



Association for  
Computing Machinery

*Advancing Computing as a Science & Profession*

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## **SYMPOSIUM EXPLORES THE DRAMATIC GROWTH AND SHIFTING LANDSCAPE OF COMPUTER SCIENCE EDUCATION**

### *Assessment, Collaboration and Diversity Take Center Stage at ACM SIGCSE 2016*

**New York, NY, February 22, 2016** – Computer science education is experiencing meteoric growth at all levels. For US K-12 settings, President Obama recently announced a “Computer Science for All” initiative, a proposal to allocate \$4 billion specifically for computer science education, as well as directing \$135 million already designated to the National Science Foundation (NSF) for computer science teacher training and professional development. “Computer Science for All” was introduced in a welcoming environment, with primary and secondary schools around the world increasingly integrating computer science into the regular curriculum.

At the same time, transformations in computer science education are happening across the learning spectrum. Universities are offering more specialized coursework in an effort to keep up with emerging sub-disciplines. Online learning is becoming increasingly prevalent and research breakthroughs are offering new insights into how people learn computing.

The wide breadth of developments and leading-edge research in the field will be showcased at [ACM’s SIGCSE 2016](#), the Computer Science Education Technical Symposium. More than 1,200 people are expected to attend this year’s event in Memphis, Tennessee from March 2 to March 5.

“There are some immediate challenges that CS educators are dealing with and the SIGCSE 2016 program reflects that,” explains Symposium Co-Chair Jodi Tims of Baldwin Wallace University. “For example, we’ve planned sessions for educators on how to manage steep increases in enrollments as well as peer-to-peer workshops on building diversity in the classroom. While we are addressing the shifting landscape of computer science education, our program also reflects the breadth of the field. There are sessions on topics as diverse as Computational Thinking, Big Data, Engagement and Diversity, Software Testing, Security, CS Principles, K-12 Teaching and CS Education Research.”

Because a new AP Computer Science Principles test and corresponding coursework will be launched this year, the SIGCSE 2016 program includes several offerings for high school teachers who will be on the front lines of implementation. “We have presentations and activities related to AP-CS Principles in essentially every category,” adds Symposium Co-Chair Carl Alphonse of the State University of New York at Buffalo. “Many sessions address AP-CS Principles’ goal of fostering gender and ethnic diversity. In addition to diversity, I think it is fair to say that a focus of the symposium will be the issue of assessment, or what yardsticks educators should use to determine if we are being effective.”

A unique approach to pedagogy that has attracted standing room only attendance in past years, will be back by popular demand. Daniel Garcia of UC Berkeley and David Ginat of Tel Aviv University will offer their workshop “Demystifying Computing with Magic Part III.” Designed for students who are new to computing, Garcia and Ginat use the allure of discovering the hidden secrets of magic as an invitation to computing. They demonstrate magic tricks whose answers are grounded in computing, such as modulo arithmetic, human-computer interfaces, algorithms, binary encoding, etc. With each demonstration, they discuss the underlying computing fundamentals. As with magic tricks, students become readily engaged and are enthusiastic to explain the secrets to others.

The symposium’s awards program will also recognize the impact that ACM SIGCSE members have had on the field. Barbara Boucher Owens, Emeritus Professor of Computer Science at Southwestern University in Georgetown, Texas, will receive the SIGCSE Award for Lifetime Service to the Computer Science Education Community. Boucher Owens, who has been in the computing field since 1967, served as Chair of SIGCSE and has been recognized as an ACM Distinguished Educator. Jan Cuny, a Program Officer at the National Science Foundation (NSF), will receive the SIGCSE Award for Outstanding Contributions to Computer Science Education. During Cuny’s tenure, the National Science Foundation has undertaken several initiatives to recruit, train and provide professional development for computer science teachers in the United States.

## **SIGCSE 2016 HIGHLIGHTS**

### ***Do Students Learn Computing Better When Taught by Their Peers?***

Best Paper Award:

“A Multi-institutional Study of Peer Instruction in Introductory Computing”

This paper details a study by eight authors (Leo Porter, Dennis Bouvier, Quentin Cutts, Scott Grissom, Cynthia Lee, Robert McCartney, Daniel Zingaro, and Beth Simon) investigating use of Peer Instruction (PI) at seven diverse institutions, some R1 (research-focused universities) and others primarily undergraduate institutions (PUIs). The paper highlights differences in the approaches taken, such as how PI is introduced to students, and how much time is allocated to discussion during PI activities. The paper presents interesting results to how well accepted PI is across different schools, and some helpful “do’s and don’ts” for those wanting to adopt PI.

### ***How Does the Human Brain Learn Computing?***

Opening Keynote Address

“Cognitive Load Theory and Computer Science Education”

John Sweller, Emeritus Professor of Educational Psychology, University of New South Wales

Cognitive load theory uses our knowledge of human cognitive architecture to devise instructional procedures, most of which are directly relevant to computer science education. There are several basic aspects of human cognition that are critical to instructional design. First, based on evolutionary educational psychology, cognitive load theory assumes that most topics taught in educational and training institutions are ones that we have not specifically evolved to learn. Such topics require biologically secondary knowledge rather than the biologically primary knowledge that we have evolved to acquire. Second, these instructionally relevant topics require learners to acquire domain-specific rather than generic cognitive skills.

### ***Do Occupations Take on Social Identities Like Gender and Race?***

Closing Keynote Address:

“Lean in to the Evidence: Breaking the ‘Glass Slipper’ of Technical Professions”

Karen Lee Ashcraft, Professor of Communication, University of Colorado at Boulder

Occupations, like individuals, take on social identities such as gender and race. The social identity of an occupation has profound effects, for example, on wages and prestige, degree of professionalization, and ability to recruit and retain diverse populations. Sifting the historical evidence on technical work, Ashcraft develops a new concept—the “glass slipper”—which explains how durable associations between occupations and people arise and how they circulate among us like powerful brands. Despite appearances, this process is neither natural nor determined. It is political, however, revealing a reality more daunting than recent advice to “lean in” suggests. But if the social identities of occupations are strategically constructed, they also can be challenged through creative re-branding.

Click here for a [complete list of SIGCSE 2016 papers and activities](#). Credentialed full-time journalists or professional freelance journalists working on assignment for a major publication or outlet are welcome to attend the conference free of charge. Contact ACM Media Relations Representative Jim Ormond at (212) 626-0505 or email [ormond@hq.acm.org](mailto:ormond@hq.acm.org).

#### **About the SIGCSE Technical Symposium**

The [Technical Symposium](#) is SIGCSE’s flagship conference. It has been held annually in February or March in the United States since 1970. Attendance regularly exceeds 1,200. The symposium provides a diverse selection of technical sessions and opportunities for learning and interaction.

#### **About ACM SIGCSE**

The Special Interest Group on Computer Science Education of the Association for Computing Machinery ([ACM SIGCSE](#)) is a community of approximately 2,600 people who, in addition to their specialization within computing, have a strong interest in the quality of computing education. SIGCSE provides a forum for educators to discuss the problems concerned with the development, implementation, and/or evaluation of computing programs, curricula, and courses, as well as syllabi, laboratories, and other elements of teaching and pedagogy.

#### **About ACM**

ACM, the Association for Computing Machinery ([www.acm.org](http://www.acm.org)), is the world’s largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field’s challenges. ACM strengthens the computing profession’s collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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