



Voice

The Voice of K–12 Computer Science Education and its Educators

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Promoting CS

Computer Science Education Week

An Opportunity in the National Spotlight

Editor's note: Joel Adams, Professor of Computer Science at Calvin College, spearheaded the drive to have National Computer Science Education Week declared an annual event. He shared with CSTA how it all came about.

CSTA: What prompted you to work for a National CS Education Week?

Adams: In 2008, I attended a conference where CSTA Executive Director, Chris Stephenson, explained how *No Child Left Behind* (NCLB) was having the unintended consequence of harming high school computer science (CS) programs nationwide. The problem occurred as administrators cancelled AP CS courses and reassigned teachers to teach other classes in order to meet NCLB requirements.

I also learned that educators in some states including Georgia, North Carolina, and Texas had proactively worked to have AP CS meet NCLB requirements. My initial reaction was to do something to prevent NCLB from weakening CS programs in my home state of Michigan.

CSTA: Where did you start? What was the process?

Adams: I naively thought that since NCLB was a federal program, there ought to be a way for the federal government to change the requirements for all 50 states, rather than for teachers to refight the same battle state-by-state.

My congressional representative and former Calvin physics professor, Rep. Vern Ehlers, serves on the House Science and Education Committees. I scheduled

a meeting with him and took along data from the U.S. Bureau of Labor and CRA's Taulbee Survey (cs.calvin.edu/p/ComputingCareersMarket). Rep. Ehlers was aware of the great opportunities for those with CS degrees, but he was surprised to learn of the steep decline in CS enrollments. He quickly saw the negative implications for our country's long-term economic health and our ability to continue as a world leader in technology innovation.

I learned that each state sets its own NCLB graduation requirements and while I was disappointed that the NCLB problem could not be solved at the federal level, Rep. Ehlers promised to discuss the problem with his colleagues on the House Education and Science Committee. The result of Rep. Ehlers' work was *House Resolution 558* that each year recognizes the week of Grace Hopper's birthday as National Computer Science Education Week. The resolution passed by a bipartisan vote of 405-0.

CSTA: What were the greatest roadblocks? Have you had any push-back?

Adams: I have not really experienced much push-back other than a lack of response from State of Michigan education leaders regarding the issue.

The original problem—How do we prevent NCLB from weakening HS CS programs?—remains unsolved. I'm working to make an impact (bolstered by the enactment of the National Computer Science Education Week) here in Michigan, in the hopes of *continued on page 2*

CSTA wishes to thank Joel Adams

CS Department Chair,
Calvin College,
for outstanding
advocacy work.

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COMPUTER SCIENCE EDUCATION WEEK *continued from page 1*

revising the state's NCLB requirements.

Also, a problem persists among some technology educators who believe they are adequately preparing students for today's economy with skills in the Microsoft Office Suite and an option to learn CAD tools. These programs may adequately prepare students for some careers, but not for the careers that require algorithmic thinking to solve problems and generate technological innovations.

CSTA: What do you hope will come from this effort in the short term?

Adams: I hope teachers will present *House Resolution 558* to their administrators and say, "Look, Congress has said this is important. We need to not just maintain our existing computing classes but strengthen them, and do a better job of promoting CS to reverse the nationwide decline."

CSTA: What message do you have for CS teachers across the country?

Adams: If you live in one of the 47 states where AP CS does not count towards the NCLB requirements, lobby your state education officials to change the NCLB requirements. Cite *House Resolution 558* as a basis for the change. The final resolution is available online at thomas.loc.gov/home/gpoxmlc111/hr558_ih.xml.

Take advantage of the videos, brochures, and other promotional resources ACM assembled to support National

Computer Science Education Week (www.csedweek.org).

Promote CS among your students, especially young women. Talk to parents, guidance counselors, and administrators. Tell them that through 2018, nearly three-quarters (71%) of the new science, technology, engineering, and mathematics (STEM) jobs are predicted to be in CS or information systems.

Take advantage of the videos, brochures, and other promotional resources ACM assembled to support National Computer Science Education Week (www.csedweek.org).

CSTA: What do you hope will be the long-range impact of this resolution?

Adams: My hope is that states and school districts across the country will adopt the *ACM Model Curriculum for K-12 CS*, including an AP CS course. Another hope is that parents, guidance counselors, teachers, media sources, and others who influence students' career choices, will encourage all students to consider a career in CS.

CSTA: How will you know you have succeeded?

Adams: I will have succeeded when CS is seen as a core component of K-12 education and when the typical university CS department is graduating as many women as it is men. When those things happen, I'll be happy.

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CSTA Voice is a quarterly publication for members of the Computer Science Teachers Association. It provides analysis and commentary on issues relating to K-12 computer science education, resources for educators, and information for members. The publication supports CSTA's mission to promote the teaching of computer science and other computing disciplines.

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Managing School E-waste

Part One: The Crisis and the Case for Reuse

Marc Breslav

Editor's note: This is Part 1 in the two-part series on managing school e-waste. In the next issue of the Voice, we will explore strategies for effectively recycling e-waste.

DESPITE THE CURRENT EMPHASIS ON sustainability, schools are discarding a goldmine of electronic equipment. This e-waste, in many cases, can generate "green" income. Some of your equipment can be restored for reuse elsewhere, including at less affluent schools, and what can't be reused can be properly and ethically recycled.

If not addressed properly, e-waste is a sustainability nightmare and a global crisis. E-waste has hazardous components with known toxicological effects, including polyvinyl chlorides and heavy metals like lead, cadmium, chromium, and mercury.

Processed in primitive conditions, e-waste severely endangers the environment, workers, and communities.

In 2007, 157 million computer products were discarded—130,000 computers daily in the U.S. The global volume of e-waste is projected to shortly reach 73 million metric tons annually, comprising more than 5% of the municipal solid waste stream.

In a recent year, only 11.4% of the consumer electronic product load in the municipal waste stream was "recycled." Industry sources claim that about 80% is shipped to developing countries. *Sixty Minutes*, reporting in November 2008, has documented improper dumping abroad. The carcinogenic leachates end up in the drinking water of already impoverished people, or in the air they breathe, where the waste is burned. Processed in primitive conditions, e-waste severely endangers the environment, workers, and communities.

Reuse Trumps Recycling

Hopefully the day is gone when schools are throwing their e-waste in the dumpster. But school systems might believe they must pay to have e-waste specially hauled away. And while that is an

improvement on commingling e-waste in the dumpster, most have no way of knowing whether the waste is disposed of properly.

Some school systems know that they can sell their e-waste for scrap, earning pennies on the ton for recycling. But few have a way of knowing whether, if, and when the precious metals are extracted, the remaining scrap with no value is land-filled, or again worse, discarded illegally.

There is a fairly new option, where a relative handful of companies will pay institutions for the electronic equipment itself, based on the cost to refurbish the equipment, the cost to remarket it, and the price that can be charged for the pre-owned components.

The "3 Rs" mantra for years has been "reduce, reuse, then recycle," in that order

of priority. "You can accomplish more by reusing a computer, for example, than by using the additional resources and energy needed to

recycle its components and manufacture a new PC from scratch," says Richard Sommers, president of The IT Asset Management Group.

"Some firms will buy all sorts of equipment, including copy machines, printers, monitors, PCs, main frames, mid-range equipment, and telephone systems," he says. Others specialize only in certain manufacturers, Cisco being a prime example.

The Green Computing Initiative of the Consortium of School Networking (K-12 school district technology leaders) recommends that schools:

- Research vendor and independent e-waste programs and develop your disposal policy and practices accordingly.
- Employ a strong policy concerning computer donations. Don't become someone else's e-waste site.

Learn more at www.cosn.org.

Next, in the July issue: *Six steps to maximize returns from electronics that would otherwise be discarded.*



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Letters to the Editor are limited to 200 words and may be edited for clarification.



ACM founded CSTA as part of its commitment to K-12 computer science education.

Computer Science Education Week

December
5–11

Computing

- ▶ Touches everyone
- ▶ Drives innovation
- ▶ Offers cool careers
- ▶ Keeps us competitive

CS Education

- ▶ Builds our future
- ▶ Teaches 21st century skills
- ▶ Opens doors
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with others

Gather
resources

Make plans
today!

www.csedweek.org

Code-based Programming in the Middle School with Phrogram

David Witus

AT THE MIDDLE SCHOOL LEVEL, programming is about learning how to think abstractly and use math concepts to solve practical problems. But because students in these grades are so immersed in digital experiences, they may find the focus on interactive stories and “creative expression” in tile-based environments, such as Alice and Scratch, too simplistic and more appropriate for younger learners.

So, what can an educator offer? One option is Phrogram, a .NET language and environment that presents writing and debugging source code in a way that emulates how working programmers typically develop software, yet simplified to be within a beginner’s reach.

Using code editing, syntax checking, and debugging tools patterned after more complex languages and environments, students at this level may appreciate Phrogram’s “realistic” feel. Teaching materials are plentiful, from sample files accompanying the product to user uploads on Phrogram’s website (phrogram.com), as well as the book, *Phrogram Programming for the Absolute Beginner*, by Jerry Lee Ford, Jr.

Phrogram is well-suited for creating simple 2D games, such as Pong, where the first concepts covered could be the coordinate system, and placement and manipulation of media files. Guidance can be offered on developing methods, conditional branching, and controlling an inserted image file (or “sprite”) through user interaction or loops. This is similar to how, in tile-based languages, the graphical stacking of commands translates into moving images and sounds. Phrogram, however, uses code statements to achieve these results. Projects can be customized with media files chosen by the students, along with whatever math or logic constructs appeal to their interests.

Sample Lesson Ideas

Creating a flag is an interesting first program. To create a U.S. flag, start by

asking the student to research the flag’s layout, to set screen width and length, and determine the placement of its primary elements. Each aspect, such as size and shape of the red stripes and blue background for the stars, or “union,” can be tackled in separate methods: make star; make stripes; make union; and put stars on union. Each method is then “called” in the appropriate order, in the Method Main() that runs the program. Projects to create other flags or student designs can be similarly planned.

BuzzOff! is another interesting project for beginners. The program uses an image file that is stamped onto the screen, becoming its background rather than a separate layer. The program detects pixel

Projects can be customized with media files chosen by the students, along with whatever math or logic constructs appeal to their interests.

color of a wire that is part of the stamped image. While the mouse is over this wire, no sound is made; otherwise, a buzzer rings and a “point” is recorded. An event counter increments each time the mouse moves off the wire. In just 50 lines of code, the program provides a simple, yet complete game experience, using event counting and pixel-detection accuracy based on cursor positioning.

In both examples, students can break down the project into manageable tasks and come up with a solution for each one, much as working programmers do for more complex projects. In creating the flag, if the math to draw a star is beyond the student’s grasp, it can be provided separately and the remaining tasks can be achieved step-by-step. In the game, tracking the mouse’s position, triggering a sound when it goes off course, and counting how often this happens, are examples of programming concepts that can be easily transferred to future projects.

These and other programs available on Phrogram's website show how using a code-based environment need not force the teacher into explaining the details of syntax; rather, program design can first be explored, then code can be written and tested to achieve a specific outcome.

With code-based programs and projects available for a variety of skill levels, teachers will find that Phrogram can be an excellent tool for exploring programming concepts at the middle school level without obscuring their essential "code-based" nature.

Growing Professionally Through Blogs

Michelle Hutton and Alfred Thompson

WHETHER YOU "OWN" YOUR OWN BLOG or follow others, blogs are a useful source for gathering teaching ideas, learning about new technologies, and being a part of a larger community of computer science (CS) educators.

Reading blogs doesn't have to be time consuming. Most blogs are fairly short in format—usually no more than a few paragraphs. Even if the writer publishes often there is absolutely no pressure to "keep up" by reading all of them.

If you are going to follow several blogs, it makes sense to use an RSS reader. An RSS reader is similar to an e-mail program. It allows you to subscribe to blogs, organize them into folders, and delete or keep posts as desired. Google Reader is one example of an online reader. Some mail clients, including Microsoft Outlook, provide tools for reading blogs. There are also many client-based readers such as RSS Bandit and Vienna. Posts gathered by a client-based reader can be conveniently read offline. Learn more about RSS and blog readers at en.wikipedia.org/wiki/RSS_Reader.

Writing your own blog is a great way to engage with the larger CS community or communicate with students. Teachers use blogs as a way to record and communicate information about what is going on in class by listing assignments and supplemental resources. A classroom blog can be

an easy way to inform parents about what is happening in class and to overcome the old "the dog ate my assignment book" problem. You can also use blogs written especially for teachers or CS educators to share teaching and projects ideas while gathering feedback from your peers. For CS teachers who are the only one in their buildings, blogs create an avenue to interact with peers and to build a personal learning network.

Blogs require a few unique management skills. Keep notes on potentially interesting blog ideas to write about. If students will read and comment on your blog, enable blog moderation so that you can read comments before they are actually published.

Blogs can also be a teaching tool. Many students who are too shy to join in on classroom discussions may be more willing to write comments on a blog. Posting an interesting link or discussion topic can open the doors to lively and educational discussions both in and out of classroom.

Even if you don't write your own blog, feel free to read and contribute comments to other blogs. Your experiences and your knowledge are worth sharing with others.

Start now! See the list of blogs suggested for CS teachers by CSTA President, Michelle Hutton, at blog.acm.org/archives/csta/2010/02/blogroll.html. Visit Alfred Thompson at blogs.msdn.com/alfredth.

Meet the Authors

Marc Breslav

Breslav Public Relations, NY
Marc has managed an environmental public relations and marketing firm since 1983 and was the founder and a faculty member of the former Business and the Environment continuing education certificate program at New York University.

Gail Carmichael

Carleton University, Ontario, Canada
Gail is a CS Ph.D. student researching educational games and augmented reality. She is an executive member of the Carleton University Women in Science and Engineering group, and participates in many outreach initiatives for younger girls.

Michelle Hutton

CS Educator, Mountain View, CA
Michelle is the president of the CSTA board, where she was previously the vice president and equity chair. She chairs the CS department and teaches CS at The Girls' Middle School.

Ruth Kiefer

USA Science & Engineering Festival
Ruth is co-director of the first USA Science & Engineering Festival to be held in October 2010. She was part of the team that created the inaugural San Diego Science Festival in 2009.

Alfred Thompson

K-12 CS Academic Relations Manager, Microsoft
Alfred was a CS teacher for eight years, has written several text books, and has been an AP CS reader. He has written his own blog, the Computer Science Teacher, for several years.

David Witus

The Phrogram Company
David is a co-founder of Phrogram, an educational software product launched in 2006 as the successor to Kids Programming Language (KPL). He is responsible for Phrogram's community development, marketing, and educational outreach efforts.

CS & IT Symposium

July 13, 2010 Mountain View, CA

Explore issues and trends relating directly to your classroom

Network with top professionals from across the country

Interact with other teachers to gain new perspectives on shared challenges

Download the agenda! Register today! www.csitsymposium.org

Out and About the Community

USA Science & Engineering Festival

Ruth Kiefer

Where is the computer science in video games? What do engineers have to do with baseball? Where's the math in magic tricks and hip-hop? What can amphibians and reptiles tell us about the environment? What is the universe made of?

This October, K–12 students in the greater Washington, DC, area and across the country can find the answers to these and other questions at the USA Science & Engineering Festival—the first national festival of its kind. In line with President Obama's Educate to Innovate initiative, the two-week Festival is an all-out celebration of science that aims to inspire the next generation of scientists and engineers through hundreds of free, hands-on science activities, events, and contests. The Festival is a grassroots effort supported by over 350 of the nation's leading science & engineering organizations, including CSTA!

While many programs are focused on the greater Washington, DC, area, students and teachers across the country can get involved through satellite events and national contests.

GET INVOLVED IN THE DC AREA

- Match skills in a Rubik's Cube Tournament! Teams of eight will compete for the fastest time to collectively solve 25 Rubik's Cubes. All public, private, religious, home schools, after-school, and other community youth organizations in the Greater Washington, DC, area (including Virginia and Maryland) serving grades K–12 can participate. Registration deadline is May 31.
- Apply to host a Nifty Fifty speaker at your school! The Nifty Fifty are a group of noted scientists and engineers who will fan out across the Washington, DC, area to tell students at middle and high schools about their work and careers.
- Attend the Expo on the National Mall! During the two-day event Expo goers can build an underwater robot, chat with a Nobel Laureate, explore the science behind the magic of Hogwarts Academy, and see a car that drives itself. From bugs to birds, kitchen chemistry to computer games, environmental monitoring to electronic music—the Expo has something for everyone and is completely free of charge.

JOIN THE FUN FROM ACROSS THE COUNTRY

- Host a Satellite Event in your community! Festival organizers are encouraging schools, colleges, science clubs, and other organizations across the country to host Satellite Events in their communities the same weekend that hundreds of thousands of people will celebrate science on the National Mall. Satellite Events can be as small or as big as you want. They range from a single activity to a fully-fledged Festival. They include science family days, contests, workshops, lunch with a scientist, a science scavenger hunt, or whatever you want it to be—as long as it is educational, fun, science-related, and free to the general public! Satellite Events are being planned in California, Arizona, Florida, New Jersey, North Carolina and many other communities. If you are interested in hosting a Satellite Event, please email rkiefer@mindspring.com.
- Create a "Science is so Cool!" video. The USA Science & Engineering Festival nationwide video contest challenges K–12 students to create a short video that explores the question "Why is Science Cool?" Videos might explore a scientific concept, show us the wonders of nature, give us a glimpse into the future, show us what scientific discovery

has done for us in the past or will do for us in the future, or simply show us why we should care about science. The winning videos will be screened during the USA Science & Engineering Festival Expo on the National Mall and at other Festival events.

- Have lunch with a Laureate! The nationwide Lunch with a Laureate program is a rare opportunity for a small group of middle and high school students to engage in an informal conversation with a Nobel Prize-winning scientist over a brown bag lunch.

For more information about the Festival and how you and your students can get involved, visit www.usasciencefestival.org.

Curriculum in Action

Computer Science and Games: Just for Girls!

Gail Carmichael

It is my passion to show middle and high school girls that stereotypes of computer scientists are inaccurate and that computer science (CS) might be the perfect career for them. To achieve these goals, I've offered a week-long mini-course for gifted eighth grade girls since 2008 as part of the Enrichment Mini-Course Program offered at local colleges and universities near Ottawa, Canada.

My course, *Computer Science and Games: Just for Girls*, attracts students with the promise of learning about games, and taps that enthusiasm to teach CS concepts. Each morning attendees participate in short lectures, group activities, and discussions. During the afternoons, they work on game projects in the computer lab.

Several free game development tools including Game Maker, Scratch, and Alice are ideal for teaching CS with game development. I've have used Game Maker for its graphical drag-and-drop environment. Students are able to make small but complete games within the week with self-directed tutorials. This year I might use Scratch, another free resource that supports a community of young people who post their Scratch projects online. Posting projects to an audience might encourage the girls to continue programming with Scratch after the course.

The software tools are able to support large projects and complex CS concepts. I chose some traditionally challenging topics, and this turned out to be a very good idea. The surveys filled out at the end of the week indicated that the difficult topic of computer graphics was one of the most popular. Difficult concepts are more easily taught when broken down into simple steps and with the direct applications found in game development.

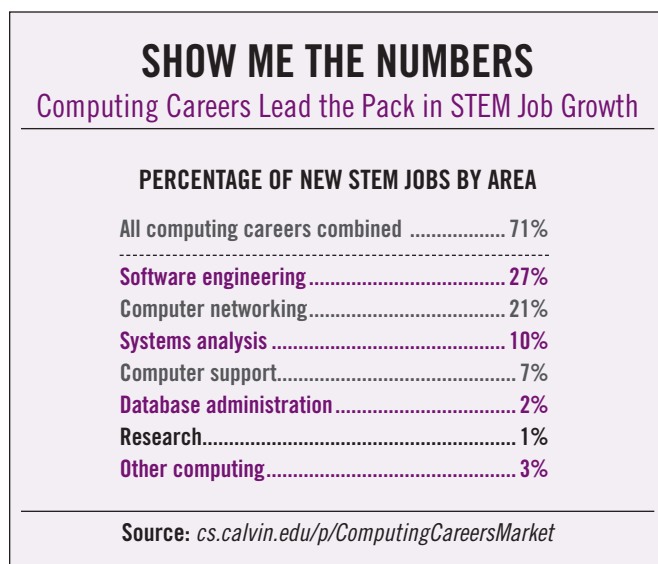
While the material I developed for this course is intended for five five-hour days, it can easily be adapted to a middle or high school schedule. Select the activities and lessons that best align with your course objectives (choosing to use or ignore the games focus) or develop a whole new CS game development unit.

Topics in *Computer Science and Games: Just for Girls* include:

- Introduction
 - What is CS?
 - How does CS fit with other subjects?
 - The connection between games and CS
 - Discussion on women in CS
 - Female gamers & inspiring women
- Game Design
 - How do games entertain?

- Game genres
- Stages of game design
- Game worlds & game play
- Usability
 - Principles of good design
 - Up and coming interfaces
 - Usability and video games
- Computer Graphics
 - Raster vs. vector images
 - Intro to 3D graphics
 - 3D games issues
 - Augmented reality
- Artificial Intelligence
 - AI in games
 - Finite state machines
 - Evolution & the uncanny valley

Visit gailcarmichael.com/mini-course/course-content/ for the course notes and activities.



College Connection

Editor’s note: *This dialog with Dr. Patricia Morreale, Coordinator of the Information Technology (IT) program, and Dr. George Chang, Chair of the Computer Science (CS) Department at Kean University, is a continuation of our series of interviews with CSTA institutional members. Please share with your students these details about the CS programs at Kean University.*

Kean University is located outside of New York City and has a combined undergraduate and graduate enrollment of about 15,000. Kean’s Department of CS and Technology offers B.S. degrees in both CS and information technology (IT). The New Jersey Center for Science, Technology and Math Education is located at Kean and offers a 5-year combined B.S./M.S. program in preparation for advanced scientific research or classroom teaching and certification. Kean’s Nathan Weiss Graduate College offers an Ed.D. degree.

CSTA: What draws students to your program and what keeps them there?

Morreale: Kean’s emphasis on undergraduate teaching assures small class sizes, individual faculty attention, and opportunities for research.

CSTA: What skills can students acquire before college that will help them succeed in your program?

Morreale: Mathematics preparation before college is the best predictor of success in CS and IT. Some experience with programming, such as Java, Alice, or C++, is desired but not required.

CSTA: What cool careers are your graduates prepared for?

Chang: Our students work in areas as diverse as developing new mobile phone applications with Verizon Wireless, cyber investigations and computer forensics with the FBI, and 3D systems simulation and testing for Lockheed Martin.

CSTA: What topics will students study?

Chang: Our undergraduates have the opportunity to take courses in networking, security, new media design (including Flash programming and animation), and foundations of IT using HTML and JavaScript.

CSTA: What distinguishes your school and/or program from others?

Morreale: Our class sizes are limited to a maximum of 20 students and there is a computer for each student in the classroom. Students attend lecture classes and then participate in a hands-on laboratory session. This enables students to show the professors their work, as well as work with peers on programming and laboratory projects. Our immersive, supportive teaching environment provides students with wonderful opportunities to learn not only from their professors, but also from their classmates.

Many of our undergraduates select research projects to pursue with a faculty member in their junior and senior years. This opportunity for independent exploration of a topic outside the classroom has resulted in published research papers and national awards for our students. These accomplishments are highly valued by employers and graduate school admissions committees.

CSTA: Tell us a bit about the social environment of the CS program at Kean.

Morreale: The ACM student chapter at Kean is very active. Recent program events have included presentations from industry and government representatives on topics such as career paths, resume development, and summer internships, as well as alumni panels and a gaming contest. Potential students can learn more about this organization at www.kean.edu/~acm. Small classes ensure good friends and support in the CS and IT program. Students often gather in a reserved student area in the department before or after class for camaraderie and fun.

CSTA: What else is happening at Kean?

Chang: Kean’s central location, outside of New York City, has made it a hub of activity for CS, IT, and education. Kean University is the home of Puma, an NSF-funded supercomputer dedicated to undergraduate research and teaching. Each year Kean hosts the CS and Super Computing day-long teacher workshop (www.kean.edu/~cssc). High school and middle school teachers from the region learn about college expectations for their students and opportunities in computing and technology. They also gather information on arranging for classroom speakers from National Center for Women in Technology (www.ncwit.org) or Shodor (www.shodor.org).



We're on the Web! csta.acm.org

MARK YOUR CALENDAR

ISTE 2010 (International Society for Technology in Education)

June 27–30, 2010 in Denver, Colorado
center.uoregon.edu/ISTE/2010

Project GUTS / Supercomputing Challenge Summer Teacher Institute

July 11–24, 2010 in Socorro, New Mexico
challenge.nm.org/STI

2010 High School Research Program

July 11–30, 2010 in Little Rock, Arkansas
technologize.ualr.edu/?page_id=79

CS & IT Symposium

July 13, 2010 at Google Headquarters, Mountain View, California
www.csitsymposium.org

Carnegie Mellon University CS4HS Summer Workshop 2010

July 26–28, 2010 in Pittsburgh, Pennsylvania
www.cs.cmu.edu/cs4hs/summer10

African-American Women in Computer Science Scholarship Florida Agriculture and Mechanical University

August 1, 2010 deadline
www.cis.famu.edu/~aawcs

Consortium for Computing Sciences in Colleges (CCSC: Midwest)

September 24–25, 2010 in Franklin, Indiana
www.ccsc.org/midwest/Conference

Consortium for Computing Sciences in Colleges (CCSC: Northwestern)

October 8–9, 2010 in Newberg, Oregon
www.ccsc.org/northwest

USA Science & Engineering Festival & Expo

October 10–24, 2010 in Washington, D.C.
Expo on the National Mall, October 23–24
www.usasciencefestival.org

Consortium for Computing Sciences in Colleges (CCSC: Rocky Mountain)

October 15–16, 2010 in Fort Collins, Colorado
www.ccsc.org/rockymt

Consortium for Computing Sciences in Colleges (CCSC: Eastern)

October 15–16, 2010 in Huntingdon, Pennsylvania
projects.juniata.edu/ccsce10/index.shtml

Consortium for Computing Sciences in Colleges (CCSC: Southeastern)

November 12–13, 2010 in Atlanta, Georgia
cs.furman.edu/ccscse

Computer Science Education Week

December 5–11, 2010 in your school
www.csedweek.org

RESOURCES

Here's more information on topics covered in this issue of the *CSTA Voice*.

Page 1: Calvin University CS & Information Systems cs.calvin.edu

Page 1: The Market for Computing Careers cs.calvin.edu/p/ComputingCareersMarket

Page 1: House Resolution 558 thomas.loc.gov/home/gpoxmlc111/hr558_ih.xml

Page 1: CS Education Week www.csedweek.org

Page 1: The Imaginary Worlds Camp alice.calvin.edu/iwc

Page 3: The IT Asset Management Group itamg.com/csta

Page 3: Green Computing Initiative www.cosn.org/Initiatives

Page 4: Phrogram program.com

Page 4: Buzz Off! phrogram.com/media/p/8698.aspx

Page 4: USA Flag phrogram.com/media/p/8549.aspx

Page 5: CSTA Advocate Blog blog.acm.org/csta

Page 5: Computer Science Teacher blogs.msdn.com/alfredth

Page 6: Game Maker www.yoyogames.com/gamemaker

Page 6: Scratch scratch.mit.edu

Page 6: Alice alice.org

Page 6: The Female Perspective of Computer Science compscigail.blogspot.com

Page 6: Gail Carmichael Portfolio gailcarmichael.com/work/minicourse.htm

Page 7: Kean University CS Department www.kean.edu/~compsci

Page 7: NJ Center for Science, Technology & Mathematics Education njcstme.kean.edu

Page 7: NCWIT www.ncwit.org

Page 7: Shodor www.shodor.org

Page 7: CS & Super Computing at Kean University www.kean.edu/~cssc