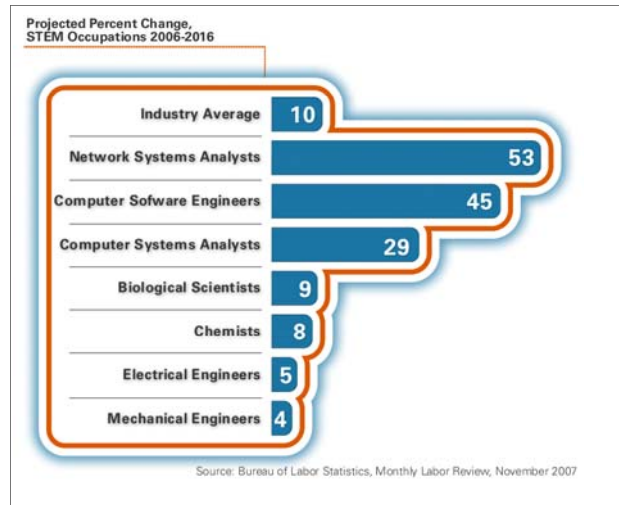
Jan Cuny

National Science Foundation

Oct. 18, 2010

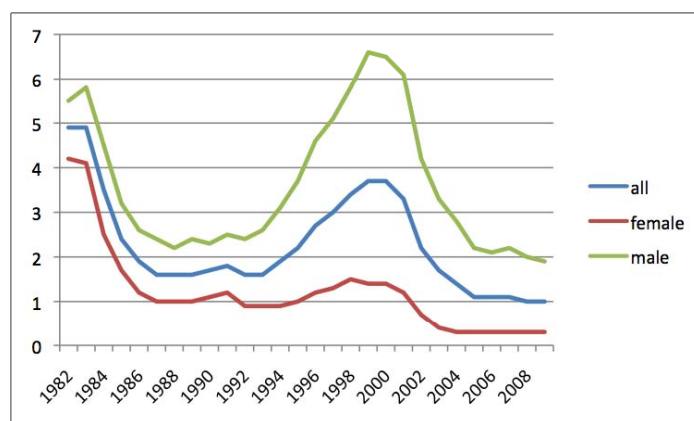
We have a problem in computing

Projected STEM job growth is in IT



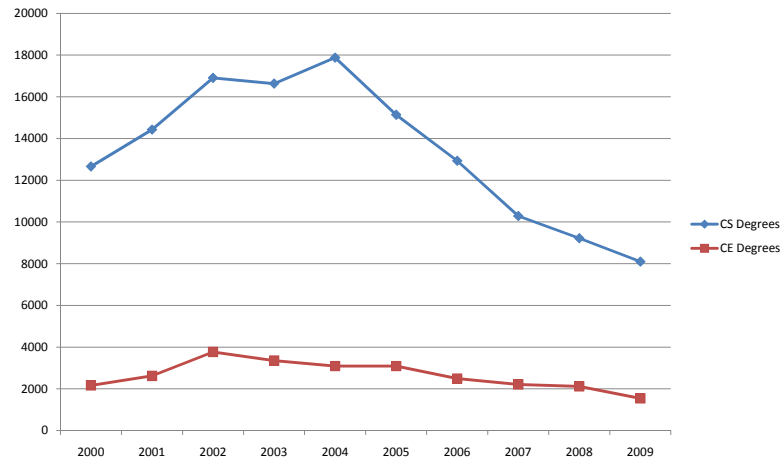
Slide: Dr. Chris Stephenson, CSTA, Data: BLS

% Freshman interest in CS



Source: HERI; Figure: NCWIT

Plummeting CS degrees



CRA Taulbee Survey, 2008-2009

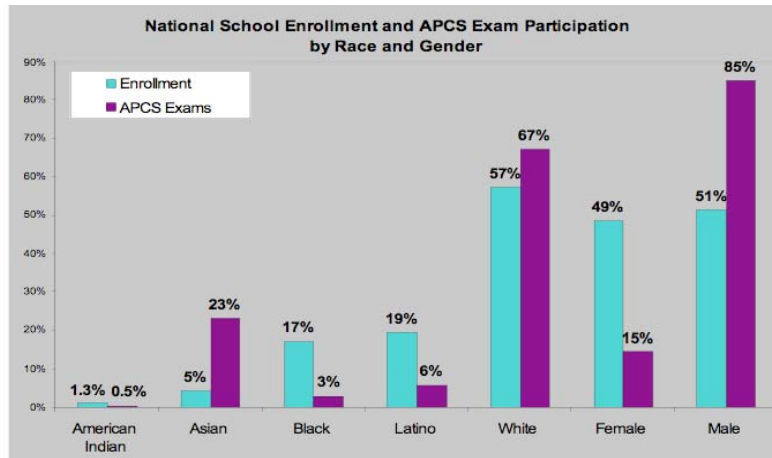
Underproduction

By 2018, there will be 1.4 million computer specialist job openings.

US universities will have generated enough graduates to fill about 1/3 of these openings.

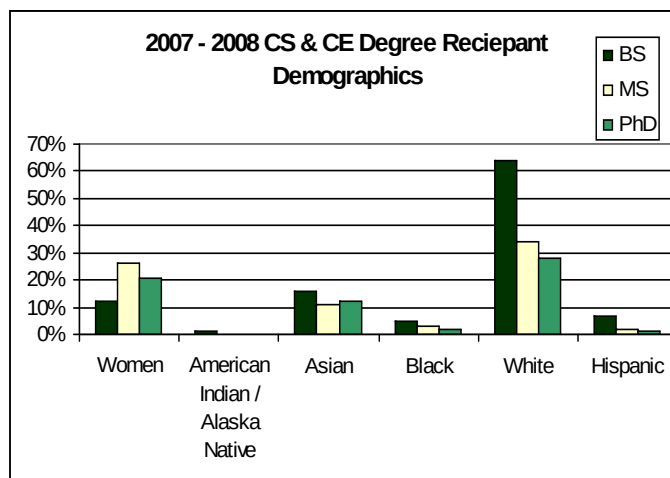
NCWIT, By the Numbers, 2009

The missing 70%



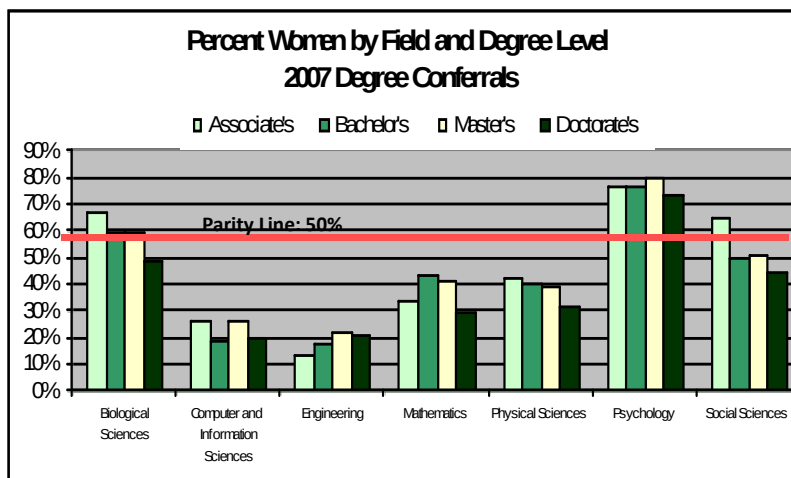
Slide: Dr. Chris Stephenson, CSTA, Data: College Board

The missing 70%



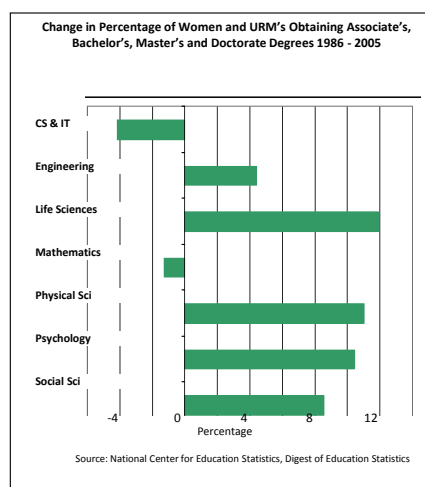
CRA Taulbee Survey, 2007/2008

How we compare



Source: Dr. Lisa Frehil, CPST

Trends in Underrepresentation



Source: National Center for Educational Statistics,
Digest of Educational Statistics

Why does underrepresentation
matter?

It's a loss of

- Opportunity for individuals
- Talent to the workforce
- Innovation and creativity to the field and to our economy

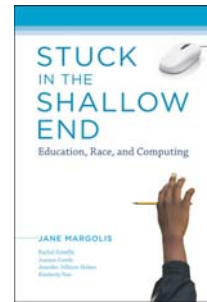
ACM Programming Contest

Place	Name
1	Shanghai Jiaotong University
2	Moscow State University
3	National Taiwan University
4	Taras Shevchenko Kiev National University
5	Petrozavodsk State University
6	Tsinghua University
7	Saratov State University
8	University of Warsaw
9	St. Petersburg State University
10	Zhongshan (Sun Yat-sen) University
11	Fudan University
12	KTH - Royal Institute of Technology
13	Ural State University

High school is the key to fixing it

Why High School?

1. We need to do *much* better there.

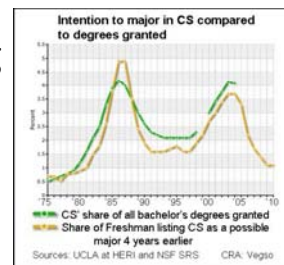
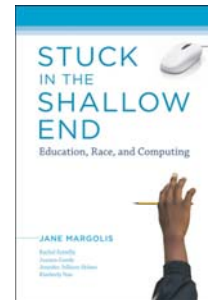


The state of HS CS

- Since 2005, introductory secondary school computer science courses have decreased in number by 17%, AP CS courses by 33%
- 2/3 of states have few computer science standards for HS
- Widespread confusion about technology education, literacy and fluency, and IT & CS as academic subjects
- Few states count CS in graduation core

Why High School?

1. We need to do *much* better there.
2. Without the HS piece, anything we do for middle school will be lost.
3. Without the HS piece, anything we do at the college level will be insufficient.



Why focus on AP?



- Often the only CS course that carries college prep credit
- Attractive to students & schools
- 2,000 CB-audited teachers
- Single point of national leverage

Proposed AP CS Principles



- Engaging, accessible, inspiring, rigorous
- Focused on the fundamental concepts of computing (CT)
- A target for K through 9 course development and an impetus for college curriculum reform
- Available nationwide with fidelity of replication

New High School Curriculum

- Introductory course for everyone
- Proposed AP CS Principles
- AP CS Programming

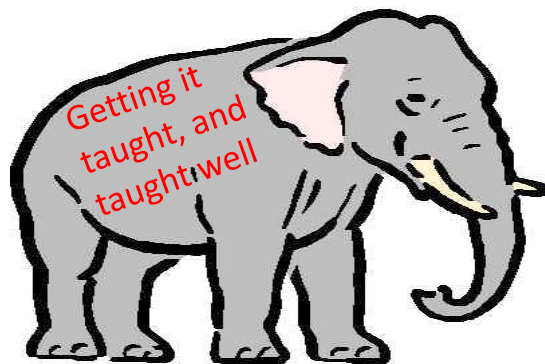


ECS Team at LAUSD

AP CS Principles is a college course

2010 Pilots

- University of Washington
- UC Berkeley
- UC San Diego
- Metropolitan State College of Denver
- UNC Charlotte



CS 10K

Develop an effective new high school computing curriculum and get it taught in 10,000 schools by 10,000 well-prepared teachers by 2015.

CS 10K Project

- Curriculum development
- Teacher Preparation
 - In-service preparation
 - Pre-service preparation
 - Ongoing professional development
- Entrée into schools

**Needed:
Public/Private
Partnerships!!**

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Computing Education for the 21st Century (CE21)

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PROGRAM GUIDELINES

Solicitation [10-619](#)

Please be advised that the NSF Proposal & Award Policies & Procedures Guide (PAPPG) includes guidelines implementing the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: Grant Proposal Guide Chapter II for further information about the implementation of this requirement).

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Building momentum

WHAT IS BPC? - NSF BPC COMMUNITY - BPC DIGITAL LIBRARY - HELP



Broadening Participation in Computing

Making a World of Difference, Changing the Face of Computing

Broadening Participation in Computing (BPC) is a NSF sponsored program with the goal of significantly increasing the number of underrepresented graduates in the computing disciplines, with an emphasis on women, persons with disabilities, and minorities (African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders).

Looking for partners for your project, or the latest news and events? Find what you need in the [NSF BPC Community](#). Looking for resources? Visit the [BPC Digital Library](#) to search, browse or add high-quality teaching, learning, recruitment, retention and assessment resources.

What Is BPC? >>
NSF BPC Community >>
BPC Digital Library >>

Become a dot diva
Parents & Teachers

dot diva

We're young women with the power and passion to make a difference. We believe in the potential of computing to build a better world.



Dot Divas change the world. We develop medical software that saves lives and design programs that track the environment to help protect our planet.

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What's Your Passion?

My passion is...

- Advertising
- Archaeology & Anthropology
- Art & Art History
- Astronomy & Space
- Exploration
- Business
- Communications
- Computer Graphics & Media
- Cooking
- Disabilities
- Education
- Engineering
- Environment
- Fashion & Design
- Film, TV, & Theater

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National Lab Day

Join Login

HOME ABOUT NLD PROJECTS RESOURCES COMMUNITY

Bring Exciting Hands-On Learning to Your Area

It's more than just a day.
We're building a community.

[JOIN NATIONAL LAB DAY](#)

National Lab Day is a nationwide initiative to build local communities of support that will foster ongoing collaborations among volunteers, students and educators. [Learn more.](#)

Contact us with your successful NLD experiences. Please also visit our NLD Success page [click here](#).

NLD Video Contest - Extended!

National Lab Day is hosting an online video contest. We want to see your projects!

The new deadline is **October 1st**.

The first place winner will receive a \$1,500 DonorsChoose.org Gift Card and a Flip Video Camcorder.

NLD Photos [see more >](#)



Computer Science EDUCATION WEEK

csedweek.org

Raising Awareness of Computing & its Role in Society

NAVIGATION

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 - People are Talking



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Computer Science Education Week, December 5-11, 2010, recognizes that computing:

- Touches everyone's daily lives and plays a critical role in society
- Drives innovation and economic growth
- Provides rewarding job opportunities
- Prepares students with the knowledge and skills they need for the 21st century

Why is Computer Science Education Important?

- It exposes students to critical thinking
- It is essential for success in the digital age
- Too few students are exposed to opportunities presented by computer science

Educators, parents, policymakers, professionals and students are invited to become part of this important effort by utilizing the [valuable resources on this web site](#).

WELCOME TO CSEDWEEK

FROM ACM CEO JOHN R. WHITE



CSEDWEEK INFORMATIONAL TWOPAGER

This PDF twopager provides background information on CSEDWeek, highlights computer science education



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MOBILIZE: Mobilizing for Innovative CS Teaching & Learning' 1st CS-focused grant by the Math/Science Partnership @ NSF
<http://bit.ly/bqUj2W>
 5 hours ago

Fall means back to school & that means students should start thinking about the #SIGGRAPH 2011 SV Program! <http://youtu.be/djCWf8U...>
 5 days ago

welcome to @hyattatlanta for the tenth Grace Hopper Celebration of Women in Computing! #ghc10 #techwomen w00t!
 5 days ago

Computer Science in the News: Springfield High looks at computers in-depth <http://bit.ly/9w7jdK> via @PhillyInquirer
 4 days ago

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Thanks!

<http://csprinciples.org>

<http://csprinciples.cs.washington.edu>

<http://www.computingportal.org/cs10k>

Jan Cuny
jcuny@nsf.gov

DoD STEM Board member and Action Officer Summit - October 18, 2010

-- List of useful Website URLs – Page 1 / 2

- National Center for Women & Information Technology - <http://www.ncwit.org>
- “Stuck in the Shallow End: Education, Race, and Computing” by Jane Margolis
- <http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11550>
- NSF Directorate for Computer and Information Science and Engineering -
<http://www.nsf.gov/cise/about.jsp>
- NSF Broadening Participation in Computing (BPC) – <http://www.bcportal.org>
- Dot Diva – <http://www.dotdiva.org>
- <http://picturemeincomputing.com>
- Fostering Innovation Through Robotic Exploration – <http://www.fire.cmu.edu>
- Teach Ourselves -
<http://www.cs.arizona.edu/projects/focal/edinfo/teachourselves/>

DoD STEM Board member and Action Officer Summit - October 18, 2010

-- List of useful Website URLs – Page 2 / 2

- Excelencia in Education – <http://www.edexcelencia.org/>
- National Lab Day – <http://www.nationallabday.org>
- Computer Science Education Week – <http://www.csedweek.org>
- NSF Office of Cyberinfrastructure - <http://www.nsf.gov/dir/index.jsp?org=OCI>
- National Public Radio – “Stronger And Smarter: Informal Science Learning In Rural American Libraries” - <http://n.pr/9bxMil>
- DARPA Autonomous Robotic Manipulation – <http://theARMrobot.com>
- New York Times – “Widening Gap” -
http://www.nytimes.com/2008/11/16/business/16digi.html?_r=1&em
- CS Principles - <http://csprinciples.org> & <http://csprinciples.cs.washington.edu>
- Connecting Computing Educators - <http://www.computingportal.org/cs10k>