

**WEDNESDAY 8:30 AM - 5:00 PM**  
**Pre-Symposium Events (room: TBA in Convention Center)**

**WEDNESDAY 7:00 PM - 10:00 PM**  
**Workshops**

- Workshop #101: CReST-Security Knitting Kit: Ready to Use Teaching Resources to Embed Security Topics into Upper Division CS Courses (room: L1)  
*Ambareen Siraj, Tennessee Tech University*  
*Sheikh Ghafoor, Tennessee Tech University*
- Workshop #102: Making Music with Computers: Creative Programming in Python (room: L2-L3)  
*Bill Manaris, College of Charleston*  
*Tobias Kohn, ETH Zürich*
- Workshop #103: A Web-Based IDE for Teaching with Any Language (room: L5-L6)  
*Dan Armendariz, Harvard University*  
*David Malan, Harvard University*  
*Nikolai Onken, Cloud9*
- Workshop #104: High Yield in the Short Term: Planning Strategically to Get Women into your Major (room: L8)  
*Lecia Barker, University of Texas at Austin*  
*Leisa Thompson, University of Virginia*
- Workshop #105: Guiding Students to Discover CS Concepts and Develop Process Skills using POGIL (room: L9)  
*Clifton Kussmaul, Muhlenberg College*  
*Helen Hu, Westminster College*  
*Chris Mayfield, James Madison University*
- Workshop #106: Engage, Energize and Empower Your Students with Team-Based Learning (room: L10)  
*Lenore Horowitz, University at Albany*  
*George Berg, University at Albany*  
*Kimberly Van Orman, University at Albany*
- Workshop #107: Teaching Parallel Computing Concepts with OpenMP (room: L11-L12)  
*Joel Adams, Calvin College*  
*Richard Brown, St. Olaf College*  
*Elizabeth Shoop, Macalester College*

Workshop #108: Using OpenDSA eTextbooks in Your Class (room: L13-L14)

*Clifford A. Shaffer, Virginia Tech*

*Thomas Naps, University of Wisconsin–Oshkosh*

*Susan Rodger, Duke University*

Workshop #109: Reading and Writing like Computer Scientists: How to Promote Critical Thinking and Student Engagement (room: River Bluff)

*Mark Hoffman, Quinnipiac University*

*Jerod Weinman, Grinnell College*

Workshop #110: Lego-based Case Studies for Teaching Software Engineering (room: Sultana)

*Stan Kurkovsky, Central Connecticut State University*

Workshop #111: Peer Instruction in Computing: a Focus on Student Learning (room: Mississippi)

*Daniel Zingaro, University of Toronto Mississauga*

*Leo Porter, University of California, San Diego*

*Quintin Cutts, University of Glasgow*

*John Glick, University of San Diego*

*Joe Hummel, University of Illinois at Chicago*

*Cynthia Lee, Stanford University*

*Jaime Spacco, Knox College*

Workshop #112: How to launch a STARS Computing Corps cohort to improve retention and broaden participation in computing (room: Cotton Row)

*Jamie Payton, University of North Carolina at Charlotte*

*Tiffany Barnes, North Carolina State University*

### **THURSDAY 8:30 AM - 10:00 AM**

**Plenary Session - Keynote by John Sweller, University of New South Wales**

### **THURSDAY 10:00 AM - 10:45 AM**

**Break & Exhibits**

### **THURSDAY 10:45 AM - 12:00 PM**

Papers: Data Structures (room: L11-L12)

Thu 10:45 AM - 12:00 PM

10:45 AM

Paper vs. Computer-based Exams: A Study of Errors in Recursive Binary Tree Algorithms

*Scott Grissom, Grand Valley State University*

*Laurie Murphy, Pacific Lutheran University*

*Renée McCauley, College of Charleston*

*Sue Fitzgerald, Metropolitan State University*

- 11:10 AM Stay on These Roads: Potential Factors Indicating Students' Performance in a CS2 Course  
*Holger Danielsiek, Westfälische Wilhelms-Universität Münster*  
*Jan Vahrenhold, Westfälische Wilhelms-Universität Münster*
- 11:35 AM BRIDGES: A System to Enable Creation of Engaging Data Structures Assignments with Real-World Data and Visualizations  
*David Burlinson, The University of North Carolina at Charlotte*  
*Mihai Mehedint, The University of North Carolina at Charlotte*  
*Chris Grafer, The University of North Carolina at Charlotte*  
*Kalpathi Subramanian, The University of North Carolina at Charlotte*  
*Jamie Payton, The University of North Carolina at Charlotte*  
*Michael Youngblood, Xerox A PARC company*  
*Robert Kosara, Tableau Software*  
*Paula Goolkasian, The University of North Carolina at Charlotte*

## Papers: Computational Thinking (room: L13-L14)

Thu 10:45 AM - 12:00 PM

- 10:45 AM Computational Thinking as Liberal Studies  
*Dave Mason, Ryerson University*  
*Irfan Khan, Ryerson University*  
*Vadim Farafontov, Ryerson University*
- 11:10 AM A Study on the Impact of Multidisciplinary Collaboration on Computational Thinking  
*S. Monisha Pulimood, The College of New Jersey*  
*Kim Pearson, The College of New Jersey*  
*Diane Bates, The College of New Jersey*
- 11:35 AM Investigating Differences in Wiki-based Collaborative Activities between Student Engagement Profiles in CS1  
*Adam Eck, University of Nebraska-Lincoln*  
*Leen-Kiat Soh, University of Nebraska-Lincoln*  
*Duane Shell, University of Nebraska-Lincoln*

## Papers: Research on Learning (room: L5-L6)

Thu 10:45 AM - 12:00 PM

- 10:45 AM Subgoals Help Students Solve Parsons Problems  
*Briana Morrison, Georgia Institute of Technology*  
*Lauren Margulieux, Georgia Institute of Technology*  
*Barbara Ericson, Georgia Institute of Technology*  
*Mark Guzdial, Georgia Institute of Technology*
- 11:10 AM An Examination of Layers of Quizzing in Two Computer Systems Courses  
*Cindy Norris, Appalachian State University*

- 11:35 AM      As CS Enrollments Grow, Are We Attracting Weaker Students?: A Statistical Analysis of Student Performance in Introductory Programming Courses Over Time  
*Mehran Sahami, Stanford University*  
*Chris Piech, Stanford University*

Papers: Professional Development (room: L2-L3) Thu 10:45 AM - 12:00 PM

- 10:45 AM      TEALS: Teacher Professional Development Using Industry Volunteers  
*Nathaniel Granor, CSNYC/TEALS*  
*Leigh Ann DeLyser, CSNYC*  
*Kevin Wang, Microsoft/TEALS*
- 11:10 AM      Implementation and Outcomes of a Three-Pronged Approach to Professional Development for CS Principles  
*Chrystalla Mouza, University of Delaware*  
*Lori Pollock, University of Delaware*  
*Kathleen Pusecker, University of Delaware*  
*Kevin Guidry, University of Delaware*  
*Ching-Yi Yeh, University of Delaware*  
*James Atlas, University of Delaware*  
*Terry Harvey, University of Delaware*
- 11:35 AM      Deploying Exploring Computer Science Statewide  
*Helen Hu, Westminster College*  
*Cecily Heiner, Southern Utah University*  
*Jay McCarthy, University of Massachusetts Lowell*

Panel (room: Cotton Row) Thu 10:45 AM - 12:00 PM

- How to Use Open Source Software in Education  
*Judith Bishop, Microsoft Research*  
*Carlos Jensen, Oregon State University*  
*Walt Scacchi, University of California*  
*Arfon Smith, GitHub Inc*

Panel (room: Steamboat) Thu 10:45 AM - 12:00 PM

- Rediscovering the Passion, Beauty, Joy, and Awe: Making Computing Fun Again, part 8  
*Daniel Garcia, UC Berkeley*  
*Josh Caldwell, code.org*  
*Pamela Fox, Khan Academy*  
*Jeremy Keeshin, CodeHS*

## Special Session (room: Mississippi)

Thu 10:45 AM - 12:00 PM

The Micro-Cluster Showcase: 7 Inexpensive Beowulf Clusters for Teaching PDC

*Joel Adams, Calvin College**Jacob Caswell, St. Olaf College**Suzanne Matthews, U.S. Military Academy**Charles Peck, Earlham College**Elizabeth Shoop, Macalester College**David Toth, Centre College**James Wolfer, Indiana University, South Bend***THURSDAY 12:00 PM - 1:45 PM****LUNCH: FirstTimer's - SIGCSE Award for Lifetime Service to the Computer Science Education Community****THURSDAY 1:45 PM - 3:00 PM**

## Papers: Pair Programming (room: L11-L12)

Thu 1:45 PM - 3:00 PM

1:45 PM Three Years of Student Pair Programming—Action Research Insights And Outcomes

*Ian McChesney, Ulster University*

2:10 PM Observations of Pair Programming: Variations in Collaboration Across Demographic Groups

*Omar Ruvalcaba, California State University, Northridge**Linda Werner, University of California, Santa Cruz**Jill Denner, Education, Training, and Research*

2:35 PM Teaching Mobile Development with Pair Programming

*Mohammed Seyam, Virginia Tech**Scott McCrickard, Virginia Tech*

## Papers: Engagement and Diversity (room: L13-L14)

Thu 1:45 PM - 3:00 PM

1:45 PM Applying the Communal Goal Congruity Perspective to Enhance Diversity and Inclusion in Undergraduate Computing Degrees

*Bo Brinkman, Miami University**Amanda Diekman, Miami University*

2:10 PM Enhancing Engagement by Balancing Rigor and Relevance

*Sarnath Ramnath, St Cloud state U**John Hoover, St Cloud state U*

2:35 PM      Understanding How Research Experiences for Undergraduate Students May Foster Diversity In The Professorate  
*Burcin Tamer, Computing Research Association*  
*Jane Stout, Computing Research Association*

Papers: CS Ed Research 1 (room: L5-L6)
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Thu 1:45 PM - 3:00 PM
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1:45 PM      A (Updated) Review of Empiricism at the SIGCSE Technical Symposium  
*Ahmed Al-Zubidy, University of Alabama*  
*Jeffrey Carver, University of Alabama*  
*Sarah Heckman, North Carolina State University*  
*Mark Sheriff, University of Virginia*

2:10 PM      An Approach to Enhancing Compiler Error Messages That Seems to Be Effective  
*Brett Becker, University College Dublin*

2:35 PM      Exploration of Students' Keystroke Latencies in an Introductory Programming Course  
*Juho Leinonen, University of Helsinki*  
*Krista Longi, University of Helsinki*  
*Arto Vihavainen, University of Helsinki*

Papers: CS0 (room: L2-L3)
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Thu 1:45 PM - 3:00 PM
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1:45 PM      CS0 for Computer Science Majors at Ohio University  
*Cindy Marling, Ohio University*  
*David Juedes, Ohio University*

2:10 PM      Security Injections 2.0: Increasing Ability to Apply Secure Coding Knowledge using Segmented and Interactive Modules in CS0  
*Sagar Raina, Towson University*  
*Blair Taylor, Towson University*  
*Siddharth Kaza, Towson University*

2:35 PM      Combining "Big Data" and "Thick Data" Analyses for Understanding Youth Learning Trajectories in a Summer Coding Camp  
*Deborah Fields, Utah State University*  
*Lisa Quirke, University of Toronto*  
*Janell Amely, Utah State University*

## Special Session (room: Cotton Row)

Thu 1:45 PM - 3:00 PM

## Training Teachers to Integrate Computational Thinking into K-12 Teaching

*Rania Hodhod, Columbus State University**Shamim Khan, Columbus State University**Yesem Kurt-Peker, Columbus State University**Lydia Ray, Columbus State University*

## Special Session (room: Steamboat)

Thu 1:45 PM - 3:00 PM

## Demystifying Computing with Magic, part III

*Dan Garcia, University of California, Berkeley**David Ginat, Tel-Aviv University*

## Panel (room: Mississippi)

Thu 1:45 PM - 3:00 PM

## Uncommon Teaching Languages

*Mark Lewis, Trinity University**Douglas Blank, Bryn Mawr College**Kim Bruce, Pomona College**Peter-Michael Osera, Grinnell College***THURSDAY 3:00 PM - 3:45 PM****Break & Exhibits****THURSDAY 3:45 PM - 5:00 PM**

## Papers: Big Data (room: L11-L12)

Thu 3:45 PM - 5:00 PM

3:45 PM

VisMap: Exploratory Visualization Support for Introductory Data Science and Visualization

*Dugald Hutchings, Elon University**Megan Squire, Elon University*

4:10 PM

A Practical and Sustainable Model for Learning and Teaching Data Science

*Bina Ramamurthy, University at Buffalo*

4:35 PM

Teaching Big Data with a Virtual Cluster

*Joshua Eckroth, Stetson University*

## Papers: Teaching with Teams (room: L13-L14)

Thu 3:45 PM - 5:00 PM

3:45 PM

Evaluating Student Teams: Do Educators Know What Students Think?

*Anya Tafliovich, University of Toronto Scarborough**Andrew Petersen, University of Toronto Mississauga**Jennifer Campbell, University of Toronto*

- 4:10 PM Teaching Global Software Engineering by Simulating a Global Project in the Classroom  
*Yang Li, Technische Universität München*  
*Stephan Krusche, Technische Universität München*  
*Christian Lescher, Technische Universität München*  
*Bernd Bruegge, Technische Universität München*
- 4:35 PM Exploring Lightweight Teams in a Distributed Learning Environment  
*Stephen MacNeil, University of North Carolina at Charlotte*  
*Celine Latulipe, University of North Carolina at Charlotte*  
*Bruce Long, University of North Carolina at Charlotte*  
*Aman Yadav, Michigan State University*

## Papers: Program Design (room: L5-L6)

Thu 3:45 PM - 5:00 PM

- 3:45 PM Can Students Design Software? The Answer Is More Complex Than You Think  
*Chenglie Hu, Carroll University*
- 4:10 PM On the Interplay Between Bottom-Up and Datatype-Driven Program Design  
*Francisco Enrique Vicente Castro, Worcester Polytechnic Institute*  
*Kathi Fisler, Worcester Polytechnic Institute*
- 4:35 PM Modernizing Plan-Composition Studies  
*Kathi Fisler, Worcester Polytechnic Institute*  
*Shriram Krishnamurthi, Brown University*  
*Janet Siegmund, Universität Passau*

## Papers: Scratch (room: L2-L3)

Thu 3:45 PM - 5:00 PM

- 3:45 PM Initialization in Scratch: Seeking Knowledge Transfer  
*Diana Franklin, University of Chicago*  
*Charlotte Hill, University of California, Santa Barbara*  
*Hilary Dwyer, University of California, Santa Barbara*  
*Alexandria Hansen, University of California, Santa Barbara*  
*Ashley Iveland, University of California, Santa Barbara*
- 4:10 PM ITCH: Individual Testing Of Computer Homework For Scratch Assignments  
*David Johnson, University of Utah*
- 4:35 PM Multi-Track Programming Competitions with Scratch  
*Jason Arnold, Marquette University*  
*Heather Bort, Marquette University*  
*Ryan Naugle, Marquette University*  
*Casey O'Hare, Marquette University*  
*Dennis Brylow, Marquette University*



**Special Session (room: Cotton Row)****Thu 3:45 PM - 5:00 PM****Special Session: ACM Joint Task Force on Cyber Education***Diana Burley, George Washington University**Matt Bishop, University of California, Davis**Elizabeth Hawthorne, Union County College**Siddharth Kaza, Towson University**Lynn Fletcher, Nelson Mandela Metropolitan University***Panel (room: Steamboat)****Thu 3:45 PM - 5:00 PM****Technology We Can't Live Without!, revisited***Daniel Garcia, UC Berkeley**Leslie Aaronson, Forshay Learning Center**Shawn Kenner, Sharon High School**Colleen Lewis, Harvey Mudd College**Susan Rodger, Duke University***Panel (room: Mississippi)****Thu 3:45 PM - 5:00 PM****igniteCS: Addressing Undergraduate CS Retention***Erin Cannon, Google**Priya Chawla, University of Cincinnati**Katherine Lo, University of California, Irvine**Haley Adams, Rhodes College***Special Session (room: L10)****Thu 3:45 PM - 5:00 PM****Instructional Design is to Teaching as Software Engineering is to Programming***Austin Bart, Virginia Tech**Clifford Shaffer, Virginia Tech***BOFS (room: TBA in Marriott Hotel)****5:30 PM - 6:20 PM****BOFS (room: TBA in Marriott Hotel)****6:30 PM - 7:30 PM****THURSDAY 7:30 PM - 8:30 PM****Reception (room: Ballroom A)****FRIDAY 8:30 AM - 10:00 AM****Plenary Session - SIGCSE Award for Outstanding Contribution to Computer Science Education**

**FRIDAY 10:00 AM - 10:45 AM**  
**Break & Exhibits**

**FRIDAY 10:45 AM - 12:00 PM**

**Papers: Peer Techniques (room: L11-L12)**

**Fri 10:45 AM - 12:00 PM**

- 10:45 AM      The Sweep: Essential Examples for In-Flow Peer Review  
*Joe Politz, Brown University*  
*Joseph Collard, UMass Amherst*  
*Arjun Guha, UMass Amherst*  
*Kathi Fisler, Worcester Polytechnic Institute*  
*Shriram Krishnamurthi, Brown University*
- 11:10 AM      The Effects of Peer- and Self-assessment on the Assessors  
*Joonsuk Park, Cornell University*  
*Kimberley Williams, Cornell University*
- 11:35 AM      Differences in the Learning Principles Dominating Student-Student vs. Student-Instructor Interactions while Working on Programming Tasks  
*Alessio Gaspar, University of South Florida*  
*Joni Torsella, University of Cincinnati*  
*Nora Honken, University of Cincinnati*  
*Sohum Sohoni, Arizona State University*  
*Colin Arnold, University of South Florida*

**Papers: Artistic Approaches (room: L13-L14)**

**Fri 10:45 AM - 12:00 PM**

- 10:45 AM      Computational Art - Introducing High School Students to Computing via Art  
*Zoe Wood, California Polytechnic State University*  
*Paul Muhl, Santa Barbara High School*  
*Katelyn Hicks, California Polytechnic State University*
- 11:10 AM      The MoveLab: Developing Congruence between the Self-Concept and Computing  
*Kayla DesPortes, Georgia Institute of Technology*  
*Monet Spells, Georgia Institute of Technology*  
*Betsy DiSalvo, Georgia Institute of Technology*
- 11:35 AM      Creative Computation in High School  
*Dianna Xu, Bryn Mawr College*  
*Aaron Cadle, Fort Worth Country Day School*  
*Darby Thompson, Sidwell Friends School*  
*Ursula Wolz, RiverSound Solutions*

**Papers: Tests and Outcomes (room: L5-L6)****Fri 10:45 AM - 12:00 PM**

- 10:45 AM      Impact of Student Achievement Goals on CS1 Outcomes  
*Daniel Zingaro, University of Toronto Mississauga*  
*Leo Porter, University of California, San Diego*
- 11:10 AM      Introducing and Evaluating Exam Wrappers in CS2  
*Michelle Craig, University of Toronto*  
*Diane Horton, University of Toronto*  
*Daniel Zingaro, University of Toronto Mississauga*  
*Danny Heap, University of Toronto*
- 11:35 AM      Measuring Effects of Modality on Perceived Test Anxiety for Computer Programming Exams  
*Robert Deloatch, University of Illinois Urbana Champaign*  
*Brian Bailey, University of Illinois Urbana Champaign*  
*Alex Kirlik, University of Illinois Urbana Champaign*

**Papers: High School Diversity (room: L2-L3)****Fri 10:45 AM - 12:00 PM**

- 10:45 AM      The role of mentoring as a way to increase girls' participation in CS  
*Jody Clarke-Midura, Utah State University*  
*Vicki Allan, Utah State University*  
*Kevin Close, Utah State University*
- 11:10 AM      Towards More Gender Diversity in CS through an Artificial Intelligence Summer Program for High School Girls  
*Marie Vachovsky, Stanford University*  
*Grace Wu, Stanford University*  
*Sorathan Chaturapruek, Stanford University*  
*Olga Russakovsky, Stanford University*  
*Rick Sommer, Stanford University*  
*Li Fei-Fei, Stanford University*
- 11:35 AM      Sisters Rise Up 4 CS: Helping Female Students Pass the Advanced Placement Computer Science A Exam  
*Barbara Ericson, Georgia Institute of Technology*  
*Miranda Parker, Georgia Institute of Technology*  
*Shelly Engelman, SageFox Consulting Group*

## Panel (room: Cotton Row)

Fri 10:45 AM - 12:00 PM

Future Directions of Block-based Programming

*Neil Brown, University of Kent**Jens Mönig, SAP Labs**Anthony Bau, Phillips Exeter Academy**David Weintrop, Northwestern University*

## Panel (room: Steamboat)

Fri 10:45 AM - 12:00 PM

Why Don't Some CS0 Students Succeed? How Important Are Background, Experience, Culture, Aptitude, Habits and Attitude?

*Daniel Garcia, University of California, Berkeley**Stuart Reges, University of Washington**Colleen Lewis, Harvey Mudd College**Nathan Ensmenger, Indiana University*

## Panel (room: Mississippi)

Fri 10:45 AM - 12:00 PM

Scrum and Agile Methods in Software Engineering Courses

*Jennifer Campbell, University of Toronto**Stan Kurkovsky, Central Connecticut State University**Chun Wai Liew, Lafayette College**Anya Tafliovich, University of Toronto Scarborough*

## Panel (room: L10)

Fri 10:45 AM - 12:00 PM

Engaging CS Alumni from Afar

*Christine Shannon, Centre College**James Kiper, Miami University**Samuel Rebelsky, Grinnell College**Janet Davis, Whitman College***FRIDAY 12:00 PM - 1:45 PM****LUNCH: on your own****FRIDAY 1:45 PM - 3:00 PM**

## Papers: Problem Solving (room: L11-L12)

Fri 1:45 PM - 3:00 PM

1:45 PM

A Course on Programming and Problem Solving

*Swapneel Sheth, University of Pennsylvania**Christian Murphy, University of Pennsylvania**Kenneth Ross, Columbia University**Dennis Shasha, New York University*

- 2:10 PM      The Influence of Problem Solving Abilities on Students' Performance on Different Assessment Tasks in CS1.  
*Alex Lishinski, Michigan State University*  
*Aman Yadav, Michigan State University*  
*Richard Enbody, Michigan State University*
- 2:35 PM      Online CS1: Who Enrols, Why, and How Do They Do?  
*Diane Horton, University of Toronto*  
*Jennifer Campbell, University of Toronto*  
*Michelle Craig, University of Toronto*

## Papers: Novel Learning Approaches (room: L13-L14)

Fri 1:45 PM - 3:00 PM

- 1:45 PM      Just-In-Time Learning for the Just Google It Era  
*Elizabeth Boese Boese, University of Colorado - Boulder*
- 2:10 PM      Hackathons as an Informal Learning Platform  
*Arnab Nandi, The Ohio State University*  
*Meris Mandernach, The Ohio State University*
- 2:35 PM      The Video Collaboratory as a Learning Environment  
*Vikash Singh, University of North Carolina at Charlotte*  
*Sarah Abdellahi, University of North Carolina at Charlotte*  
*Mary Lou Maher, University of North Carolina at Charlotte*  
*Celine Latulipe, University of North Carolina at Charlotte*

## Papers: CS Ed Research 2 (room: L5-L6)

Fri 1:45 PM - 3:00 PM

- 1:45 PM      A Multi-institutional Study of Peer Instruction in Introductory Computing  
*Leo Porter, University of California, San Diego*  
*Dennis Bouvier, Southern Illinois Univ. Edwardsville*  
*Quentin Cutts, University of Glasgow*  
*Scott Grissom, Grand Valley State University*  
*Cynthia Lee, Stanford University*  
*Robert McCartney, University of Connecticut*  
*Daniel Zingaro, University of Toronto, Mississauga*  
*Beth Simon, University of California, San Diego*
- 2:10 PM      Development of a Concept Inventory for Computer Science Introductory Programming  
*Ricardo Caceffo, UNICAMP*  
*Steven Wolfman, University of British Columbia*  
*Kellogg Booth, University of British Columbia*  
*Rodolfo Azevedo, UNICAMP*

2:35 PM      A data-driven analysis of informatively hard concepts in introductory programming  
*Rudolf Wiegand, University of Central Florida*  
*Anthony Bucci, Independent Contractor*  
*Amruth Kumar, Ramapo College of New Jersey*  
*Jennifer Albert, The Citadel*  
*Alessio Gaspar, University of South Florida*

Papers: K-8 Diversity (room: L2-L3)

Fri 1:45 PM - 3:00 PM

1:45 PM      Differentiating for Diversity: Using Universal Design for Learning in Computer Science Education  
*Alexandria Hansen, University of California, Santa Barbara*  
*Hilary Dwyer, Ojai Valley School, Ojai*  
*Eric Hansen, Hope Elementary School, Santa Barbara*  
*Danielle Harlow, University of California, Santa Barbara*  
*Diana Franklin, University of Chicago*

2:10 PM      Empowering All Students: Closing the CS Confidence Gap with an In-School Intervention for Middle School Students  
*Philip Buffum, North Carolina State University*  
*Megan Frankosky, North Carolina State University*  
*Kristy Boyer, University of Florida*  
*Eric Wiebe, North Carolina State University*  
*Bradford Mott, North Carolina State University*  
*James Lester, North Carolina State University*

2:35 PM      How Early Does the CS Gender Gap Emerge? A Study of Collaborative Problem Solving in 5th Grade Computer Science  
*Jennifer Tsan, North Carolina State University*  
*Kristy Boyer, University of Florida*  
*Collin Lynch, North Carolina State University*

Special Session (room: Cotton Row)

Fri 1:45 PM - 3:00 PM

AP Computer Science and Service Learning with We.org  
*Sandy Czajka, Riverside Brookfield High School*  
*Lien Diaz, College Board*  
*Crystal Furman, College Board*

**Panel (room: Steamboat)****Fri 1:45 PM - 3:00 PM**

Booming Enrollments—Survey Data

*Tracy Camp, Colorado School of Mines**Stu Zweben, The Ohio State University**Duncan Buell, University of South Carolina**Jane Stout, Computing Research Association***Special Session (room: Mississippi)****Fri 1:45 PM - 3:00 PM**

Updating Curricular Guidelines for Associate-Degree Computer Science Programs

*Cara Tang, Portland Community College**Cindy Tucker, Bluegrass Community and Technical College**Elizabeth Hawthorne, Union County College***FRIDAY 3:00 PM - 3:45 PM****Break & Exhibits****FRIDAY 3:45 PM - 5:00 PM****Papers: Databases (room: L11-L12)****Fri 3:45 PM - 5:00 PM**

3:45 PM

SQL: From Traditional Databases to Big Data

*Yasin N. Silva, Arizona State University**Isadora Almeida, Arizona State University**Michell Queiroz, Arizona State University*

4:10 PM

chidb: Building a Simple Relational Database System from Scratch

*Borja Sotomayor, University of Chicago - Department of Computer Science**Adam Shaw, University of Chicago - Department of Computer Science*

4:35 PM

Students' syntactic mistakes in writing seven different types of SQL queries and its application to predicting students' success

*Alireza Ahadi, University of Technology Sydney**Vahid Behbood, University of Technology Sydney**Julia Prior, University of Technology Sydney**Arto Vihavainen, University of Helsinki**Raymond Lister, University of Technology Sydney*

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Papers: International Perspectives (room: L13-L14)	Fri 3:45 PM - 5:00 PM
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| 3:45 PM | The Performance of Female Computer Science Students across Three Caribbean Islands<br><i>Daniel Fokum, The University of the West Indies, Mona</i><br><i>Daniel Coore, The University of the West Indies, Mona</i><br><i>Yewande Lewis-Fokum, The University of the West Indies, Mona</i>  |
| 4:10 PM | Alice in the Middle East: An experience report from the formative phase<br><i>Saquib Razak, Carnegie Mellon Univeristy</i><br><i>Wanda Dann, Carnegie Mellon University</i><br><i>Donald Slater, Carnegie Mellon University</i><br><i>Huda Gedawy, Carnegie Mellon University</i>  |
| 4:35 PM | Piloting Computer Science Education Week in Mexico<br><i>Nora Escherle, Ph FHNW</i><br><i>Silvia Ramirez, Department of Computer Science, Tecnol—gico de Monterrey</i><br><i>Ashok Basawapatna, Dept. Mathematics, Computer &amp; Information Science, SUNY, Old Westbury</i><br><i>Carmine Maiello, School of Education, FHNW</i><br><i>Yasko Endo, University of Colorado, Boulder</i><br><i>Alexander Repenning, School of Education, FHNW</i><br><i>Dorit Assaf, School of Education, FHNW</i><br><i>Juan Flores, Department of Computer Science, Tecnológico de Monterrey</i> |

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Papers: Software Testing (room: L5-L6)	Fri 3:45 PM - 5:00 PM
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| 3:45 PM | Testing Strategies for the Automated Grading of Student Programs<br><i>Chris Wilcox, Colorado State University</i>   |
| 4:10 PM | A strategy to combine test-driven development and test criteria to improve learning of programming skills<br><i>Bruno Henrique Pachulski Camara, Faculdade Integrado, Federal University of Technology – Paraná</i><br><i>Marco Aurélio Graciotto Silva, Federal University of Technology – Paraná</i> |
| 4:35 PM | Tool Design and Student Testing Behavior in an Introductory Java Course<br><i>Grant Braught, Dickinson College</i><br><i>James Midkiff, Dickinson College</i>  |



**Papers: CS Principles (room: L2-L3)****Fri 3:45 PM - 5:00 PM**

- 3:45 PM      Lessons Learned from "BJC" CS Principles Professional Development  
*Thomas Price, NC State University*  
*Veronica Catete, NC State University*  
*Jenifer Sharp, NC State University*  
*Tiffany Barnes, NC State University*  
*Dan Garcia, UC Berkeley*
- 4:10 PM      An Experience Report Assessing A Professional Development MOOC For CS Principles  
*Jeff Gray, The University of Alabama*  
*Jonathan Corley, The University of Alabama*  
*Brian Eddy, University of West Florida*
- 4:35 PM      Two Teachers, Two Perspectives on CS Principles  
*Jean Griffin, Temple University*  
*Tammy Pirmann, Gwynedd Mercy University*  
*Brent Gray, Carver Engineering and Science High School*

**Papers: Beale St. Sampler (room: Cotton Row)****Fri 3:45 PM - 5:00 PM**

- 3:45 PM      Seeing Is Believing: Helping Students Visualize Multithreaded Behavior  
*Joel Adams, Calvin College*  
*Patrick Crain, Calvin College*  
*Christopher Dilley, Calvin College*  
*Serita Nelesen, Calvin College*  
*Javin Unger, Calvin College*  
*Mark Vander Stel, Calvin College*
- 4:10 PM      A Survey of Ethical Agreements in Information Security Courses  
*Benedict Chukuka, University of Calgary*  
*Michael Locasto, University of Calgary*
- 4:35 PM      Assessing the Tier-1 Core Learning Outcomes of CS2013  
*James McGuffee, Northern Kentucky University*  
*E, Palmer, MacMurray College*  
*Indira Guzman, Trident University International*

**Panel (room: Steamboat)****Fri 3:45 PM - 5:00 PM**

CS10K Teachers by 2017? Try CS1K+ students NOW! Coping with the Largest CS1 Courses in History

*Daniel Garcia, UC Berkeley*

*Jennifer Campbell, University of Toronto*

*John DeNero, UC Berkeley*

*Mary Lou Dorf, University of Michigan*

*Stuart Reges, University of Washington*

**Panel (room: Mississippi)****Fri 3:45 PM - 5:00 PM**

Panel: Engage in Reasoning with Tools

*Greg Kulczycki, Virginia Tech*

*Murali Sitaraman, Clemson University*

*Nigamanth Sridhar, Cleveland State University*

*Bruce Weide, The Ohio State University*

**FRIDAY 7:00 PM - 10:00 PM****Workshops**

Workshop #301: A Hands-On Introduction to the Internet of Things (room: L1)

*William Siever, Western Illinois University*

*Michael Rogers, Northwest Missouri State University*

*Marshall Strouse, Engineered Audio, LLC*

Workshop #302: Introducing Secure Coding in CS0, CS1, and CS2 (room: L2-L3)

*Blair Taylor, Towson University*

*Siddharth Kaza, Towson University*

Workshop #303: Building on Blocks: Getting Started With Frames in Greenfoot 3 (room: L5-L6)

*Amjad Altadmri, University of Kent*

*Neil Brown, University of Kent*

Workshop #304: Rubricking like a boss: writing and using rubrics for faster, fairer grading of student programs (room: L8)

*Don Blaheta, Longwood University*

*Adrienne Decker, Rochester Institute of Technology*

Workshop #305: Permeating Data Visualization in CS Courses (room: L9)

*Aaron Cadle, Fort Worth Country Day School*

*Ira Greenberg, Southern Methodist University*

*Deepak Kumar, Bryn Mawr College*

*Dianna Xu, Bryn Mawr College*

*Ursula Wolz, RiverSound Solutions*

Workshop #306: Learn CS1/2 by Playing and Building Commercial Grade Casual Games: No Background Required (room: L10)

*Kelvin Sung, University of Washington Bothell*

*Rob Nash, University of Washington Bothell*

*Jason Pace, University of Washington Bothell*

Workshop #307: CSinParallel: Using WebMapReduce to teach parallel computing concepts, hands-on (room: L11-L12)

*Richard Brown Brown, St. Olaf College*

*Elizabeth Shoop, Macalester College*

*Joel Adams, Calvin College*

Workshop #308: MUzECS: Block-based Arduino Programming for Exploring Computer Science (room: L13-L14)

*Dennis Brylow, Marquette University*

Workshop #309: How to Plan and Run Summer Computing Camps - Logistics (room: River Bluff)

*Barbara Ericson, Georgia Institute of Technology*

*Kristine Nagel, Georgia Gwinnett College*

*Nannette Napier, Georgia Gwinnett College*

*Krishnendu Roy, Valdosta State University*

Workshop #310: K-12 Teacher Support for Computer Science Principles: An Introduction to the UTeach Course, Thriving in Our Digital World: AP (room: Sultana)

*Jeff Mickel, The UTeach Institute, The University of Texas at Austin*

*Alicia Beth, The UTeach Institute, The University of Texas at Austin*

Workshop #311: Conducting educational research in the computer science classroom: Choosing the appropriate research design to address your research questions. (room: Mississippi)

*Aman Yadav, Michigan State University*

Workshop #312: AP CS Principles and The Beauty and Joy of Computing Curriculum (room: Cotton Row)

*Daniel Garcia, UC Berkeley*

*Tiffany Barnes, NC State*

*Michael Ball, UC Berkeley*

*Emil Biga, Millard North High School*

*Josh Paley, Gunn High School*

*Marnie Hill, J. H. Rose High School*

*Nathan Mattix, Piedmont High School*

*Parisa Safa, Urban School of San Francisco*

*Sean Morris, Albany High School*

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*Shawn Kenner, Sharon High School*

**SATURDAY 8:45 AM - 10:00 AM****Papers: Computer Engineering (room: L11-L12)****Sat 8:45 AM - 10:00 AM**

8:45 AM Undergraduate Assembly Language Instruction Sweetened with the Raspberry Pi  
*Jalal Kawash, University of Calgary*  
*Andrew Kuipers, University of Calgary*  
*Leonard Manzara, University of Calgary*  
*Robert Collier, Carleton University*

9:10 AM Droning On: Reflections on Integrating UAV Technology into a Computer Engineering Design Laboratory  
*Meriel Huggard, Trinity College Dublin*  
*Ciarán Mc Goldrick, Trinity College Dublin*

9:35 AM Effects of a program integrating course for students of computer science and engineering  
*Viggo Kann, KTH Royal Institute of Technology*  
*Anna-Karin Hägfeldt, KTH Royal Institute of Technology*

**Papers: Out-of-school Activities (room: L13-L14)****Sat 8:45 AM - 10:00 AM**

8:45 AM Meeting graduate employability needs through open-source collaboration with industry  
*Matthew Forshaw, Newcastle University*  
*Ellis Solaiman, Newcastle University*  
*Oonagh McGee, Newcastle University*  
*Hugo Firth, Newcastle University*  
*Paul Robinson, RedHat*  
*Ryan Emerson, RedHat*

9:10 AM Agile Software Development: Study Away  
*Maureen Doyle, Northern Kentucky University*  
*Candace Gibson, Northern Kentucky University*  
*Michelle Melish, Northern Kentucky University*  
*Rees Storm, Northern Kentucky University*

9:35 AM Computer history on the move  
*Graham Farr, Monash University*  
*Barbara Ainsworth, Monash University*  
*Chris Avram, Monash University*  
*Judithe Sheard, Monash University*

## Papers: Classroom Techniques (room: L5-L6)

Sat 8:45 AM - 10:00 AM

- 8:45 AM      Improving Engagement in Introductory Courses with Homework Resubmission  
*Amanda Holland-Minkley, Washington & Jefferson College*  
*Thomas Lombardi, Washington & Jefferson College*
- 9:10 AM      Animated Examples as a Practice Content in Java Programming Course  
*Roya Hosseini, University of Pittsburgh*  
*Teemu Sirkiä, Aalto University, School of Science*  
*Julio Guerra, University of Pittsburgh*  
*Peter Brusilovsky, University of Pittsburgh*  
*Lauri Malmi, Aalto University, School of Science*
- 9:35 AM      Memory Diagrams: A Consistant Approach Across Concepts and Languages  
*Toby Dragon, Ithaca College*  
*Paul Dickson, Ithaca College*

## Papers: Computing in Middle School (room: L2-L3)

Sat 8:45 AM - 10:00 AM

- 8:45 AM      Factors Influencing Computer Science Learning in Middle School  
*Shuchi Grover, Stanford University/SRI International*  
*Roy Pea, Stanford University*  
*Stephen Cooper, Stanford University*
- 9:10 AM      MyCS at 5: Assessing a middle-years CS curriculum  
*Brenda Castro, Harvey Mudd College*  
*Terrence Diaz, Harvey Mudd College*  
*Marissa Gee, Harvey Mudd College*  
*Rebekah Justice, Harvey Mudd College*  
*David Kwan, Harvey Mudd College*  
*Preethi Seshadri, Harvey Mudd College*  
*Zachary Dodds, Harvey Mudd College*
- 9:35 AM      "What Is A Computer?" What do Secondary School Students Think?  
*Shuchi Grover, SRI International*  
*Daisy Rutstein, SRI International*  
*Eric Snow, SRI Interntaional*

## Papers: Games (room: Cotton Row)

Sat 8:45 AM - 10:00 AM

- 8:45 AM      A Multidisciplinary, Multifaceted Approach to Improve the Computer Science based Game Design Education: Methodology and Assessment  
*Chang Yun, University of Houston*  
*Hesam Panahi, University of Houston*  
*Zhigang Deng, University of Houston*

- 9:10 AM      Design Insights into the Creation and Evaluation of a Computer Science Educational Game  
*Britton Horn, Northeastern University*  
*Christopher Clark, Northeastern University*  
*Oskar Strom, Northeastern University*  
*Hilery Chao, Brown University*  
*Amy Stahl, Northeastern University*  
*Casper Hartevelt, Northeastern University*  
*Gillian Smith, Northeastern University*
- 9:35 AM      Experiences from an Experiential Learning Course on Games Development  
*Stephan Krusche, Technische Universität München*  
*Barbara Reichart, Technische Universität München*  
*Paul Tolstoi, Technische Universität München*  
*Bernd Brügge, Technische Universität München*

## Special Session (room: Steamboat)

Sat 8:45 AM - 10:00 AM

## Nifty Assignments

*Nick Parlante, Stanford University*  
*Julie Zelenski, Stanford University*

**SATURDAY 10:00 AM - 10:45 AM****Break & Exhibits****SATURDAY 10:45 AM - 12:00 PM**

## Papers: Security (room: L11-L12)

Sat 10:45 AM - 12:00 PM

- 10:45 AM      The Teaching Privacy Curriculum  
*Serge Egelman, International Computer Science Institute*  
*Julia Bernd, International Computer Science Institute*  
*Gerald Friedland, International Computer Science Institute*  
*Daniel Garcia, University of California, Berkeley*
- 11:10 AM      A Reflective Approach to Assessing Student Performance in Cybersecurity Exercises  
*Richard Weiss, The Evergreen State College*  
*Michael Locasto, University of Calgary*  
*Jens Mache, Lewis and Clark College*
- 11:35 AM      Facilitating a Battle Between Hackers: Computer Security Outside of the Classroom  
*Nathan Backman, Buena Vista University*

**Papers: Alternative Learning Experiences (room: L13-L14)****Sat 10:45 AM - 12:00 PM**

- 10:45 AM      A Programming Contest Strategy Guide  
*Aaron Bloomfield, University of Virginia*  
*Borja Sotomayor, University of Chicago*
- 11:10 AM      Datathons: An Experience Report of Data Hackathons for Data Science Education  
*Craig Anslow, Middlesex University*  
*John Brosz, University of Calgary*  
*Frank Maurer, University of Calgary*  
*Mike Boyes, University of Calgary*
- 11:35 AM      Teaching "Lawfulness" With Kodu  
*David Touretzky, Carnegie Mellon University*  
*Christina Gardner-McCune, University of Florida*  
*Ashish Aggarwal, University of Florida*

**Papers: CS Ed Research 3 (room: L5-L6)****Sat 10:45 AM - 12:00 PM**

- 10:45 AM      Towards a Common Framework for Evaluating Computing Outreach Activities  
*Adrienne Decker, Rochester Institute of Technology*  
*Monica McGill, Bradley University*  
*Amber Settle, DePaul University*
- 11:10 AM      Retention of Flow: Evaluating a Computer Science Education Week Activity  
*Dorit Assaf, School of Education FHNW*  
*Ashok Basawapatna, SUNY Old Westbury*  
*Nora Escherle, School of Education FHNW*  
*Alexander Repenning, School of Education FHNW*  
*Carmine Maiello, School of Education FHNW*
- 11:35 AM      Students' Initial Course Motivation and Their Achievement and Retention in College CS1 Courses  
*Duane Shell, University of Nebraska-Lincoln*  
*Leen-Kiat Soh, University of Nebraska-Lincoln*  
*Abraham Flanigan, University of Nebraska-Lincoln*  
*Markeya Peteranetz, University of Nebraska-Lincoln*

**Papers: K-12 Teaching (room: L2-L3)****Sat 10:45 AM - 12:00 PM**

- 10:45 AM      Landscape of K-12 Computer Science Education in the U.S.: Perceptions, Access, and Barriers  
*Jennifer Wang, Google, Inc.*  
*Hai Hong, Google, Inc.*  
*Jason Ravitz, Google, Inc.*  
*Sepehr Moghadam, Google, Inc.*

- 11:10 AM CS Teacher Experiences with Educational Technology, Problem-Based Learning, and a CS Principles Curriculum  
*George Veletsianos, Royal Roads University*  
*Bradley Beth, The University of Texas at Austin*  
*Calvin Lin, The University of Texas at Austin*
- 11:35 AM Contextualized Teaching in the Lower Secondary Education \* Long-term Evaluation of a CS Course from Grade 6 to 10  
*Arno Pasternak, TU Dortmund*

## Papers: Tools (room: Cotton Row)

Sat 10:45 AM - 12:00 PM

- 10:45 AM Supporting Active Learning by Introducing an Interactive Teaching Tool in a Data Structures and Algorithms Course  
*Tommy Färnqvist, Linköping University*  
*Fredrik Heintz, Linköping University*  
*Patrick Lambrix, Linköping University*  
*Linda Mannila, Åbo Akademi University*  
*Chunyan Wang, Linköping University*
- 11:10 AM SEURAT\_Edu: A Tool to Assist and Assess Student Decision-Making in Design  
*John Malloy, Miami University*  
*Janet Burge, Wesleyan University*
- 11:35 AM Incorporating Ubiquitous Pedagogical Designs in a Computer Science Tutoring System  
*Rachel Harsley, University of Illinois at Chicago*  
*Nick Green, University of Illinois at Chicago*  
*Mehrdad Alizedah, University of Illinois at Chicago*  
*Sabita Acharya, University of Illinois at Chicago*  
*Davide Fossati, Carnegie Mellon University in Qatar*  
*Barbara Di Eugenio, University of Illinois at Chicago*  
*Omar AlZoubi, Carnegie Mellon University in Qatar*

## Special Session (room: Steamboat)

Sat 10:45 AM - 12:00 PM

- Advanced Placement Computer Science Principles (APCSP): A Report from Teachers  
*Owen Astrachan, Duke University*  
*R. Brook Osborne, Code.org*



**Special Session (room: Mississippi)****Sat 10:45 AM - 12:00 PM**

Special Session: Helping Students to Develop Communication, Teamwork, and Other Process Skills with POGIL

*Clifton Kussmaul, Muhlenberg College*

*Helen Hu, Westminster College*

*Tammy Pirmann, School District of Springfield Township*

**SATURDAY 12:00 PM - 2:00 PM****Luncheon - Keynote by Karen Lee Ashcraft, University of Colorado Boulder****SATURDAY 3:00 PM - 6:00 PM****Workshops**

Workshop #401: JavaScript Applications for CS0/CS1: Getting hands-on with Code.org's App Lab (room: L1)

*Baker Franke, Code.org*

*Sarah Filman, Code.org*

*Brook Osborne, Code.org*

Workshop #402: Programming web services on the cloud with Node.js (room: L2-L3)

*Ariel Ortiz, Tecnológico de Monterrey, Campus Estado de México*

Workshop #403: Teaching Robotics Using ROS (room: L5-L6)

*Nathan Sprague, James Madison University*

*Ralph Grove, James Madison University*

Workshop #405: Advanced Placement Computer Science Principles Performance Task: Create – Applications from Ideas, Approaches to Programming Collaboratively. It's a Hackathon Workshop! (room: L9)

*Lien Diaz, College Board*

*Richard Kick, Newbury Park High School*

*Andrew Kuemmel, Madison West High School*

Workshop #406: Scaling up for CS10K: Teaching and Supporting New Computer Science High School Teachers (room: L10)

*Tiffany Barnes, North Carolina State University*

*Jamie Payton, University of North Carolina at Charlotte*

*Daniel Garcia, University of California and Berkeley*

Workshop #407: App Development for All! (room: L11-L12)

*David Hayes, Lane Tech College Prep High School (Chicago Public Schools)*

*Dale Reed, University of Illinois at Chicago*

Workshop #408: Mixing Code and 3D Printers with Madeup (room: L13-L14)

*Chris Johnson, University of Wisconsin, Eau Claire*

*Heather Amthauer, University of Wisconsin, Eau Claire*

*Ryan Hardt, University of Wisconsin, Eau Claire*

*Peter Bui, University of Notre Dame*

Workshop #409: Infusing Cooperative Learning into Early Computer Science Courses to Support Improved Engagement (room: River Bluff)

*Fran Trees, Rutgers University*

*Jeff Gray, University of Alabama*

*Owen Astrachan, Duke University*

Workshop #410: Solving the Cloud Computing Impasse with MBaaS (room: Sultana)

*Michael Rogers, Northwest Missouri State University*

*Bill Siever, Western Illinois University*

Workshop #411: Reviewing NSF Proposals: Learn about Effective Proposal Writing via the Review Process (room: Mississippi)

*Paul Tymann, The National Science Foundation*

*Michael Erlinger, The National Science Foundation*

Workshop #412: Transition to Java Using Alice 3 (room: Cotton Row)

*Donald Slater, Alice Project, Carnegie Mellon University*

*Wanda Dann, Alice Project, Carnegie Mellon University*