Voice

DIVERSITY

csta

Inside This Issue

IN THE NEXT ISSUE OF THE VOICE
Strategies that Work

A Welcome from the President

Michelle Hutton

It is hard to believe CSTA is nearly five years old. Five years ago, CSTA was just an idea and now we are a maturing organization with over 5,000 members. I'm very proud to serve you as the second CSTA president. I have exciting plans and goals for us to work toward.

Supporting all of our members in their various roles as computer science (CS) educators, at the various stages of their careers, and in their growth as professionals is my most important goal.

Some members are new to teaching or new to CS. Others are seasoned veterans. CSTA recognizes your unique needs and contributions as members. We are dedicated to supporting you in your career and helping you grow as a CS educator.

CSTA is also playing an important role as an advocate for CS education. Our goal is to help people understand the critical role that CS plays in our society and the importance of providing opportunities for students to study and work in this critical field.

The CS teachers I meet who are not already CSTA members are eager to join when I tell them about our organization. But I need your help to continue building our community. Please introduce the CS teachers you meet to the benefits of a CSTA membership and encourage them to join.

Economic sustainability is critical to the success of CSTA. With it comes strength and potential for making a lasting impact on CS education. Meeting this goal will ensure continued success in serving the needs of our members and building a bright future for CS education.

I welcome your ideas and suggestions.

Computer Science Segregation

Missed Opportunities

Jane Margolis and Joanna Goode

Editor's Note: *This is the first of a two-part series on the diversity research of Jane Margolis and Joanna Goode in the Los Angeles Unified School District (LAUSD) that led to the book* Stuck in the Shallow End: Education, Race, and Computing *(MIT Press, 2008). Part 1 focuses on the research. Part 2 will present effective strategies for improving diversity in computer science.*

Computer science (CS) is a field that is increasingly intertwined with today's economic and educational opportunities and yet, we are missing the participation of large segments of our population. This is worrisome both in terms of individual opportunities and the health of the field. The fact that few African Americans, Latino/as, and females are learning the knowledge necessary to enter and excel in the growing number of computing-intensive disciplines and careers is a critical educational and equity issue.

From 2001 to 2004 we conducted

ROAD SHOW SUCCESS

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research in three different schools in the Los Angeles Unified School District (LAUSD). Overall, we found that there are disparities in access and quality of CS learning opportunities throughout the school district and that these disparities commonly fall along socioeconomics and racial lines. Specifically, too often, in low-resourced schools with high numbers of students of color, the CS learning opportunities are scarce. We made a critical distinction here between CS and computer literacy. This distinction is often not made in the schools, and the computing courses that do exist are primarily focused on basic low-level literacy skills. This means that large numbers of students of color are being denied access to the problem-solving, critical thinking skills of CS.

The LAUSD serves 91% students of color, with Latinos and African Americans making up 73% and 8% of the student population, respectively. We interviewed almost 200 students from computing classes and sometimes from the top level mathematics classes. We also interviewed principals, teachers, and counselors; collected data on the CS curriculum and course offerings; and conducted classroom observations.

The three schools we studied extensively were different from each other, and yet each typified types of schools found in LAUSD. The first school we studied was

an extremely overcrowded facility in an industrial area of southeastern Los Angeles with an almost entirely Latino/a student population. The second school was an aerospace mathematics science magnet in western Los Angeles with a predominately African American population. We found that in both of these high-minority schools, there were only introductory computing courses covering basic low-level "cut and paste" skills available. Our third site was a

> Specifically, too often, in low-resourced schools with high numbers of students of color, the CS learning opportunities are scarce.

neighborhood school in a white and wealthy beach community. Half of the school population was students of color who traveled from across Los Angeles to attend this well-funded campus. Unlike our first two schools, students here had opportunities to study CS beyond basic introductory skills; there was a relatively wide array of computing-related courses, including an Advanced Placement CS class. Yet, we soon noticed that even though advanced computing courses were available, very few students of color at the school were enrolled in them.

The research revealed that CS education is a window into many larger educational disparities. Opportunities (or lack of opportunities) to learn CS, are indicative of opportunities (or lack of opportunities) more broadly defined, and are indicative of who is or is not being prepared for the 21st century.

Road Show Success

Planning is Key

Suzanne Menzel

There will be many successful computer science (CS) road shows "on the road" thanks to the Road Show Workshop held in May at Google's Mountain View, California, facility.

Google partnered with CSTA and SIGCSE to sponsor the two-day workshop for 40 outreach veterans and beginners from post-secondary schools across the country to share ideas and to develop plans for executing K-12 CS road show programs that successfully engage students who are traditionally underrepresented in CS.

Successful road shows have similar characteristics. The message focuses on the people in CS: the people who have computing careers, the people who work on teams, the people who are working to solve big, important problems, and the people who support the work being done in other fields like inventing new medicine, designing safer transportation, improving education, and feeding the world. Images and video help tell the story and audience participation is powerful. In a typical road show presentation, college students share their experiences with younger students by describing their classes and college life as a CS student.

The CS road show concept originated with the Women@SCS group at Carnegie Mellon University, and then spread to other schools including Indiana University, Cornell University, University of Illinois at Urbana-Champaign, and the University of Colorado at Boulder. Representatives from these five schools delivered mini versions of their respective road shows to provide a sampling of what works.

Lecia Barker, Senior Research Scientist at NCWIT, shared research-based strategies for recruiting girls to computing. She recommends tapping into specific interests of target audiences; veterinary medicine, environmental conservation, and health related jobs are high on the list of expressed career goals for middle-school girls.

Workshop participants launching new programs created a road show prototype to take home with advice from some of veteran road show producers. Michelle Hutton from the Girls' Middle School shared tips on connecting with K-12 teachers, and Gabriel Cohen from Google demonstrated new ingenious tools for managing program content, building community repositories, and promoting cooperation over competition.

Watch the *Voice* for news of road shows coming to a school near you.

GridWorld

A Tool for All Year

Stacey Armstrong

Teachers agree that a single teaching and learning tool that enables students to reach multiple learning objectives throughout a course is immensely valuable. The Advanced Placement Computer Science (AP CS) GridWorld case study is just such a tool. Teachers can use it from day-one to introduce new topics, enhance prior lessons, engage students, and meet learning objectives.

On the very first day, GridWorld can be used to demonstrate objects and method calls without ever dealing with the com-plexity of writing a single line of code. Due to GridWorld's interactive nature, manipulating the world is as easy as clicking a mouse. Students quickly learn that methods are important and useful as they observe the changing appearance and behavior of the objects they add to the world.

Learning to write code to create objects using Actor and Location classes comes next. It takes very little code to add actors to the world and to store their position. Students gain confidence quickly because

GRIDWORLD

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method calling and parameter passing come naturally in GridWorld.

The Actor class can be used to teach inheritance with a simple override of the ACT method. Students enjoy making new Actors move around the grid and creating new methods that cause events such as explosions. Constructors and instance variables are not yet necessary; students simply focus on mastering a single concept—inheritance.

Decision making is the next concept taught in GridWorld. Students learn to use IF statements to check boundaries and to make Actors "know" how to navigate the grid more effectively. The process is very visual and engaging.

Bug enters GridWorld at this point, bringing new methods and building upon the students' fundamental understanding of inheritance and decision-making. Bug moves around the grid very much like the Actors created in previous units. Students find the movement and action of Bug pretty straight forward because of their experiences with Actors, inheritance, and overriding methods.

The concept of looping is easy to formalize because students have been routinely, and almost without thought, using the "step button" of the GridWorld environment to call the ACT method of each Actor. Creating loops to solve problems in GridWorld is easier than in some other programming environments because the graphical interface allows students to immediately see the results of their efforts.

> Students learn to use if-statements to check boundaries and to make Actors "know" how to navigate the grid more effectively.

Using GridWorld from day-one and throughout the entire school year enables students to develop a solid understanding of basic object instantiation, method calling, inheritance, and decision making in small incremental steps, based upon their personal experiences interacting with a grid, creating Actors, and manipulating elements in a world. The GridWorld case study builds a great foundation for students in the AP CS class and is a wonderful tool that can be used all year long to enhance the learning of all CS students.

Programmed to Learn

Three Coding Languages for Beginning Students

John Rice

Editor's note: *This is the third of a three-part series on Logo, Scratch, and Alice as introductory programming languages for teaching science, technology, engineering, and math. Parts 1 and 2 are available online in the March and April 2008 issues of the* Voice.

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 third installment looks at Alice.

Alice

One of the most heavily funded introductory programming projects, Alice at Carnegie Mellon University (originally at University of Virginia), was designed to encourage non-programmers to become more interested in the field. Aimed primarily at female students and other groups that traditionally have shied away from CS education and careers in programming, Alice is a three-dimensional graphical language specially designed to stimu-

late interest in computer science (CS).

Since the Alice 3D Authoring System received funding from the NSF, like Scratch it is available free of charge. Alice has also garnered a whole host of corporate sponsors, including such technology luminaries as Intel, Microsoft, and Electronic Arts. These companies have a vested interest in seeing more students entering CS as their degree field, and the corporations see Alice as a venue promoting that choice. Alice is popular as a freshman CS component among several universities. Some of the research surrounding the use of Alice has indeed shown an increase of interest in the field among targeted student groups.

Several textbooks have been written on using Alice, and the program is currently available in its 2.0 version. Although popular on college campuses, the program was designed to be used starting with middle school students. Whereas Scratch has a package of images available from the Lego toy company, Alice has a package of images available from *The Sims 2* thanks to software giant Electronic Arts. *The Sims* has long been the highest selling video game series, and its popularity among girls and women makes including images from this game a smart move that is in line with the STEM agenda underlying Alice. The *Alice Gallery* also has a wide variety of pre-made three-dimensional objects that users can place in their programs.

Whereas Logo focuses on understanding geometrical concepts and mathematical problems, and Scratch focuses on building up two-dimensional movies or games, Alice focuses more on providing the tools for creating three-dimensional worlds (e.g., *The Sims*). A few projects are linked on the main Alice site from participating universities where students have built their own 3D environments, although the purpose of the site remains primarily a destination for downloading the code rather than showcasing projects.

To learn more about Alice and download version 2.0 of the program, as well as various images available for use in Alice projects, visit *www.alice.org*.

Conclusion

Since Sputnik, the United States has had an interest in promoting STEM through schools. Although that interest has waxed and waned over the last half century, it is currently high on the radar at state and federal levels. Technology companies are likewise pushing schools and universities to promote STEM courses, as the ongoing need for engineers, programmers and scientists shows no sign of abating.

Fortunately, many of these companies along with the NSF and other government and higher education entities have funded a variety of projects that can be distributed to schools free of charge. The three programming languages discussed in this series of articles (Logo, Scratch and Alice) are suitable for middle and high school use. All three have excellent support networks and freely available resources as well. Check them out, and see if one of them might be suitable for your school.

John Rice serves as technology director for Iola ISD. He can be reached by e-mail at j7r7@hotmail.com

Meet the Authors

Stacey Armstrong
Cypress Woods High School, Texas
Stacey teaches AP CS and is an endorsed AP consultant. He serves as an AP table leader at the AP reading each summer.

Dr. Joanna Goode
*College of Education,
University of Oregon*
Joanna is an assistant professor and previously worked as a mathematics and CS teacher at an urban Los Angeles area high school. Her research examines why so few females and students of color study CS.

Michelle Hutton
CSTA President
Michelle is the new president of CSTA. She was previously CSTA vice president and equity chair. She is the Director of Technology and 8th grade CS teacher at The Girls' Middle School in Mountain View, California.

Jane Margolis
Graduate School of Education and Information Studies, UCLA
Jane is a social science researcher. She focuses her research on social inequities in education and for the last fifteen years has concentrated on the gender and race gap in CS education.

Suzanne Menzel
Indiana University
Suzanne is a Senior Lecturer in CS and the faculty advisor for Indiana University's road show, *Just Be.* She is also a member of the ACM-W working committee.

John Rice
John Rice is an author and speaker specializing in educational technology and instructional gaming. He serves as technology director for a school district in Texas.

Chris Stephenson
CSTA Executive Director
Chris has been the Executive Director of CSTA since it began in 2005.

CSTA Member in the News: Carpenter Rookie of the Year
Congratulations, LUCINDA A. CARPENTER!

Lucinda Carpenter was recently awarded the Secondary "Rookie" Business Teacher of the Year Award at the annual Mountain-Plains Business Education Association Conference.

Carpenter is a secondary business educator at Creede School District in Creede, CO, and has qualified to compete for a national-level award.

The Mountain-Plains Business Education Association represents business educators from a nine-state region which includes Colorado, Kansas, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming in the U.S., and in the Canadian provinces of Saskatchewan and Manitoba.

csta Voice

Podcast Snipits

Listen and Share

PODCAST
Definition: A Web-based audio broadcast
Etymology: i**Pod** + broad**cast**
Example: There are over 30 podcasts in the *CS Snipits* collection on the CSTA Web site on a wide range of topics of interest to computer science (CS) educators.

Editor's note: *In an effort to provide additional opportunities for members to keep tuned-in and up-to-date, we have assembled a collection of podcasts we call CS Snipits. Each Snipit provides a brief overview of an interesting topic or a quick chat with an interesting person. We urge you to visit the CS Snipits, download a file, and share it with your colleagues and students. And we welcome your suggestions for future podcasts topics.*

Michelle Hutton, CSTA President, has several goals for improving diversity in CS and technology and knows that CSTA members have the skills and knowledge to take on the challenge. Listen to her plans for CSTA and her ideas for increasing diversity in the CS classroom.

Richard Tapia from Rice University is the namesake of the Tapia Celebration of Diversity in Computing Conference and is widely recognized for his work in encouraging and supporting underrepresented groups in math, science, and engineering. In our conversation he offers suggestions for building classroom diversity with strategies for making everyone feel welcome.

Take a look at the entire collection. Listen on your computer or download and save to an mp3 player.
(*csta.acm.org/Resources/sub/Podcasts.html*)

Membership News

CS & IT Symposium a Texas-Sized Success
Chris Stephenson

They say that everything is bigger in Texas, and that certainly was the case for the eighth annual Computer Science and Information Technology (CS & IT) Symposium held in San Antonio, June 28, 2008.

This year's CS & IT Symposium attracted 187 educators for a full day of professional development focused on K-12 CS and information technology topics and issues. Teachers came from across the U.S., Canada, and Mexico to connect with their peers, share ideas, explore new interest areas, and learn new and better ways to engage all students in computing.

The Symposium, held just prior to the National Educational Computing Conference (NECC), featured 22 sessions on a variety of topics including diversity in computing, culture in the classroom, innovative teaching, computational thinking, the AP GridWorld case study, game development, and computing in the K-8 classroom. Sessions to introduce teachers to tools such as Google, Alice, Python, and open source were also well attended.

A panel discussion on the diverse pathways that lead individuals into CS was chaired by CSTA President, Michelle Hutton. Panel members included Harold Javid (Microsoft Research), Nina Kim (Google), and Debra Richardson from the Donald Bren School of ICS at the University of California-Irvine.

"The panelists made it very clear that there are many educational options and job opportunities in CS for individuals with diverse interests and skills," said Hutton. "This panel emphasized that it is important for teachers to think outside the box when it comes to identifying and encouraging students who can succeed in CS."

Closing keynote speaker, Maria Klawe, President of Harvey Mudd College in Claremont, California, summed up many of the messages of the day by noting the importance of bringing diverse perspectives and skills to the work of CS. She also suggested that in order to solve the pressing problems of the world, computer scientists must become leaders and leaders must become computer scientists.

The CS & IT Symposium is hosted by CSTA and was generously sponsored by Google, the Intel Foundation, and Microsoft Research. For information regarding sponsorship for next year's event in Washington, DC, contact Chris Stephenson at *cstephenson@csta.acm.org*.

Details on the symposium and speaker presentations are available at *www.csitsymposium.org*.

The College Connection

Auburn University, Auburn, Alabama
Pat Phillips

Editor's note: *This interview with James Cross, Professor of Computer Science and Software Engineering at Auburn University, is the first in a series of interviews with CSTA institutional members. Please share these details about the computer science (CS) programs at Auburn University with your students.*

Auburn University is located in Auburn, Alabama, and has an enrollment of about 30,000. Students can earn a Bachelor of Science degree in CS, a Bachelor of Wireless Engineering degree, and a Bachelor of Software Engineering degree. At the graduate level students can earn a Master of Science and a Master of Software Engineering degree, as well as a Doctorate of Philosophy degree.

CSTA: What draws students to your program and what keeps them there?
Cross: Auburn is a very friendly environment, and we have some of the best faculty and facilities in the Southeast. Our department just moved into the new Shelby Center with state-of-the-art classrooms, teaching labs, and research labs.

CSTA: What skills can students acquire before college that will help them succeed in your program?
Cross: Since we are in a Samuel Ginn College of Engineering and our degree programs are accredited by the Accreditation Board for Engineering and Technology (ABET), our students are required to take the traditional mathematics and science sequences that are required for engineers. Hence, we urge high school students to acquire a solid background in mathematics and science.

A background in programming is always helpful, too. However, we do not assume entering students have had a programming course. Our CS1 and CS2 courses are taught in Java, and we use the jGRASP IDE which was developed and is maintained here at Auburn. It's extremely easy to use and has features that make learning to program an enjoyable experience.

CSTA: What cool careers are your graduates prepared for?
Cross: The types and categories of jobs that Auburn graduates are prepared for are very broad and range from aerospace and defense software development to game development, from network administrator to database administrator, from staff programmer to consult-

ant, and many more. Companies and agencies who hire our graduates include Boeing, Harris, Lockheed, IBM, Microsoft, NASA, NSA, CIA, Northrop Grumman, Raytheon, and many others.

CSTA: What topics will students study?
Cross: The CS curriculum, which leads to the Bachelor of Science in CS degree, provides an excellent preparation for students seeking careers as software professionals and in computing-related fields, as well as for those planning to pursue graduate study. The curriculum builds on a strong foundation in science, mathematics, social sciences, humanities, and CS, with advanced course work in theoretical CS, human-computer interaction, and net-centric computing. Course work ensures that students receive hands-on exposure to a variety of computer systems, tools, and techniques. Elective courses allow students to specialize in core areas of CS such as networking, database systems, computer security, and artificial intelligence.

The focus of the Software Engineering curriculum, which leads to the Bachelor of Software Engineering degree, focuses on the analysis, design, verification, validation, construction, application, and maintenance of software systems.

For more information visit *www.eng.auburn.edu/programs/csse*. Contact: Dr. James Cross *crossjh@auburn.edu*

Bits and Bytes

Celebrating Diversity

The Grace Hopper Celebration
The 2008 Grace Hopper Celebration of Women in Computing will be held October 1-4, 2008, in Keystone, Colorado. The conference is designed to recognize and celebrate the research and career interests of women in computing. Presenters are leaders in their respective fields, representing industrial, academic and government communities. Leading researchers present their current work, while special sessions focus on the role of women in today's technology fields, including computer science, information technology, research, and engineering.

This year's conference celebrates with the theme of "We Build a Better World." Fran Allen, IBM Fellow Emerita and 2006 Turing Award Winner, and Mary Lou Jepsen, Founder and CTO of One Laptop Per Child, will be keynote speakers.

The event is named for Rear Admiral Grace Hopper, known for her work on compilers and for making machines understand ordinary language instructions that led to the development of the business language, COBOL. Learn more about the Grace Hopper Celebration at *gracehopper.org/2008/*.

The Tapia Conference
The Richard Tapia Celebration of Diversity in Computing Conference will be held April 1-4, 2009, in Portland, Oregon. The gathering creates a supportive networking environment for under-represented groups across the broad range of computing and information technology, from science to business, from the arts to infrastructure.

University students are prominently featured in conference activities. The poster session focuses on new and exciting research by university students, and the top three posters in the graduate and undergraduate student categories advance to the ACM Student Research Competition Grand Finals. The Doctoral Consortium is a full-day sounding board to guide and encourage students working on their Ph.D.s. A Robotics Competition tests the skills of student teams in building and programming robots to operate in both virtual and real-world environments. Student scholarships are available.

The Tapia Conference is named for Richard Tapia, a long-time faculty member at Rice University. He has been recognized for his efforts to recruit minority students in science and engineering. Learn more about the Tapia Conference at *tapiaconference.org/2009/*.

Chapter News

Welcome CSTA Oregon

CSTA Oregon, a long-standing local organization supporting K-12 computer science (CS), became the first official CSTA chapter last year and is already setting a high standards for meeting the needs of local teachers and students.

There has actually been a CSTA in Oregon for more than 20 years, but when CSTA was launched at the national level, CSTA OR joined the national organization first as an affiliate and then as an official chapter.

CSTA Oregon President, Ronald Tenison, has ambitious plans for the new chapter. "We are creating opportunities for computer science teachers at all levels to make connections and work together to improve CS education," says Tenison. "This includes providing new curriculum materials, training opportunities, and relationships with other professional organizations."

A CSTA chapter is designed to facilitate discussion of local issues, provide member services at the local level, and promote CSTA membership on the national level. Tenison notes chapter status will add value by helping to build interrelationships with other chapters. He also notes that CSTA OR will be able to use that national voice to help inform and advise local principals, boards, and legislators about CS education policies.

Status as a CSTA chapter provides a number of benefits. CSTA chapters' events are listed in the Voice and CSTA can help chapters identify and contact local CS teachers and university and college CS faculty. A CSTA Chapter Liaison is also available to offer advice and support.

Newly-formed chapters should ideally include local CS teachers and an educational site willing to host regular meetings. Obligations of chapters include having a minimum of 5 members, holding regular membership meetings, a leadership structure, ongoing communication with members, and a formal set of bylaws meeting CSTA requirements. Chapter applications are submitted in writing and chapter status is subject to approval by the CSTA Board of Directors, based on the recommendation of the CSTA Chapter Liaison and Executive Director.

For more information on forming a CSTA Chapter visit *csta.acm.org/About/sub/CSTAChapters.html*.

ETHNICITY OF U.S. AND CANADIAN CS&CE PH.D. RECIPIENTS 2006-07

Nonresident Alien	56%
African-American	1%
Native American	0%
Asian or Pacific Islander	13%
Hispanic	1%
White, Non-Hispanic	27%
Other	3%

SOURCE: *www.cra.org/info/taulbee/ethnicity.html*
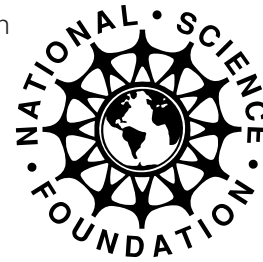
MARK YOUR CALENDAR

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

CSTA sessions:
September 26 Chris Stephenson,
Keynote: The Political Landscape - Advocating for CS

September 27, Fran Trees
Toys and Techniques for Teaching CS

Grace Hopper Celebration of Women in Computing
October 1-4, 2008 in Keystone, Colorado
gracehopper.org/2008/

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/

National Women of Color Technology Awards Conference
October 23-25, 2008 in Dallas, TX
www.womenofcolor.net/v2/index.php

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

Texas Computer Education Association (TCEA) Convention
February 2-6, 2009 in Austin, Texas
www.tcea.org/convention/2009/attendees/Pages/default.aspx

SIGCSE 2009
March 4-7, 2009 in Chattanooga, Tennessee
www.cs.arizona.edu/groups/sigcse09/

Richard Tapia Celebration of Diversity in Computing
April 1-4, 2009 in Portland, Oregon
tapiaconference.org/2009/

NECC 2009
June 28–July 1, 2009 in Washington, DC

CSTA Institutional Member K-12 Outreach Programs

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: Computer Science Teachers Association *csta.acm.org*
Page 1: Road Show Group *groups.google.com/group/roadshowworkshop?hl=en*
Page 1: Bring IT On! *www.cs.indiana.edu/bringiton*
Page 2: Computer Science Equity Alliance *www.apcsla.org/*
Page 2: Teaching to Change LA *tcla.gseis.ucla.edu/divide/about/index.html*
Page 2: Unlocking the Clubhouse *tcla.gseis.ucla.edu/divide/politics/margolis.html*
Page 2: UCLA Graduate School of Education and Information Studies *www.gseis.ucla.edu/*
Page 3: Gridworld *www.collegeboard.com/student/testing/ap/compsci_a/case.html*
Page 3: AP Workshops *www.apluscompsci.com*
Page 4: Alice *www.alice.org*
Page 4: Logo *el.media.mit.edu/Logo-foundation/index.html*
Page 4: Scratch *scratch.mit.edu/*
Page 5: Mountain-Plains Business Education Association *www.mpbea.org/*
Page 6: Snipits Podcasts *csta.acm.org/Resources/sub/Podcasts.html*
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Page 6: NECC 2008 *center.uoregon.edu/ISTE/NECC2008/*
Page 6: Auburn University *www.auburn.edu/*
Page 7: Grace Hopper Celebration *gracehopper.org/2008/about/about-grace-hopper/*
Page 7: Tapia Conference *tapiaconference.org/2009/*