



Voice

PROFESSIONAL DEVELOPMENT

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

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Won't You Join Us?

We'd Love to Meet You

Join us for the 2008 Computer Science & Information Technology Symposium on Saturday, June 28 at the Marriott Rivercenter Hotel in San Antonio, Texas.

This premier annual CSTA event is the perfect opportunity to grow with friends and colleagues through relevant professional development!

- 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

Just a few of this year's sessions include:

- Toys and Techniques
- Programs, Degrees, and Jobs

- 3D Animation with Alice
- Clubs, Camps & Competitions
- Tips for Teaching OOD
- The Political Landscape
- The GridWorld AP Case Study
- Incorporating Student Culture in Your CS Classroom
- Computational Thinking

Check out the full program of exciting topics at www.csitsymposium.org.

The cost of registration is \$40 US. The deadline for registration is June 15, 2008. There are a limited number of spaces available and registration will be on a first come, first served basis so register online today!

www.csitsymposium.org

A CSTA Leadership Cohort Formed

Local Impact is the Goal

Gail Chapman

CSTA has been awarded an exciting two-year grant to help computer science (CS) teachers build their leadership skills. Through the grant, a cohort of K-12 teachers will be trained to serve as educational leaders in their respective states. These leaders will develop outreach strategies focused on establishing K-12 CS as an essential academic discipline by addressing key curricular, certification, and professional development issues on the local level.

Forty people from 19 states have been chosen to participate in the leadership-

building program in 2008. Individuals from the remaining states will be invited in 2009. The initial group of participants will begin their work by attending a three-day workshop July 8-10, 2008. This workshop will be rich with activities that focus on the leadership qualities needed for effective advocacy, identifying and building partnerships with appropriate stakeholders, and developing a toolkit of advocacy materials to be used in each state.

Following the workshop, participants will begin implementing outreach plans

**IN THE NEXT
ISSUE OF
THE VOICE**

**Diversifying
CS**

CSTA
wishes to thank
Robb Cutler
CSTA's first President
2005 to 2008

for his dedication and
service to CSTA
and to computer science
education

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A CSTA LEADERSHIP COHORT FORMED

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in their respective states and participating in a cohort online community to share experiences, strategies, and successes. The entire process, incorporating lessons learned from year one, will be repeated with the remaining states during 2009 and 2010.

Participants will be encouraged to work toward organizing local and state chapters of CSTA. These organizations

will receive input and support directly from members of the CSTA Board of Directors and/or from local university faculty as part of a K-12 outreach program. They will meet on a regular basis, and address key issues such as curriculum reform and improving teacher practice through professional development.

Your help is needed to assure the success of establishing K-12 CS as an essential academic discipline. For further information on how to volunteer, contact Gail Chapman (gail.chapman@csta.acm.org).

CyberCivics

Electronic Voting Forges New CS Partners

Jeanna Matthews and Jim Owens

Technology and math courses are commonly selected as opportunities for integrating computer science (CS) into K-12 classrooms, but a new program called CyberCivics has shown that government and social studies courses offer even greater opportunities for introducing students to CS concepts.

There are several key aspects that make CyberCivics a particularly effective method for integrating CS concepts with school government classes.

1. CyberCivics topics are snatched from daily headlines such as reports of problems with electronic voting machines, or proposed legislation that limits liability for companies that provided access to telephone records post 9-11. In our modern world, knowledge of computing is necessary to be a well-informed citizen who can understand

the issues behind these headlines.

2. CyberCivics directly refutes some commonly held myths about CS. For example, students may think that careers in computing mean working alone writing code and not interacting with people or helping to solve important societal problems. CyberCivics illustrates clearly that CS is an excellent choice for students interested in making a difference.
3. CyberCivics reaches substantially larger and more diverse groups of students than are normally reached through technology electives. In our experience, technology classes tend to be smaller and predominantly male, while government classes are required for all students.

We have designed several CyberCivics modules ranging in length from one week

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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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(5 hours) to four weeks (20 hours). Regardless of their length, all modules have three primary components:

- An overview of CyberCivics topics in the news
- Hands-on computing activities
- Information on the job outlook for CS

These components make students aware of the myriad ways in which CS-related technologies impact their daily lives and directly counter another popular CS myth—

We implemented a simple electronic voting system using Python

that jobs are disappearing in the U.S. due to offshoring. We help students explore online material provided by the Bureau of Labor Statistics that project job opportunities in the U.S. for computer scientists, database administrators, software engineers, and computer systems analysts to grow “much faster than average” through 2016.

The bulk of a CyberCivics module is devoted to exploring a specific CyberCivics topic through hands-on computing experiences. In our four-week module, we focused on electronic voting. We implemented a simple electronic voting system using Python and staged a mock election with the ballot question, “Should this class have a final exam?” Although students supervised the elections carefully, the ballot question surprisingly passed by an overwhelming margin.

Students were provided print-outs of the Python source files for the mock voting system and experienced three weeks of simple programming exercises. With this background, the students were able to identify the flaw in the voting software.

We have also developed material for modules focusing on topics such as personal information privacy (medical, consumer, financial, etc.), radio frequency identification (RFID) in retail products or identification documents like passports, and the privacy and security of home and public networks.

CyberCivics has been successfully used to integrate hands-on computing experiences with the study of contemporary social and political issues in the Advanced Placement Government class at Potsdam High School in Potsdam, New York. Some elements of the curriculum have also been used at Norwood-Norfolk High School and Canton High School in St. Lawrence County, New York. Through the K-12 STEM Grant, we are reaching out to high school and middle school teachers throughout St. Lawrence County and we hope to extend CyberCivics into middle school classrooms next fall.

To learn more about about CyberCivics, you can listen to the *CS Snipits* podcast at csta.acm.org/Resources/sub/Podcasts.html. You can also download CyberCivics activities from www.clarkson.edu/projects/cybercivics.

Effective Team Dynamics

Going Beyond the Content of an Assignment

Robert Saldarini

Group projects in the classroom are an excellent way to prepare computer science students for the real world of teamwork but many students find working in groups disheartening. Oftentimes, teachers focus only on the content of their assignments while ignoring the human dynamics associated with group work. Teachers, however, can eliminate many of the roadblocks which hinder group projects by carefully outlining expectations concerning

group behavior and interactions.

Students frequently grimace with disapproval when they are told that they will be required to participate in group assignments. Past experiences have taught them that they periodically “drag dead weight,” are left behind by zealous partners who are so “grade intense” they monopolize all aspects of the project, or they waste hours waiting for team members who fail to show up for appointed meetings. For this



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The editorial board of the *CSTA Voice* is dedicated to ensuring that this publication reflects the interests, needs, and talents of the CSTA membership. Please consider sharing your expertise and love for computer science education by contributing newsletter content.

Potential writers for the *CSTA Voice* should send a brief description of the proposed article, estimated word count, statement of value to members, author's name and brief bio/background info, and suggested title to the editor at: cstapubs@csta.acm.org. The final length, due date, and title will be negotiated for chosen articles. Please share your knowledge.

Volunteer today!

The *CSTA Voice* welcomes your comments.

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

CSTA ELECTION RESULTS!

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**Next meeting of
the CSTA Board
June 29, 2008
in San Antonio**

EFFECTIVE TEAM DYNAMICS

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reason, teachers need to establish effective working groups that take the classroom culture into consideration.

Often, teachers cannot resist the temptation to balance teams in some way. They try to establish teams within homogenous peer groups, organizing working teams by the students' background, readiness, and age. The reality is, however, that certain teamwork principles can be applied across-the-board with even the most diverse groups.

Teachers need to curb their desire to balance working groups academically in favor of empowering the

students to create their own teams. It is best to schedule a team formation day early in the term or semester, keeping the students aware that on that date they will be given the opportunity to pick their teammates. The teacher should counsel students that once teams are formed members cannot be changed. Locking-in groups limits the possibility of students asking to trade-off members at a later date. The teacher may find that as this deadline approaches, students begin gravitating toward their desired peers. Setting the team creation strategy early on will help to limit any possibility of student disappointment.

Using an odd-person strategy and keeping the groups small can also help prevent teams from imploding. Making each group odd in number immediately prevents students from generating "dead lock" situations. When conflict situations occur, concerns can be easily put to a democratic vote. Although a larger class may require teams of five, three is really the ideal number size for a working group as larger teams tend to promote more socializing and generate more personality conflicts than smaller teams.

A class size evenly divisible by three is the easiest to manage but should there be a stray student, the teacher may ask established teams to enter a lottery for an additional member. If there are two unas-

signed students, the options increase to also include the possibility of a two-member team or a five-member team. When increasing or decreasing the size of a particular team, the scope of the project needs to be adjusted, reflecting the increased person-power, to avoid any unfair advantage.

Allowing students to establish their own teams provides them with both discipline and responsibility. Nonetheless, the teacher must keep students empowered throughout the entire collaborative effort. This can be done by providing the groups with a "right to fire." The "right to fire" comes with some serious responsibilities. In order to exercise this right, the team

When allowed authority to control their own group experience, students gain important experience in negotiation, delegation, and conflict management.

must meet to discuss the shortcomings of a member in question. Should his or her performance not improve, the team then is responsible for taking action. Placing a member on notice should require an email or note to the teacher, with a copy going directly to the student who is the subject of the conflict. The teacher can then meet with the student regarding proper behavior and arbitrate a solution with the group. These kinds of prescribed team-management strategies usually result in the students applying good self-policing tactics because they want to avoid teacher arbitration at all costs.

When allowed authority to control their own group experience, students gain important experience in negotiation, delegation, and conflict management. These necessary skills for today's diverse workforce can be intrinsically incorporated into group assignments at only the cost of weaning students off a traditional parenting paradigm. When the teacher focuses attention on group dynamic principles that lower or eliminate student conflicts, the integrity of their content-based work is highly enriched.

Programmed to Learn

Three Coding Languages for Beginning Students

John Rice

Editor's note: *This is the second of a three-part series on Logo, Scratch, and Alice as introductory programming languages for teaching science, technology, engineering, and math.*

With the emphasis in our schools and curriculum on science, technology, engineering, and mathematics (STEM), educators are always looking out for new sources of instruction that help facilitate the education of our students in these areas. Besides the usual litany of books and educational software, one key area often overlooked is the use of programming languages.

This series of articles focuses on three of the better known programming languages designed specifically for young students. Versions of all three are freely available online, and many books and Web resources have been written supporting their use. This second installment looks at the Scratch programming language.

Scratch

MIT houses the Scratch programming language, which was made possible by a grant from the National Science Foundation (NSF). All NSF projects are required to be made publicly available for free, and so it is with Scratch. Scratch was hatched by Mitchel Resnick and John Maeda at MIT's famous Media Lab, and Yasmin Kafai at the University of California, Los Angeles.

Rather than using command lines, Scratch was designed to allow pre-made "building blocks" to be put together, resulting in the desired outcome. It was also designed to be Web-friendly, so that students could easily share their projects with one another. As time has progressed, work on the project has resulted in a significant number of resources. Step-by-step instructions for creating projects are available, as are video tutorials, reference guides, and the availability of Scratch in

multiple languages besides English.

Scratch's tagline is, "Imagine. Program. Share." Due to its visual appeal, some of the more popular student projects made in Scratch include a variety of video games. Some of these are new in design, and some are imitations of popular ones like Pac-Man. Other projects are reminiscent of Flash-based movies or cartoons.

MIT hosts a public gallery of student projects, with thousands of contributions from students who have learned to program in Scratch. Browsing through the online gallery will leave you somewhat astonished that grade school children are producing such quality work. Students are required to create accounts in order to share their work and comment on the work of others. However, anybody can browse the gallery and "play" the games and movies. Currently, about 33,000 people have signed up for accounts, and the Scratch site hosts around 28,000 projects. Clearly, the public forum nature of hosted projects brings out the best in nascent student programmers.

Scratch uses a variety of visual building blocks that can be manipulated by users. The Lego toy company, which has a history with MIT and the Logo programming language described in the March 2008 issue of the *Voice*, has allowed royalty-free use of a set of images from its toy line in Scratch. A wide support network at MIT is also available for students and teachers, with an active forum and help site. Many teachers across the country have downloaded and used Scratch in their classrooms, and the site also maintains a testimonial page for educators.

To download Scratch and check out the student projects, visit its official page at scratch.mit.edu.

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Meet the Authors

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CSTA Project Coordinator

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University of Toronto, Canada

Sara is the Communications & Liaison Officer at the Department of CS. She works to raise the profile of CS through departmental programs that engage younger students and their teachers.

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Greg served as a member of the CSTA founding board and is a director in the Research, Accountability, and Superintendent's Schools Division in Nevada.

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*Bergen Community College,
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Robert is a Professor of Business and Information Technology with 27 years of teaching experience within both the community college and university.

Classroom Tools

Teaching CS Online

Paul J. Langhals

The success of an online programming course is greatly enhanced when teachers employ a variety of complementary delivery techniques and educational technology innovations. The online teacher's toolbox includes tools and strategies such as tutorials, online audio and video sessions, and technology-enhanced evaluations.

Tutorials

Web tutorials are effective tools for getting students started with the interface of many popular programming environments. Tutorials step students through basic skills and allow them to progress at their own rate and on their own time. Online tutorials for learning a variety of languages and environments are available from the following sources:

Visual Basic / Visual Studio 2005
www.functionx.com/vbnet/index.htm

Visual C++ / Visual Studio 2005
www.visualplusplus.com

Borland BuilderX for C++
www.tenouk.com/BbuilderX.html

Java NetBeans 6.0 Open Source
www.netbeans.org/kb/60/java/profiler-intro.html

Java Eclipse 3.0 Open Source
pages.cs.wisc.edu/~cs302/resources/EclipseTutorial/

Online audio and video

It is very important for teachers to connect directly to students to answer their questions and to guide them through code samples. Elluminate is a tool specifically designed for online courses and is available through Blackboard course development services. It integrates both live streaming audio and video into an online chat. An audio chat feed enables students to easily and quickly ask questions throughout a lesson. Teachers can further integrate tools through Elluminate by showing slide presentations and using a whiteboard. These integrated technologies enable teachers to deliver information and demonstrate techniques through a customized Web tour created uniquely for their course.

Debuggers

Mastering the use of a debugger takes time and practice, but it is a valuable skill for students to acquire if they are to become skilled programmers. Lessons on effective debugging strategies would include setting break points, stepping through the code, and watching changing variable values. It is important that students thoroughly understand how a debugger functions and how it can be used to solve programming problems.

In an online session, it is often helpful to display a chat window and a debugger window side-by-side, creating an integrated session. Even the most difficult programming concepts can be illustrated with the use of a debugger within the development environment. Most high-level compilers and integrated development environments have debuggers with online and textbook tutorials readily available. Debugger tutorials available online include:

Visual Basic / Visual Studio 2005
www.homeandlearn.co.uk/NET/nets5p1.html

Visual C++ / Visual Studio 2005
www.cs.iit.edu/~resource/supporting/vc/vc_debug.html

Java NetBeans 6.0 Open Source
www.fsl.cs.sunysb.edu/~dquigley/cse219/

Java Eclipse 3.0 Open Source
www.fsl.cs.sunysb.edu/~dquigley/cse219/

Evaluating Student Achievement

Regular evaluations are necessary in an online programming course. Quizzes promote student progress by motivating them to keep up with the readings, tutorials, and chats. In the online environment, teachers can verify individual student achievement by randomly timing quizzes, randomizing questions, and setting time limits. They can also validate achievement using a Web-cam with Elluminate or with one of the free online video chat utilities like Yahoo Messenger or AOL Instant Messenger. A Web-cam also allows the instructor to monitor students as they take quizzes and tests.

An online programming course presents unique challenges for presenting material, guiding student learning, gathering feedback, and assuring student success. Fortunately, technology offers solutions to many of those challenges.

Equity Initiatives

Gr8 Designs for Gr8 Girls

Sara Franca

Gr8 Designs for Gr8 Girls is a University of Toronto project that introduces female 8th grade students to the exciting world of computing.

The program, which began in April 2007 at the university's Department of Computer Science, engaged 22 girls from 12 high schools for a day exploring computer science (CS) careers. Michelle Craig, a senior lecturer in the department and coordinator of the day, noted, "We suspect that many girls are opting out of mathematical careers by making choices based upon career stereotypes that aren't necessarily correct. Gr8 Designs for Gr8 Girls allows young girls to learn a little about CS and discover that they might enjoy working in this exciting field."

With support from the Faculty of Arts and Science and Google Inc., Craig created projects that gave the girls a first look at basic programming skills. Throughout the day, the girls worked with graduate students and faculty members, writing programs using Python, playing a hands-on programming simulation game, and creating their own animated stories with Alice 2.0.

One particular highlight of the day was a tour of the Bahen Centre for Information Technology, which included a visit to the Dynamic Graphics Project (DGP) lab. In the DGP lab, the girls had a chance to see students and faculty working in fields such as human-computer interaction and to use some state-of-the-art equipment.

"The girls had a blast discovering that CS can be fun," Craig said. "Every single participant said that she would encourage a friend in the 7th grade to attend next year."

Those interested in the program can contact the department at gr8girls@cs.toronto.edu.

Visit www.news.utoronto.ca/bulletin/Current_Issue/05_08_07.pdf for a university report on the project.

Bits and Bytes

CS Snippets

In an effort to provide additional opportunities for members to keep tuned-in and up-to-date, CSTA has assembled a collection of podcasts called *CS Snippets*. Through these recordings, teachers can listen-in on interesting conversations with leaders and practitioners in the computer science (CS) field. These podcasts feature educators, industry folks, and students who are willing to chat with us about their passions. The topics in the collection include career opportunities, AP GridWorld, teaching about privacy, using game development to motivate students, CS Fairy Tales, teaching strategies, recruitment and retention tactics, and more. There are over 35 audio recordings currently available with more to be added soon. The MP3 files range from 4 to 9 minutes and can be listened to online or saved to a computer or MP3 player to be listened to at a later time. Feel free to download and share them with your colleagues and students. csta.acm.org/Resources/sub/Podcasts.html

CS Education Day

Mayor Buddy Dyer of Orlando, Florida proudly proclaimed December 7, 2008 as Computer Science Education Celebration Day. The movement to have computer science (CS) recognized with such flair is the brain-child of CSTA Board member Brian Scarbeau. Brian picked December 7th in honor of the birthday of Grace Murray Hopper to celebrate both the contributions of CS education and the contributions of women to today's computing. For more details about having a Computer Science Education Celebration Day declared in your community, visit sws.lhps.org/computerscienceday.

Girls Camp in Ithaca

Plans are now underway for a second Girls and Technology Summer Camp in Ithaca, New York, and organizers hope that this experience will help reverse the serious under-representation of women in information technology careers. The Tompkins-Seneca-Tioga Board of Cooperative Educational Services (TST BOCES) camp will be held July 14-18 for girls entering the eighth grade at Newfield, Ithaca, South Seneca, Trumansburg, Dryden, Groton, Lansing and Candor middle schools. The five-day program includes basic Web design, personal computer components, game making, digital photography, and Global Positioning Systems. Women professionals from the community are also invited as guest speakers to share how technology impacts their jobs daily. The deadline to apply is Friday, June 13, 2008. Applications can be obtained at area middle schools or from Penny Carpenter at pcarpenter@tstboces.org.

Our Story

UNLV Takes Steps to Address Issues in CS Certification Greg Halopoff

For the last two decades, the University of Nevada, Las Vegas (UNLV) has offered a course entitled *Methods of Teaching Computer Programming* to help teachers meet state endorsement requirements. Recognizing that methods in teaching computer science (CS) should subsume more than programming, the course was recast last year and effectively delivered under the present title, *Methods of Teaching Computer Science*, during the fall of 2007.

CSTA's published findings on teacher certification requirements for CS K-12 education tell us that 24 states grant a K-12 CS endorsement, 13 require the endorsement to teach high

school CS, and 12 require the endorsement to teach CS in middle schools. Some states require Praxis exams in other disciplines, and individual teacher experiences have raised questions about the validity of requirements in others. Nevada is one of the 13 states requiring a CS endorsement to teach the subject in middle and high school grades. The endorsement calls for instruction in at least two computer languages; methods for teaching the use of a computer, or educational issues involved in the teaching of computers, or both; and the methods for teaching computer programming.

The revised syllabus was inspired by the *ACM Model Curriculum for K-12 Computer Science*, and focuses on the study of research-based practices and methods in the teaching of CS topics. Topics include algorithmic processes and their principles, object orientation and programming, elements of software design and usability, data abstraction and logic structures, and interface design.

The course's strengths are founded in the emphasis on project-based learning (PBL) strategies applied to a Web-based development environment, and topic alignment with cross-sections of the *Model Curriculum* Levels-I, II, III, and IV. Levels-II, III, and IV topic preeminence is by design, as Level-I topics are more widely distributed among other courses in the NCATE accredited teacher preparation program.

UNLV is also extending the online course offering through its department of distance education. The offering will serve to: (1) expand benefits beyond Nevada to all teachers requiring certification in CS, (2) promote systemic change consistent with the mission of the CSTA, and (3) improve CS instruction at the pre-service level.

Despite a wide disparity in requirements from state to state and the clear need for CS certification reform, the requirements still hold—at least for now. Educational policy change is necessary, and through the concerted efforts of CSTA, collaborating universities and state departments of education, CS education can regain the prominence it demands as an academic discipline. The university is now working with the state's department of education to modify endorsement requirements to accept the methods of teaching programming or CS. This first step will reflect the state's need to stay current with trends in CS education, and will be realized by future course offerings under the new title, *Methods of Teaching Computer Science*.

View the detailed course description of the UNLV Methods of Teaching CS at ci.unlv.edu/files/CSTA_Voice_Article_WebRef2.pdf and its alignment to the ACM Model Curriculum for K-12 CS at ci.unlv.edu/files/CSTA_Voice_Article_WebRef1.pdf.

SHOW ME THE NUMBERS THE WINNERS' MEETING PLACE

PROFESSIONALS IN ORGANIZATIONS

Professionals "very satisfied" with their jobs
 Association members 72%
 Non-members 49%

Professionals "very happy" in their lives
 Association members 45%
 Non-members 6%

Membership in professional associations increased 20% since 1974.

SOURCE: William E. Smith Institute for Association Research



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

MARK YOUR CALENDAR

CS & IT Symposium: CSTA's Annual Conference
June 28, 2008 in San Antonio, Texas
www.csitsymposium.org

National Educational Computing Conference 2008 (NECC)
June 29–July 2, 2008 in San Antonio, Texas
center.uoregon.edu/ISTE/NECC2008/program/

Innovation and Technology in Computer Science Education (ITiCSE)
June 30–July 2, 2008 in Madrid, Spain
www.iticse08.fi.upm.es/

Consortium for Computing Sciences in Colleges (CCSC: Midwest)
September 26–27, 2008 in Holland, Michigan
www.ccsc.org/midwest

Consortium for Computing Sciences in Colleges (CCSC: Northwestern)
October 10–11, 2008 in Ashland, Oregon
www.ccsc.org/northwest/2008/

Consortium for Computing Sciences in Colleges (CCSC: Eastern)
October 10–11, 2008 in Frederick, Maryland
cs.hood.edu/ccsce08/

Consortium for Computing Sciences in Colleges (CCSC: Rocky Mountain)
October 17–18, 2008 in Colorado Springs, Colorado
www.ccsc.org/rockymt/

Consortium for Computing Sciences in Colleges (CCSC: Southeastern)
November 7–8, 2008 in Augusta, Georgia
cs.furman.edu/ccscse/

CSTA Institutional Member K-12 Outreach Programs

First Bytes Collaborative Workshop for Computer Science Teachers / CS4HS
July 9–11, 2008 in Austin, Texas
www.cs.utexas.edu/~firstbytes/teachers/index.html

University of Washington - CS4HS Summer Workshop 2008
July 11–13, 2008 in Seattle, Washington
cs4hs.cs.washington.edu/

Math, Science & Leadership Program
July 21–August 15 Univ. of Washington in Tacoma, Washington
Contact: uwtech@u.washington.edu

Carnegie Mellon University - CS4HS Summer Workshop 2008
July 24–27, 2008 in Pittsburgh, Pennsylvania
www.cs.cmu.edu/cs4hs/summer08/index.html

Microsoft DigiGirlz
August 11–15, 2008 in Redmond, Washington
Contact: emilym@microsoft.com

Game Design Afterschool Program
October 2008 Cornell University, New York
Contact: wofford@cs.cornell.edu

RESOURCES

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

Page 1: CS & IT Symposium www.csitsymposium.org

Page 2: CyberCivics activities at www.clarkson.edu/projects/cybercivics

Page 2: *Hacking Democracy* (documentary film) www.hackingdemocracy.com/

Page 2: *Occupational Outlook Handbook* www.bls.gov/oco/home.htm

Page 5: Scratch scratch.mit.edu

Page 6: Gr8 Designs for Gr8 Girls gr8girls@cs.toronto.edu

Page 6: University of Findlay
www.findlay.edu/academics/colleges/cosc/academicprograms/undergraduate/CSCI

Page 6: Elluminate www.illuminate.com/

Page 7: CS Snipits csta.acm.org/Resources/sub/Podcasts.html

Page 7: CS Education Celebration Day sws.lhps.org/computerscienced

Page 7: CS State Certification Requirements, CSTA Certification Report
csta.acm.org/ComputerScienceTeacherCertification/sub/TeachCertRept07New.pdf

Page 7: UNLV Methods of Teaching CS description
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Page 7: UNLV Methods of Teaching CS standards alignment
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CSTA Advocate Blog blog.acm.org/csta/



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