Inside This Issue

**IN THE NEXT
ISSUE OF THE
VOICE**

**CSTA
10th Anniversary**

Biggest and Best Yet!

CSTA Annual Conference

LOCATED ON 250 ACRES at the Pheasant Run Resort in St. Charles, Illinois, the CSTA 2014 Annual Conference will be the biggest and best yet. With ten workshops, twenty-four sessions, and an exhibit hall, attendees will have a plethora of options to meet their professional development needs. Personal fun and relaxation will be abundant also; Pheasant Run offers two 18-hole award-winning golf courses, three pools, a spa/wellness center, a live theater, and a comedy club.

Don't miss the Monday night reception at the new facility of Universal Technical Institute. This is a great opportunity to gather ideas to share with your students about numerous and profitable career opportunities in technology and hear from technical specialists about the latest computer applications in the transportation industry.

The conference lineup features a wide-variety of topics, including computational thinking, AP CS Principles, early-learner Techie Clubs, Artbotics, Turtleart, Ardublock, mobile programming, and game development. A new feature this year includes six 20-minute mini-sessions—the perfect length for "just a taste" of interesting topics such as Big Data, Problets, leveraging budgets, and mobile technology. See the complete conference agenda at: *cstaconference.org*.

In the Tuesday morning keynote, Yasmin Kafai will kick-off the day by examining the role of teachers in introducing programming to a wider array of youth. She will focus on three shifts that will lead educators from computational thinking to computational participation—from code to applications—from tools to communities— ensuring broader participation in computing.

Keynoter Michael Kölling will wrap-up the conference with a lively discourse on what he believes is next for CS education with commentary on and speculation about the future of the discipline, important curricular topics, upcoming software tools, and all the rest.

Do not delay! Register early—workshops have limited capacity, and housing fills up quickly. Conference and workshop registration includes lunch. A discount is offered when purchasing a morning and an afternoon workshop. Online conference registration closes June 26 and housing closes June 13. Find all the details, including local attractions, dining lists, and more detailed information on conference speakers and sessions at *cstaconference.org*. The 2014 CSTA Annual Conference is generously sponsored by Oracle Academy, Microsoft, and Universal Technical Institute.

CSTA ELECTION

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csta.acm.org

Addressing the "Big Data" Standards

Tammy Pirmann

PLEASE JOIN ME in the "Cell Phone Data in STEM" mini-session and the "CS Curriculum Based on the CSTA K–12 Standards" regular session at the 2014 CSTA Annual Conference to learn about using data in the classroom.

The *CSTA K–12 Computer Science Standards* include several learning outcomes that specifically address "Big Data." I have been teaching a local variant of "Computer Science in the Modern World" for many years and have included data analysis from the beginning. Along the way I've gathered useful resources and "lessons learned" from my experiences.

Level 3A, or "Computer Science in the Modern World," includes two standards related to students analyzing both existing data sets and their own.
- Computing Practice and Programming: Describe techniques for locating and collecting small and large-scale data sets.
- Computational Thinking: Compare techniques for analyzing massive data collections.

Finding large data sets online might appear to be a trivial task; however, I would caution any teacher not to initiate an Internet search "live" as this process can be very time consuming. Here are a few collections that I have found useful for the classroom.

Data.gov
Data.gov includes many data sets that are of interest to students, but finding usable sets takes time. I often collect topic ideas from the class and then search the site to locate useful and useable sets. In the past, I have used hate crime statistics, income tax information, census data, campus crime reports, and the ever-popular *"Federal Cost of School Food Program Data."* Use this search strategy to locate data sets: Data.gov → Data → Interactive Data Sets; then filter by "Raw Data" or by "Datasets" (*www.data.gov*).

WolframAlpha
This site is great for on-the-fly data sets and visualizations. Data sets on sports, social networking, and topical issues are abundant. You can download the data, but it tends to be summary or aggregated data, and of limited usefulness unless your students are working on a correlation (such as comparing Olympic medals to the population of the countries that won them). On the plus side, the site includes very nice data visualizations for class discussions (*www.wolframalpha.com*).

Visualizing
Focused primarily on interactive data visualizations, this site is useful when exploring the impact of computing and the Internet on society. The featured section has excellent visualizations of data for discussion and inspiration. Check back often; the site poses topic-based challenges which produce many professional examples you can use with students (*www.visualizing.org*).

Many Eyes from IBM
This portal for data visualizations and data sets contains its own set of brows-

er-based data tools that require some preparation time. Because site visitors can upload their own data sets, I treat this site with caution (*www-958.ibm.com*).

To teach students about different techniques for analyzing data sets, I typically choose a fun topic with many avenues for exploration. My current favorite includes UFO sightings reported to the National UFO Reporting Center (*www.nuforc.org*). I like this data set because it has both structured and unstructured data and provides great fodder for class discussions about data reliability. I allow the students to generate questions, and typically someone will come up with a question that requires linking this data set to some other available data set (such as census). Students can explore a variety of analysis techniques including sorting, filtering, data cleaning, locating outliers and clusters, frequency counts, associations, and distributions.

When assignments require students to create their own data collections, they use one of the many free online tools built for this purpose and then provide a link to the data collection form through their own networks. In many cases, they will post the link to their form on Facebook, Twitter, or Tumblr. In some cases, students may post the link on a community forum or website such as the local Scouts chapter or their favorite gaming guild. Once they have a sufficient number of responses (I use 50 as a minimum) they can begin to analyze the data.

Using telephone technologies creates even more opportunities for gathering and analyzing data from physical phenomena. In another class, students use a cell phone to gather accelerometer data while riding a scaled-down carnival ride built by students in a STEM/engineering class. The students can use the data for the data component of that class, as well as in my CS class. If you do not have access to an engineering class, another way to easily collect similar data is for students to jump rope or do the Macarena with the phone (accelerometer turned on) in a pocket.

I am frequently asked about the tools, software, or languages that students should use for data analysis. I recommend starting where you are. If your lab computers have Excel on them, start there. Students will realize that Excel can only take them so far. My school uses Google Docs, so I start with the Google spreadsheet generated by the form.

How far you go with data analysis is up to you. These topics can carry the class well into programming with data structures, but you don't have to go that far to meet the standards. The collection, analysis, and use of data provide rich opportunities for discussions about access, privacy, piracy, hacking, and the impact of computing on culture and society.

LEARN MORE:

CSTA K–12 Computer Science Standards: csta.acm.org/Curriculum/sub/CurrFiles/ CSTA_K-12_CSS.pdf

Big Data in the Classroom

David Reed

PLEASE JOIN ME in the mini-session "Leveraging Big Data in Introductory Programming" at the 2014 CSTA Annual Conference to learn about public data sets and see examples of using data to invigorate programming assignments.

No topic in computer science (CS) today is hotter than "Big Data." The storage and processing of massive amounts of data to extract useful information is driving the demand for faster computers, expanded storage media, and capable

technology specialists. The news is full of Big Data stories, from the NSA collecting and mining phone and e-mail messages, to companies like Google and Facebook monitoring and analyzing the online behaviors of their customers. Examples such as these can help to motivate students in an introductory programming course, enabling them to apply the programming techniques they are learning to data that is real and relevant to their lives.

The first Big Data

BIG DATA IN THE CLASSROOM
continued from page 3

application in my introductory programming course involves reading in a list of words from a file and processing that list. This is by no means a new idea—many courses do similar tasks with lists of grades or names. What makes this assignment interesting is the expanded Online Scrabble Player's Dictionary (referred to as the "Enable list" at *www.puzzlers.org*), which contains 172,823 English words. Using this massive, public-domain list of words, students are able to pose interesting questions and write simple programs to answer them, such as: "What word

(*NBA.com*) and Major League Baseball (*www.retrosheet.org*) can be good sources of real-world data. Virtually all students can relate to social media, however. The site *infochimps.com* contains a massive (~1.8 GB) file with data on every tweet from 2006 to 2009. This truly is Big Data, as its size makes even viewing the data in its raw form difficult. And since the size of this data set exceeds what most languages can store in a data structure, the students must first tackle the problem of filtering out the data they are interested in. For example, my students wrote functions to

> "How many anagrams are there for the word 'stale'?" Students find answering these kinds of questions much more motivating than toy questions

comes last alphabetically?" "How many five-letter words are there?" "How many anagrams are there for the word 'stale'?" Students find answering these kinds of questions much more motivating than toy questions such as "find the maximum in a list of numbers." In Python, each of these questions can be answered using a single expression (assuming the dictionary words have been read into a list named `dictionary`):

```
dictionary[-1]
len([word for word in
   dictionary if len(word) == 5])
[word for word in dictionary
   if sorted(word) ==
   sorted("stale")]
```

In case you are curious, the last word in the dictionary is "zyzzyvas," there are 8,636 five-letter words, and 'stale' has 10 anagrams.

While CS teachers generally recognize the appeal of Big Data in motivating students, finding large, public data sets in easily accessible formats is not always easy; however, a few data sets are easy to access and motivating to students. While not all students are attracted to sporting examples, sites such as NBA Basketball

read the data file and filter out the data by year and by category (e.g., all hashtags that appeared in 2008). Using their filtered data files, they were then able to mine the Twitter data for trends such as hashtag volume over time and the most popular hashtags by month and by year. This latter task raised interesting historical questions that encouraged students to do additional research. For example, the most popular hashtag from November 2007 to January 2008 was #sixwords, which students found puzzling. Searching the Web, they discovered that a meme exploded across social media during that period, challenging people to write their life story in only six words.

What is striking about these and similar examples is that the code students write is similar to the code they would write using toy data. Counting the number of five-letter words in the English language and counting the number of 90+ grades in a list is basically the same task. However, the size and relevance of the data motivates the students to learn and encourages them to pose further questions. It also exposes them to the power of computers for solving big problems that students couldn't solve by themselves.

The Fruit Guy and Data

Kim Merino

"SERIOUSLY, MS. MERINO, our community is fat and that's because it's in our culture," asserted a jaded Kevin during third period Exploring Computer Science (ECS) class. I proposed to him that we might be able to change this, to which he responded, "How?" I responded confidently, "With our phones."

Data, for many students, conjures up images of test scores, text messages, photos, and "Likes" on social media sites. Data science seems even more foreign to the average teenager. Through lessons found in the *Mobilize* curriculum (authored in part by the University of California, Los Angeles' Center X, and the Center for Embedded Network Sensing) teaching data science opens students' eyes to data that is integral, but often hidden, in their daily lives.

Students can become personally engaged in learning about how data affects their daily lives by becoming "citizen scientists." When students realize that mastering data enables ordinary citizens to create change, they feel empowered to impact social problems such as the negative stereotyping of minorities and obesity.

Equity plays an important part in engaging students in data science. Participatory sensing is defined by *Mobilize* as "an approach to data collection and interpretation in which individuals, acting alone or in groups, use their personal mobile devices and web services to systematically explore interesting aspects of their worlds ranging from health to culture."

Using participatory sensing enables my students to impact their world by recording what they experience with the purpose of discovering useful data that may help spur grassroots community action. Through this process, my students are transformed from passive data miners to engaged and informed citizen scientists. Rather than hoping that governments, politicians, and adults will address community problems, students are called to be proactive participants in a democratic society.

Typically, many of my CS students chalk up community problems to gender, class, and racial stereotypes. Through the use of data science, students are able to identify what factors are really in play. In my ECS class for example, many of my students blamed the obesity problem on Latino traditions of feeding children a diet heavy in fried pork and tortillas. Culture shaming was the easiest and most apparent reaction to the problem. But through the collection of data using mobile phones and an analysis of the data using RStudio, the class was able to conclude that friends were more responsible for the food choices of teenagers and their calorie intake than cultural influence and ethnic foods.

With this new information, the class was empowered to implement change. The class began to draft a plan to incorporate healthier eating habits among teenagers by allowing *el frutero* (the Fruit Guy) vendors, who sell bags of freshly cut fruit flavored with salt and chile, to conduct business on campus. Not only did my students experience a change in their stereotype attitude, but they discovered practical solutions to problems within their own neighborhood! Who would have thought that data science could actually empower teenagers?

In all honesty, data science can be overwhelming and at times, scary. But as with anything in CS, it takes just one lesson to begin unraveling the fears and begin the process of learning, or in this case, relearning, in order to build a better community.

Students can become personally engaged in learning about how data affects their daily lives by becoming "citizen scientists."

Meet the Authors

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Kim Merino is a CS Teacher/Technology Coordinator at the UCLA Community School. She is dedicated to transforming students' beliefs that CS is boring and reserved for only a certain population. She is committed to preparing students of color with the computational skills they need for the 21st Century.

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Tammy is a high school CS teacher and the district K–12 CS Coordinator in Warrington, PA. She has been teaching CS Principles for three years.

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David is the Director of CS and Informatics at Creighton University in Omaha, NE. He has been active in K–12 CS education for more than 20 years.

James Wong
Logical Answers
After working for IBM for over 9 years, James started Logical Answers Corp in 1992 to provide technical services and secure applications that protect clients' data using the standard RSA and AES encryption.

Voice

Member News

New! The CSTA Career and Job Center Fills an Important Need

Over the last year, CSTA has received an increasing number of requests from schools and organizations looking to find computer science (CS) teachers to fill new jobs. At the same time, we've also been receiving requests from teachers who are looking for new job opportunities. To meet the needs of both of these members, CSTA has launched a new job board! The CSTA Career and Job Center (*cstajobs.acm.org*) is the perfect place for job seekers and employers in K–12 CS education to find each other.

Job Seekers
The CSTA Career and Job Center will help you find your next great career opportunity in our searchable database of CS education jobs. Search CS education jobs in academia and industry including: CS teacher, technical coordinator/administrator, curriculum developer, K–12 CS education outreach coordinator, and others. Post your resume, and take advantage of free career tools for job searchers. These services are provided **FREE** to CSTA individual educator members.

Employers
Get started today by creating a company profile, posting your available jobs, and searching resumes to begin your search for an exemplary educator. Employers can choose from the following cost options:
- 30-Day Online Job posting ($190)
- Enhanced 30-Day Online posting ($250)
- Premium 30-Day Online posting ($310)

To access the CSTA Career and Job Center visit: *cstajobs.acm.org* or click the Job Board button from the CSTA homepage (*csta.acm.org*).

Spotlight

CSTA K-12 Standards Help Update CS Licensure in Wisconsin

Andy Kuemmel

Wisconsin is one of the few states to have a distinct license for teachers of computer science (CS) courses in high schools. Teachers in Wisconsin cannot teach CS without this certification. When universities dropped their CS education licensure programs in the early 2000s they made it impossible for districts to hire new teachers to teach CS classes.

To help solve this problem, CSTA-Wisconsin partnered with individuals at Marquette University and the University of Wisconsin-La Crosse who shared our desire to revive CS education in Wisconsin and agreed to write a National Science Foundation (NSF) CE-21 grant with us. We named our consortium PUMP-CS—Preparing the Upper Midwest for Principles of Computer Science. The goal of PUMP-CS is to prepare in-service teachers in Wisconsin to teach the Advanced Placement CS Principles course by the 2016-17 school year and to strengthen the CS teacher community.

Realizing that teacher licensing is a chicken-or-egg problem in Wisconsin, PUMP-CS reached out to the Wisconsin Department of Public Instruction (DPI) to also partner in our CE-21 proposal. We could not rely on training only the existing CS teachers; we knew we needed to create new CS teachers if our plan was going to scale. Involving the DPI was an important decision because when the NSF awarded us the grant, we were then able to ask the DPI to make changes.

In late 2013, a meeting was held with high-level members of the DPI and consultants responsible for professional development in the areas of mathematics, and business and IT education. The goal was to help us update the 1980s CS license requirements to reflect recent changes in how other teaching licenses are granted in Wisconsin. In the 1980s, licenses for academic subjects were based on coursework and hours, not on standards of what teachers should know and be able to do. The DPI team explained to us that if we wanted to put CS on an equal level with other academic subjects, we would need to create standards for teacher knowledge and skills. Their plan is to gather a group of expert CS teachers and teacher educators (just as they do for all other academic subjects) to create the student as well as teacher CS standards. This group of experts will be able to rely upon the *CSTA K-12 Computer Science Standards* as a guide to what Wisconsin students need to know at each grade level.

Once CS standards are adopted in Wisconsin, our PUMP-CS consortium will create an alternative licensure pathway for our cohort participants. The training pathway could be taught through a traditional university or college's school of education or implemented through an organization such as CSTA-Wisconsin.

In case that was not enough to make your heart PUMP-CS, there is even more. Last month, CSTA-WI and PUMP-CS shared with DPI our vision of a Three-year Action Plan that combines these issues and allows CSTA members with CS expertise to help shape the policies that will influence CS education for the next generation of students and educators. The Action Plan includes:
- writing CS standards for students and teachers,
- describing a standards-based path towards CS licensure that any school of education can adopt,
- creating an alternative standards-based path towards CS licensure that PUMP-CS might implement,
- identifying or creating a content test to allow mathematics teachers and possibly other teachers to add a CS license onto their existing license,
- training up to 100 teachers in Exploring Computer Science and Computer Science Principles curricula, and
- finding a way for these teachers to apply our training toward obtaining a CS license.

As CSTA-WI reflects on the past year, we are completely amazed by the dramatic changes that have come about because of the NSF grant and the work by CSTA and other national organizations to promote CS education. We realize that our success is the result of many factors.
- We had a vision in place for several years so we were ready to move when the opportunity presented itself.
- We leveraged our leadership's personal contacts and experiences with people and organizations at multiple levels, including state government, state department of education, state teachers' union, schools of education, CS academia, and national CS education experts.
- We formed a local CSTA chapter to facilitate communication and to present a unified message to politicians and education policy makers.
- We included CSTA and DPI as partners in our successful CE-21 grant proposal.
- We recruited our local CSTA membership in efforts to make it happen.

Research Update

Where Are the CS Teacher Preparation Programs?

Stephanie Hoeppner

With the recent push to increase the number of computer science (CS) courses being taught in K–12 schools, questions are being asked about where all these CS teachers are going to come from. This is difficult to answer, especially in light of the fact that we know so very little about CS teacher preparation programs. To better answer the question, the CSTA Research and Certification Committees have launched a new joint research project to identify institutions currently offering CS teacher preparation programs.

It seems as though no two CS teachers have had the same career trajectory. My personal experience involved a CS Education degree program at Bowling Green State University which was heavy in CS knowledge, but a little short on pedagogy. I was assigned to a math methods course because there were none specifically for CS.

My real preparation for teaching CS, however, came after I entered the classroom with some textbooks in tow. I muddled through the first year and then began to sign up for summer workshops, including Advanced Placement and JETT workshops. Summer classes, more workshops, CSTA conferences, and CSTA resources became my "methods courses." I suspect my story echoes that of many current CS teachers. This is not the most ideal scenario for building a vibrant community of new CS educators. We need a better system to ensure that there is a next generation of CS teachers who are equipped for the job before they arrive in their classrooms.

One of the most common question we get at CSTA is, "How do I find a CS teacher preparation program in my state?" The truth is that we just do not know where these programs exist and what they offer. To address this knowledge gap, CSTA is involved in a two-prong research project.

CSTA has begun by surveying all of the teacher preparation programs in the U.S. to determine if they have a CS education program in place and who can provide information about existing programs. The second step will be to contact these knowledgeable individuals to gather more details regarding their CS teacher preparation programs.

If you have contacts with faculty in teacher preparation programs, please ask them to participate in this research project by completing the survey or by contacting Chris Stephenson (*c.stephenson@csta-hq.org*) if they have not received the survey.

The information CSTA collects will give everyone a clearer answer to the question, "Where are all these CS teachers going to come from?"

Congratulations CSTA Central New Jersey Chapter President Daryl Detrick

Daryl was recognized by the Warren Hills Regional School District as a 2013–14 Outstanding Educator.

Curriculum in Action

The Next Generation of Cyber Warriors

James H. Wong

The U.S. is facing increasing threats from cyber terrorists, putting our computing infrastructure at risk and raising concerns about whether or not our education system is helping students develop the skills needed to work in cybersecurity. This raises the question of what we can do in our high school computer science (CS) classrooms to help our students build these skills. One answer might be to include more cryptography in the curriculum.

Cryptography is one our most powerful weapons against cyber-attacks. Lessons about cryptography and encryption are usually reserved for college students but lessons about how cryptography protects data and simple symmetric algorithms can be taught at the high school level.

A cryptographic *cipher* is the name given to an algorithm for encrypting through a process of substituting a letter for another letter or symbol. The Julius Caesar cipher, developed during the Gallic Wars, is one of the earliest symmetric encryption algorithms. A text message is encrypted by replacing each letter with another in the alphabet sequence. For example, replacing each letter with the third one following it creates the following encryption table.

ORIGINAL	SUBSTITUTE
a	d
b	e
c	f
...	...
y	b
z	c

In this example, the identity of the encryption/decryption key is the character alphabetically three letters away. Using the translation table, the phrase "computer science" would be encrypted as "frpsxwhu vflhqfh." Reversing the technique by substituting the third letter preceding each letter in the coded message breaks the code and decrypts the message.

Teaching high school students to implement the Caesar cipher in Java or other programming languages provides an opportunity to reinforce student learning on strings, arrays, characters, and integers. An array or string can be used to hold the characters of the alphabet. Students can use modulus arithmetic to figure out what letter should follow the letter 'z' and

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SHOW ME THE NUMBERS
Top 10 in number of AP CS-A exams 2013

1	California	4964
2	Texas	3979
3	New York	1858
4	Virginia	1655
5	Maryland	1629
6	New Jersey	1582
7	Illinois	1559
8	Florida	1521
9	Georgia	1261
10	Massachusetts	1067

See more interesting AP statistical comparisons at:
home.cc.gatech.edu/ice-gt/321

THE NEXT GENERATION OF CYBER WARRIORS

continued from page 7

substitute characters at the beginning of the alphabet similarly to the hands of an analog clock sweeping past 12. If modulus arithmetic is too difficult, students can use two separate arrays or strings to hold the alphabet and the translated alphabet so that encryption and decryption techniques involve a simple lookup technique. There are numerous alternative techniques but the beauty is that encryption requires the use of many CS skills.

A cryptography model could also be used to give a context for lessons on ethics and issues related to ensuring individual privacy and protecting confidential data. Students typically share much more personal information than they should. An awareness of the potential dangers, knowledge about encryption, and the skills necessary to exchange protected files can encourage them to be more responsible users.

Careers in cryptography are numerous in public and private industries. The U.S. National Institute of Standards and Technology (NIST) utilizes cryptography experts to work on computer security projects. NIST, in partnership with private industry, recently approved a new digital signature algorithm. The National Security Agency (NSA) funded scholarships in the Maryland Cyber Challenge to recruit future "Cyber Warriors."

Private firms that seek government contracts are also looking for cryptography and security talent. Industries such as banking, insurance, and telecommunications employ cryptographers to protect their data. The need for cyber experts with cryptography skills will continue to grow as government and businesses seek to protect data and reduce identity theft.

October is National Cyber Security Awareness Month. On the Department of Homeland Security website (*www.dhs.gov/ national-cyber-security-awareness-month*) you will find topics and teaching resources. Additional ideas are available at *www.staysafeonline.org/teach-online-safety*.

LEARN MORE:
Hook, David. (2005). *Beginning cryptography with Java*. Indianapolis, IN: Wiley Publishing.
Java Caesar cipher code *logicalanswers.no-ip.biz/LaWebPages/ LaHomePage.jsp*
NIST Computer Security Division *www.nist.gov/itl/csd/index.cfm*
Singh, Simon. (1999). *The Code Book*. New York, NY: Doubleday.

MARK YOUR CALENDAR

Consortium for Computing Sciences in Colleges (Northeastern)
April 25–26, 2014, Providence, Rhode Island
ccscne.org/conferences/ccscne2014

Mobilize Data Science Workshop
April 26, 2014, Raleigh, North Carolina
Contact: Jennifer Albert, *jennifer_albert@ncsu.edu*

Mobilize Data Science Workshop
May 3, 2014, Hot Springs, Arkansas
Contact: Carl Frank, *Carl.Frank@gmail.com*

CSTA Online Election Closes
May 5, 2014

Mobilize Data Science Workshop
May 14, 2014, Owatonna, Minnesota
Contact: Douglas Maine, *dmaine@owatonna.k12.mn.us*

Mobilize Data Science Workshop
May 17, 2014, Hartford, Connecticut
Contact: Chinma Uche, *chinmauche@aol.com*

Mobilize Data Science Workshop
May 24, 2014, Oneonta, New York
Contact: Sen Zhang, *Sen.Zhang@oneonta.edu*

Mobilize Data Science Workshop
May 27, 2014, Berkeley, California
Contact: Sean Morris, *smorris@ausdk12.org*

2014 CSTA Annual Conference
July 14–15, 2014, St. Charles, Illinois
cstaconference.org

Check the most recent CSTA events on the CSTA website
csta.acm.org/ProfessionalDevelopment/sub/TeacherWorkshops.html
List your CSTA event by contacting *l.clayborn@csta-hq.org*

Keep up with CSTA!

The CSTA conference, advocacy efforts, CS education news, chapter events—you name it and you'll find it on Twitter (@CSTeachersA and #csta14), Facebook (Computer Science Teachers Association), and soon, LinkedIn.

Join the conversation with the connection of your choice.

2014 CSTA Annual Conference

July 14–15 in St. Charles, Illinois

cstaconference.org