

## Classroom Tools

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### *Expanding Career Connections*

**Chris Stephenson**

CSTA has created a new “shareable” resource that will help colleges and universities with their computer science (CS) K–12 outreach.

Last year CSTA received a grant from the National Science Foundation Division of Undergraduate Education (DUE) and support from Google to host a workshop to help college and university faculty and staff improve their outreach to K–12 schools. The workshop, which was held at Google headquarters in Mountain View, CA, was focused specifically on helping institutions either begin or improve their CS roadshow presentations. One of the things we discovered, however, was that not all of these outreach programs have the resources to develop professional-quality outreach materials that they can leave with teachers and students, and so we launched upon a solution to create an attractive (professionally-designed) resource that everyone could share.

Directly following the Roadshow workshop, we formed a small volunteer committee to begin working with professional designer Beth Scandalios to design a new “shareable” poster. The committee included Michelle Craig (University of Toronto), Suzanne Menzel (Indiana University), Katie Siek (University of Colorado-Boulder) and Kim Voll (University of British Columbia).

With brainstormed ideas from the committee, Scandalios designed the 36x48” *Computing: Expand Your Connections* poster with the goal of helping students see the many ways in which computing connects people to each other and to the world.

This poster is now available in a variety of forms. CSTA members can request printed copies of the poster directly from CSTA ([cstephenson@csta.acm.org](mailto:cstephenson@csta.acm.org)), or can download the CSTA version to print for themselves. Institutions can also download a customizable pdf that allows them to add their own logo and contact information (using Adobe Acrobat Pro) and then print as many copies as they need to distribute locally.

CSTA President Michelle Hutton notes that in providing this customizable poster, CSTA is making an important statement about working together as a community to promote CS. “The days of isolated complacency about who is and is not interested and engaged in computing are gone” says Hutton, “and it is essential that organizations such as CSTA show that we are willing to work with everyone in the community who cares about encouraging students, especially underrepresented students, to see computing as a viable and engaging educational and career pathway.”

The CSTA and customizable versions of the *Computing: Expand Your Connections* poster can be downloaded from the CSTA website at: [csta.acm.org/Resources/sub/Careers.html](http://csta.acm.org/Resources/sub/Careers.html)

## Out and About the Community

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### *Career Exploration in the Classroom*

You’ll find a wide variety of career posters, brochures and links to enhance your lessons on careers in computing from CSTA ([csta.acm.org/Resources/sub/Careers.html](http://csta.acm.org/Resources/sub/Careers.html)). Here are a few more favorite activities and resources from members of the CSTA Board of Directors.

**Margot Phillipps** (*Auckland, New Zealand*)

Recently the New Zealand Computer Society ([www.nzcs.org.nz](http://www.nzcs.org.nz))

launched an ICT-Connect program to connect professionals with classrooms. Volunteers will interact with students for an hour each week over 4–5 weeks to provide insights and expertise on the diverse and exciting nature of careers in computing. The program is being piloted in Hawkes Bay, Christchurch, and the Wellington region with plans to expand nation-wide.

**Anita Verno** (*Bergen Community College, New Jersey*)

I invite a guest speaker from a computer employment placement firm to provide first-hand details on conducting a successful job or college interview. Topics include dressing and grooming for the interview, preparing to answer typical questions, and creating a well-written resume and cover letter. Stories from a career placement specialist are highly credible with students.

**Barb Ericson** (*Georgia Institute of Technology*)

I recommend the University of Washington’s *Pathways* video to show the breadth of computer science and *A Day in the Life* video series to portray young women with careers in computing ([www.cs.washington.edu/education/ugrad/prospective/outreach.html](http://www.cs.washington.edu/education/ugrad/prospective/outreach.html)).

**Myra Deister** (*Sunny Hills HS, California*)

STEM Transitions ([www.stemtransitions.org](http://www.stemtransitions.org)) offers free integrated lessons including assessment tools and instructor and student materials. Lessons demonstrate the convergence of academic and technical content in STEM-related career clusters.

## College Connection

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### *Cornell University*

**Editor’s note:** *This dialog with Jennifer Wofford (Assistant Dean for Educational Programs at Cornell University’s Computing and Information Science) is a continuation of our series of interviews with CSTA institutional members. Please share with your students these details about the computer science (CS) programs at Cornell University.*

Cornell University is an ivy-league university located in Ithaca, NY, on Cayuga Lake in the Finger Lakes region of Upstate New York. The University has a total undergraduate enrollment of about 14,000 students and an additional 4,500 graduate students. Students can earn a Bachelor of Science (B.S.) or a Bachelor of Arts (B.A.) degree in CS through either the College of Engineering or the College of Arts and Sciences. At the graduate level, students can earn a Master’s of Engineering (M.Eng.) degree, and a Doctorate of Philosophy (Ph.D.) degree.

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

**Wofford:** Students are drawn to the computer science (CS) program at Cornell by the caliber of the CS community, faculty, and students alike. Consistently ranked among the top five CS departments in the U.S., Cornell faculty are recognized around the world as pioneers in their fields. What sometimes sets Cornell CS apart from CS departments at other research universities is the faculty’s commitment to undergraduate education. Tenured professors teach introductory programming classes, as well as develop new courses to teach introductory and advanced CS in innovative ways, including through AI, robotics, and computing in the arts. Students are drawn to Cornell CS because of the outstanding reputation of the faculty, but they remain with CS because of faculty accessibility. Undergraduate students work on faculty-supervised engineering project teams and faculty-supervised independent research, and they have opportunities to work with faculty on grant-funded research projects.

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

**Wofford:** Computing experience is not required. Many of our CS majors never took a CS class before coming to Cornell. Good quantitative skills, on the other hand, are essential.

**CSTA: What cool careers are your graduates prepared for?**

**Wofford:** Cornell CS graduates are highly sought-after by recruiters from companies all over the globe. Many students take advantage of in-year or paid summer internship opportunities in companies like Microsoft, CISCO, Apple, Yahoo!, Amazon, and Google. The career opportunities in CS are varied and span every industry, including finance, energy, defense, healthcare, education, and entertainment.

**CSTA: What topics will students study?**

**Wofford:** All CS students, regardless of their college of admission (Arts vs. Engineering) fulfill the same core curriculum requirements. Additional opportunities for specialization within the major are called 'vectors'. Vectors are CS concentrations selected by individual students based on their personal interests. Students can choose among many options, including: Artificial Intelligence; Computational Science & Engineering; Data-Intensive Computing; Graphics; Human-Language Technologies; Network Science; Programming Languages; Security and Trustworthy Systems; Software Engineering; Systems; and Theory.

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

**Wofford:** Students affiliate with their majors in their sophomore year. Student community in CS is sustained by a strong student association in CS—the Association for CS Undergraduates (ACSU). With the help of CS advising staff, the ACSU coordinates student-faculty luncheons and regular general meetings with faculty and corporate speakers. Much (but not all!) of the classroom work in CS is team project based, so students build collaborative relationships that have been known to span decades.

## Curriculum in Action

### *UW in the High School*

**Stuart Reges**

The trend toward more positive and supportive relationships between post-secondary institutions and K–12 computer science (CS) educators is evidenced in a new program from the University of Washington that fills the need for a more advanced CS course.

When the College Board announced last year that it would no longer be supporting the Advanced Placement (AP) AB exam, many school districts and teachers were left scrambling for a solution that would allow them to continue to support an AB-like

course. In response to this dilemma, the University of Washington (UW) launched the *UW in the High School* program. This program offers Advanced Placement teachers an option for continuing to teach the content of the AP CS AB course by allowing qualified teachers to offer their students a dual enrollment option through which students receive both high school credit and college credit from the University of Washington.

Participating students pay \$275 plus a \$35 registration fee to receive five quarter-units of college credit for the UW CSE143 course, which is the second course in the UW CS curriculum. Students are not required to enroll for UW credit if they are not interested in the dual enrollment option, so it is typical for a teacher to have some students enrolled for dual credit and others taking the course just for high school credit.

The programming assignments and syllabus must be approved. The requirements are fairly flexible because it is recognized that many teachers have developed their own approach to teaching the advanced CS topics. Exams provided by the university will determine the major portion of the grade awarded. Guidance in grading the exams and incorporating homework grades into a UW grade will be provided.

Teachers who are interested in learning more about *UW in High School* can visit [www.cs.washington.edu/homes/reges/uwhs](http://www.cs.washington.edu/homes/reges/uwhs) or contact Shannon Matson ([smatson@extrn.washington.edu](mailto:smatson@extrn.washington.edu)).

## Career Corner

### *10 Reasons to Major in Computing*

1. Computing is part of everything we do!
2. Expertise in computing enables you to solve complex, challenging problems.
3. Computing enables you to make a positive difference in the world.
4. Computing offers many types of lucrative careers.
5. Computing jobs are here to stay, regardless of where you are located.
6. Expertise in computing is valuable in every career.
7. Computing offers great opportunities for true creativity and innovativeness.
8. Computing has space for both collaborative work and individual effort.
9. Computing is an essential part of well-rounded academic preparation.
10. Future opportunities in computing are without boundaries.

Visit [computingcareers.acm.org/](http://computingcareers.acm.org/) for more details on the *Top 10 Reasons to Major in Computing* plus many more great resources to encourage your students to explore careers in computing.

## Survey Winners Announced

**Steve Judd** (Loretto Academy, El Paso, TX) and  
**Jennifer Bond** (Beth Eden Baptist School, Wheat Ridge, CO)

won a Flip video camera for participating in the  
CSTA National High School Computer Science Survey.

The cameras were generously donated by  
**Joe Ross of PureDigital Inc.**

## SHOW ME THE NUMBERS CS Employment Growth 2006–2016

OCCUPATION	% OF CHANGE
Computer software engineers. . . . .	44.6
Computer systems analysts . . . . .	29.0
Network systems/data communications analysts. . . . .	53.4

Compare to other careers.

[www.bls.gov/news.release/ecopro.t05.htm](http://www.bls.gov/news.release/ecopro.t05.htm)