SIGCSE TS 2022

March 2-5, 2022
Rhode Island Convention Center
Providence, RI, USA

ACM 53rd TECHNICAL SYMPOSIUM on COMPUTER SCIENCE EDUCATION

PROVIDENCE, RHODE ISLAND







Conference Program • Exhibit Guide

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(Inside Front Cover)

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Welcome Letter

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Maintaining a Comfortable and Respectful Learning Environment for All

The open exchange of ideas and the freedom of thought and expression are central to the aims and goals of SIGCSE; these require an environment that recognizes the inherent worth of every person and group, that fosters dignity, understanding, and mutual respect, and that embraces diversity. The ACM Code of Ethics (https://www.acm.org/code-of-ethics) embraces the "values of equality, tolerance, respect for others, and the principles of equal justice". For these reasons, SIGCSE is dedicated to providing a harassment-free conference experience.

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Conference participants violating these standards may be sanctioned, expelled from the conference or asked not to attend future conferences or conference events, at the discretion of the conference organizers and the SIG executive committee.

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The organizers of the SIGCSE Technical Symposium reserve the right to reject any materials that we find offensive or inappropriate, such as politically charged material, and will not refund any expenses incurred.

Health and Safety Page

(I will take this information from the SIGCSE website)

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Symposium At-A-Glance

(I will create once the Program has been finalized)

Venue Floor Plan

Keynote Speaker 1

Keynote Speaker 2

Keynote Speaker 3

SIGCSE 2022 Schedule of Events

Wednesday, March 2

Pre-Symposium Supporter Sessions

Google Supporter Session 8:30 am - 12:00 pm **Room: 554 A/B**	**Technical Writing for All Students** Barry Rosenberg, Tina Ornduff, *Google* (See page 00 for abstract)
Abet Supporter Session 8:30 am - 12:00 pm **Room: 553 A/B**	**How Should CS Programs Balance First-Job Readiness and Foundations for Long-Term Career Success?** Rajendra K. Raj, *Rochester Institute of Technology*, Stephanie Smullen, *The University of Tennessee at Chattanooga - retired* (See page 00 for abstract)
Microsoft Supporter Session 1:30 pm - 5:00 pm **Room: 551 A/B**	**Microsoft MakeCode Sampler Pack!** Jacqueline Russell, *Microsoft????* (See page 00 for abstract)

Wednesday Workshops • 7:00 pm - 10:00 pm

Workshop 101 **Room: 552 A/B**	**Teaching Distributed Computing Fundamentals using Raspberry Pi Clusters** Elizabeth Shoop, *Macalester College*; Richard Brown, *St. Olaf College*; Joel Adams, *Calvin University*; Suzanne Matthews, *United States Military Academy*
Workshop 102 **Room: 555 A/B**	**Using Subgoal Labeling in Teaching CS1** Adrienne Decker, *University at Buffalo*; Briana Morrison, *University of Virginia*; Austin Cory Bart, *University of Delaware*
Workshop 103 **Room: 556 A/B**	**Improving the Structure and Content of Early CS Courses with Well Aligned, Engaging Learning Materials** Kalpathi Subramanian, Erik Saule, *University of North Carolina at Charlotte*; Jamie Payton, *Temple University*; Matthew Mcquaigue, *University of North Carolina at Charlotte*
Workshop 104 **Room: Providence Ballroom I/IV (Omni)**	**Tools and Techniques for Increasing and Measuring Student Engagement with Pre-Recorded Videos** Ananda Gunawardeba, *Rutgers University*; Jeremie Lumbroso, *Princeton University*
Workshop 105 **Room: Providence Ballroom I/IV (Omni)**	**Mobile Application Development in Flutter** Larry Heimann, Oscar Veliz, *Carnegie Mellon University*
Workshop 106 **Room: Narragensett Ballroom A (Omni)**	**Heterogeneous Computing for Undergraduates: Introducing the ToUCH Module Repository** Ahmed Ibrahim, *University of Virginia*
Workshop 107 **Room: Narragensett Ballroom B (Omni)**	**Automating Personalized Feedback to Improve Students' Persistence in Computing** Susan Fisk, Cynthia Hunt, *Kent State University*; Lina Battestilli, Bita Akram, Spencer Yoder, Thomas Price, Tiffany Barnes, *North Carolina State University*
Workshop 108 **Room: Narragensett Ballroom C (Omni)**	**Teaching Cybersecurity: Introducing the Security Mindset** Julia Bernd, *International Computer Science Institute*; Dan Garcia, *University of California*; Buffie Holley, *Albemarle High School*; Maritza Johnson, *University of San Diego*

For a full list of workshops and descriptions visit: ***http://sigcse2022.sigcse.org/attendees/workshops.html***

Thursday, March 3

Opening Keynote Session

8:15 am - 9:45 am Room: Ballroom A-E	**Welcome to the 53rd SIGCSE Technical Symposium!** Symposium Chairs: Program Chairs: **KEYNOTE: Title ?????** Speaker, *?????*

Break & Exhibits & NSF Showcase • 10:00 am - 10:45 am

10:00 am - 10:45 am Room: Exhibit Hall C/D	**Break & Exhibits** ***(Exhibit Hall Open 10:00 am - 5:00 pm)***
	NSF Showcase #1 *(See page 00 for complete listing of NSF Showcases)*

Demos • 10:00 am - 10:45 am

10:00 am - 10:45 am Room: Exhibit Hall C/D	**Demo Session #1: Early Programming (Pre-College)** Chairs: Lina Battestilli, *North Carolina State University;* Jennifer Campbell, *University of Toronto* **CodeToon: A New Visual Programming Environment Using Comics for Teaching and Learning Programming** Sangho Suh, *University of Waterloo* **Run, Llama, Run: A Collaborative Physical and Online Coding Game for Children** Stacey A. Koornneef, Jeremy S. Bradbury, *Ontario Tech University*; Michael A. Miljanovic, *University of Toronto* **Shared Virtual Worlds for Accessible Classroom Robotics** Gordon Stein, Ákos Lédeczi, *Vanderbilt University*

Paper Sessions • 10:45 am - 12:00 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Automated Assessment Chair: **Room: 554 A/B**	**Labtool: A Command-Line Interface Lab Assistant and Assessment Tool** Alan Marchiori, *Bucknell University*	**Helping Student Programmers Through Industrial-Strength Static Analysis: A Replication Study** Allyson Senger, Stephen H. Edwards, Margaret Ellis, *Virginia Tech*	**Characterizing Student Development Progress: Validating Student Adherence to Project Milestones** Bradley Erickson, Sarah Heckman, Collin F. Lynch, *North Carolina State University*
Data Science Chair: **Room: Providence Ballroom I/IV (Omni)**	**Integrated Data Science for Secondary Schools: Design and Assessment of a Curriculum** Emmanuel Schanzer, *Bootstrap*; Nancy Pfenning, *University of Pittsburgh*; Flannery Denny, *Bootstrap*; Sam Dooman, *Brown University*; Joe Gibbs Politz, *University of California, San Diego*; Benjamin S. Lerner, *Northeastern University*; Kathi Fisler, Shriram Krishnamurthi, *Brown University*	**How Computer Science and Statistics Instructors Approach Data Science Pedagogy Differently: Three Case Studies** Sam Lau, *UC San Diego*; Deborah Nolan, Joseph Gonzalez, *UC Berkeley*; Philip Guo, *UC San Diego*	**"That's What Science Is, All This Data": Coding Data Visualizations in Middle School Science Classrooms** Ari Krakowski, Eric Greenwald, Natalie Roman, *University of California, Berkeley*

Thursday, March 3

Paper Sessions • 10:45 am - 12:00 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Undergraduate Research Experiences Chair: **Room: Providence Ballroom II/III (Omni)**	**Remote Early Research Experiences for Undergraduate Students in Computing** Cecilia O. Alm, Reynold Bailey, Hannah Miller, *Rochester Institute of Technology*	**Scaling and Adapting a Program for Early Undergraduate Research in Computing** Christine Alvarado, *University of California San Diego*; Joe Hummel, *University of Illinois, Chicago*; Diba Mirza, *University of California, Santa Barbara*; Renata Revelo, *University of Illinois, Chicago*; Lisa Yan, *University of California, Berkeley*	
IDEA: Multilingual Computing Chair: **Room: Providence Ballroom II/III (Omni)**	**English Language Learners in Computer Science Education: A Scoping Review** Yinchen Lei, Meghan Allen, *University of British Columbia*	**Multilingual CS Education Pathways: Implications for Vertically-Scaled Assessment**	**From the Horse's Mouth: The Words We Use to Teach Diverse Student Groups Across Three Continents** Brett A. Becker, Daniel Gallagher, *University College Dublin*; Paul Denny, *University of Auckland*; James Prather, Colleen Gostomski, Kelli Norris, Garrett Powell, *Abilene Christian University*
Pedagogical Libraries and Tools Chair: **Room: Providence Ballroom I/IV (Omni)**	**BEST PAPER** Experience Reports and Tools **Preventing Cheating in Hands-on Lab Assignments** Jan Vykopal, Valdemar Švábenský, Pavel Seda, Pavel Celeda, *Masaryk University*	**Designing Designer: The Evidence-Oriented Design Process of a Pedagogical Interactive Graphics Python Library** Kristina Holsapple, Austin Cory Bart, *University of Delaware*	**Feedback in Context: Using a Code Review Tool for Program Grading** Mary Elaine Califf, Nick Dunne, *Illinois State University*
Online: Sharing Experiences and Infrastructure Chair: **Room: Narragansett Ballroom I/IV (Omni)**	**BEST PAPER** Experience Reports and Tools **Cheating Detection in Online Assessments via Timeline Analysis** Jiameng Du, Yifan Song, Mingxiao An, Marshall An, Christopher Bogart, Majd Sakr, *Carnegie Mellon University*	**Help Supports during Online Delivery: Student Perception and Lessons Learnt from an Online CS2** Andrew Jiang, Bogdan Simion, *University of Toronto Mississauga*	**Evaluating Students' Perception of Online Learning Tools Utilizing 2-D Virtual Spaces** Nadia Najjar, Anna Stubler, Harini Ramaprasad, Heather Lipford, David Wilson, *University of North Carolina at Charlotte*

Thursday, March 3

Panel, Special, and Supporter Sessions • 10:45 am - 12:00 pm

Special Session **Room: 556 A/B** (Streaming Room)	**Tricky Situations: How Would You Respond to Different Biased Statements?** Bryan Twarek, *Computer Science Teachers Association*; Colleen Lewis, *University of Illinois at Urbana-Champaign*; Abigail Joseph, *The Harker School*; Charity Freeman, *Discovery Partners Institute*; Todd Lash, *University of Illinois at Urbana-Champaign*; Mariam Saffar Perez, *University of Illinois at Urbana-Champaign*
Panel Session **Room: 552 A/B** (Streaming Room)	**The Case for Acknowledging Subjectivity in CS Education Research Data** Monica M. McGill, *CSEdResearch.org*; Jean Ryoo, *University of California, Los Angeles*; Allison Scott, *Kapor Center*; Chris Stephenson, *Google*; Jayce R. Warner, *University of Texas Austin*
Panel Session **Room: 555 A/B** (Streaming Room)	**Should the AP Computer Science A Exam Switch to Using Python?** Mehran Sahami, *Stanford University*; Owen Astrachan, *Duke University*; Sandy Czajka, *Riverside Brookfield High School*; Adrienne Decker, *University at Buffalo*; Jennifer Rosato, *College of St. Scholastica*
GitHub Supporter Session **Room: 553 A/B**	**GitHub Global Campus: The New Home for Teachers and Developers** Eric Rosad, Ashley Bass, *GitHub Education*, David J. Malan, *Harvard University* (See page 00 for abstract)
Microsoft Supporter Session **Room: 551 A/B**	**ElectionGuard: Allowing Voters to Confirm That Their Votes Are Correctly Counted** Josh Benaloh, *Microsoft Research* (See page 00 for abstract)

Lunch Break • 12:00 pm - 1:45 pm

12:00 pm - 1:45 pm Room: Ballroom A-E	**First Timer's Lunch**
12:00 pm - 1:45 pm	**Lunch Break** (on your own)

Paper Sessions • 1:45 pm - 3:00 pm

PAPER SESSIONS	1:45 PM	2:10 PM	2:35 PM
Collaboration: Peer Assessment Chair: **Room: 554 A/B**	**Peer Grading Without Protest: The SPARK Approach to Summative Peer Assessment** Jennifer S. Kay, *Rowan University*	**Identifying Struggling Teams in Software Engineering Courses Through Weekly Surveys** Kai Presler-Marshall, Sarah Heckman, Kathryn T. Stolee, *North Carolina State University*	**Peer-grading Explain in Plain English" Questions: A Bayesian Calibration Method for Categorical Answers"** Binglin Chen, Matthew West, Craig Zilles, *University of Illinois at Urbana-Champaign*
Predicting Success Chair: **Room: Providence Ballroom I/IV (Omni)**	**Predicting Student Success in CS2: A Study of CS1 Exam Questions** Leland Beck, Patty Kraft, Alexander W. Chizhik, *San Diego State University*	**Early Identification of Student Struggles at the Topic Level Using Context-Agnostic Features** Kai Arakawa, Qiang Hao, Wesley Deneke, Indie Cowan, *Western Washington University*; Steven Wolfman, *The University of British Columbia*; Abigayle Peterson, *Western Washington University*	**Keep It Relevant! Using In-class Exercises to Predict Weekly Performance in CS1** Eric Hicks, Amy Cook, Kriangsiri Malasri, Alina Zaman, Vinhthuy Phan, *The University of Memphis*

Thursday, March 3

Paper Sessions • 1:45 pm - 3:00 pm

PAPER SESSIONS	1:45 PM	2:10 PM	2:35 PM
Writing/Professional Communication Chair: **Room: Providence Ballroom II/III (Omni)**	**Exploring Common Writing Issues in Upper-Year Computer Science** Rehmat Munir, Francesco Strafforello, Niveditha Kani, Michael Kaler, Bogdan Simion, Lisa Zhang, *University of Toronto Mississauga*	**Five Pedagogical Principles of a User-Centered Design Course that Prepares Computing Undergraduates for Industry Jobs** Sean Kross, Philip Guo, *University of California San Diego*	**Opening Sentences in Academic Writing: How Security Researchers Defeat the Blinking Cursor** Didem Demirag, Jeremy Clark, Concordia University
IDEA: Accessibility Chair: **Room: Narragansett Ballroom A (Omni)**	**Let's Play: Increasing Accessibility Awareness and Empathy Through Games** Devorah Kletenik, *Brooklyn College, City University of New York*; Rachel F. Adler, *Northeastern Illinois University*	**The Sounds of Sorting Algorithms: Sonification as a Pedagogical Tool** Joel C. Adams, Bryce D. Allen, Bryan C. Fowler, Mark C. Wissink, Joshua J. Wright, *Calvin University*	**Achieving CSforAll: Preparing Special Education Pre-service Teachers to bring Computing to Students with Disabilities** Aman Yadav, *Michigan State University*; Maya Israel, *University of Florida*; Emily Bouck, *Michigan State University*; Alexis Cobo, *University of Florida*; John Samuels, *Gainesville*
AI/ML Chair: **Room: Narragansett Ballroom B (Omni)**	**AI Book Club: An Innovative Professional Development Model for AI Education** Irene Lee, *Massachusetts Institute of Technology*; Helen Zhang, *Boston College*; Kate Moore, *Massachusetts Institute of Technology*; Xiaofei Zhou, *University of Rochester*; Beatriz Perret, *Massachusetts Institute of Technology*; Yihong Cheng, *Boston College*; Ruiying Zheng, Grace Pu, *Massachusetts Institute of Technology*	**BEST PAPER** Computing Education Research **"A key to reducing inequities in like, AI, is by reducing inequities everywhere first": Emerging Critical Consciousness in a Co-Constructed Secondary CS Classroom** Jayne Everson, *University of Washington*; F. Megumi Kivuva, *Bard College*; Amy J. Ko, *University of Washington*	**Identifying Common Errors in Open-Ended Machine Learning Projects** James Skripchuk, Yang Shi, Thomas Price, *North Carolina State University*
Motivation and Student Voice Chair: **Room: Narragansett Ballroom C (Omni)**	**Using Assignment Design as an Instrument to Collect Student Voice** Rita Garcia, Bradley Alexander, *University of Adelaide*	**Post-Exam Videos for Assessment in Computing Courses: See and Hear Students' Thinking** Tammy VanDeGrift, *University of Portland*	**Student Motivations and Goals for CS1: Themes and Variations** David Liben-Nowell, Anna N. Rafferty, *Carleton College*

Panel, Special, and Supporter Sessions • 1:45 pm - 3:00 pm

Special Session **Room: 556 A/B** (Streaming Room)	**A First Look at the ACM/IEEE-CS/AAAI Computer Science Curricula (CS202X)** Amruth N. Kumar, *Ramapo College of New Jersey*; Rajendra K. Raj, *Rochester Institute of Technology*
Panel Session **Room: 552 A/B** (Streaming Room)	**Belonging in Computing: The Contribution of Gender-based Community Building** Lyn E. Swackhamer, *University of Colorado*; Terina-Jasmine Alladin, *NCWIT*; Hana Memon, *Barnard College*; Amy J. Ko, *University of Washington*; Shira Wein, *Georgetown University*
Panel Session **Room: 555 A/B** (Streaming Room)	**It Seemed Like a Good Idea at the Time (COVID-19 Edition)** Dan Garcia, *UC Berkeley*; Jim Huggins, *Kettering University*; Christine Alvarado, *UC San Diego*; Paul Gestwicki, *Ball State University*; Andy Gunawardena, *Princeton University*; Victoria Hong, *St. Joseph's College*; Ellen Spertus, *Mills College*

Thursday, March 3

Panel, Special, and Supporter Sessions • 1:45 pm - 3:00 pm

Google Supporter Session **Room: 551 A/B**	**Getting More From Google: Engaging with Google's CS Education Programs** Kim Roberts, Kyle Ali, Nicki Anselmo, Sidnie Davis, Shanika Hope, Tina Ornduff, *Google* (See page 00 for abstract)
Wiley and zyBooks, A Wiley Brand Supporter Session **Room: 553 A/B**	**How a Deep-dive Analysis of Your Class zyBook Can Improve Your Course and Reduce Cheating** Chelsea Gordon, Roman Lysecky, *zyBooks, A Wiley Brand*, Frank Vahid, *zyBooks, A Wiley Brand/ University of California, Riverside* (See page 00 for abstract)

Break, Exhibits & NSF Showcase • 3:00 pm - 3:45 pm

3:00 pm - 3:45 pm Room: Exhibit Hall C/D	**Break & Exhibits**
	NSF Showcase #2 (See page 00 for complete listing of NSF Showcases)

Demos • 3:00 pm - 3:45 pm

3:00 pm - 3:45 pm Room: Exhibit Hall C/D	**Demo Session #2: Data Structures and Algorithms** Chairs: Lina Battestilli, *North Carolina State University;* Jennifer Campbell, *University of Toronto* **High School BRIDGES: Visualizations of Data, Data Structures, and More** Kathryn Perry, *Burnt Hills - Ballston Lake High School*; Cedric Sirianni, *Brown University*; Owen Bechtel, *Burnt Hills - Ballston Lake High School*; Kalpathi Subramanian, Erik Saule, *University of North Carolina at Charlotte* **StoryQ: A Web-Based Machine Learning and Text Mining Tool for K-12 Students** Jie Chao, Bill Finzer, *Concord Consortium*; Carolyn P. Rosé, *Carnegie Mellon University*; Shiyan Jiang, *North Carolina State University*; Michael Yoder, James Fiacco, Chas Murray, *Carnegie Mellon University*; Cansu Tatar, *North Carolina State University*; Kenia Wiedemann, *Concord Consortium* **Let's Learn Algorithms with AlgoTutorBot! An Entire Course as an Educational Escape Room** Austin Cory Bart, *University of Delaware*

Paper Sessions • 3:45 pm - 5:00 pm

PAPER SESSIONS	3:45 PM	4:10 PM	4:35 PM
Perspectives and (Mis)conceptions Chair: **Room: Providence Ballroom I/IV (Omni)**	**How Well do Students Understand the All-Encompassing, Ubiquitous, and Interconnected Nature of IoT? Evaluating Student Capstone Projects** Timo Hynninen, *South-Eastern Finland University of Applied Sciences*; Antti Knutas, *LUT University*	**On Students' Ability to Resolve their own Tracing Errors through Code Execution** Mohammed Hassan, Craig Zilles, *University of Illinois at Urbana-Champaign*	**"It is the Future": Exploring Parent Perspectives of CS Education** Jaemarie Solyst, Laura Yao, Alexis Axon, Amy Ogan, *Carnegie Mellon University*
Ethics Proposals and Counternarratives Chair: **Room: Providence Ballroom II/III (Omni)**	**CS Education for the Socially-Just Worlds We Need: The Case for Justice-Centered Approaches to CS in Higher Education** Kevin Lin, *University of Washington*	**Teaching Ethics by Teaching Ethics Pedagogy: A Proposal for Structural Ethics Intervention** Victoria Dean, Illah Nourbakhsh, *Carnegie Mellon University*	**The House of Computing: Integrating Counternarratives into Computer Systems Education** Mara Kirdani-Ryan, Amy J. Ko, *University of Washington*

Thursday, March 3

Paper Sessions • 3:45 pm - 5:00 pm

PAPER SESSIONS	3:45 PM	4:10 PM	4:35 PM
Correlation Studies ▶ Chair: **Room: Narragansett Ballroom A (Omni)**	**Factors Influencing Student Performance and Persistence in CS2** Sara Hooshangi, Margaret Ellis, Stephen H. Edwards, *Virginia Tech*	**Relationships Between an Early-Stage Spatial Skills Test and Final CS Degree Outcomes** Jack Parkinson, Quintin Cutts, *University of Glasgow*	**Who Uses Office Hours? A Comparison of In-Person and Virtual Office Hours Utilization** Zhikai Gao, Sarah Heckman, Collin Lynch, *North Carolina State University*
Code Quality ▶ Chair: **Room: Narragansett Ballroom B (Omni)**	**Hyperstyle: A Tool for Assessing the Code Quality of Solutions to Programming Assignments**	**Are Undergraduate Creative Coders Clean Coders? A Correlation Study** Wouter Groeneveld, *KU Leuven*; Dries Martin, Tibo Poncelet, *Hasselt University*; Kris Aerts, *KU Leuven*	**Readable vs. Writable Code: A Survey of Intermediate Students' Structure Choices** Eliane Wiese, *Univeristy of Utah*; Anna Rafferty, *Carleton College*; Jordan Pyper, *University of Utah*
Sister: EngageCSEdu ▶ Chair: **Room: Narragansett Ballroom C (Omni)**			

Panel, Special, and Supporter Sessions • 3:45 pm - 5:00 pm

Special Session 03 **Room: 556 A/B** (Streaming Room)	**K-12 Computing Education and Education Research Resources** Monica M. McGill, *CSEdResearch.org & Knox College*; Jake Baskin, *Computer Science Teachers Association*; Miles Berry, *University of Roehampton*; Quinn Burke, *Digital Promise*; Leigh Ann Delyser, *CSforALL*; Shuchi Grover, *Looking Glass Venture & Stanford University*; Colleen Lewis, University of Illinois at Urbana-Champaign; Briana B. Morrison, *University of Virginia*; Davina Pruitt-Mentle, *National Initiative for Cybersecurity Education (NICE) & National Institute of Standards and Technology (NIST)*
Panel Session 10 **Room: 552 A/B** (Streaming Room)	**A New Class of Teaching-Track Faculty: No Ph.D. Required** Kendra Walther, *University of Southern California*; Adam Blank, *California Institute of Technology*; Michael Ball, *University of California, Berkeley*; Suraj Rampure, *University of California, San Diego*
Panel Session 01 **Room: 555 A/B**	**Advancing Opportunities for CS Teachers: How To Best Support Professional Development for Experienced Teachers in K-12 CS Education** Yasmin Kafai, *University of Pennsylvania*; Joanna Goode, *University of Oregon*; Linnea Logan, *White Fish Bay Schools*; Bryan Twarek, *CSTA*; Deborah Fields, *Utah State University*; Aman Yadav, *Michigan State University*
NSF Supporter Session **Room: 551 A/B**	**Title: TBD** TBD (See page 00 for abstract)
Gradescopeby Turnitin Supporter Session **Room: 553 A/B**	**Title: TBD** TBD (See page 00 for abstract)

Thursday, March 3

Lightning Talks • 3:45 pm - 5:00 pm

3:45 pm - 5:00 pm Room: 554 A/B	**Lightning Talks #1** *(See page 00 for complete listing of Lightning Talks)*

Supporter Sessions • 5:30 pm - 6:20 pm

ABET Supporter Session **Room: 551 A/B**	**An Update on ABET Accreditation Criteria** Rajendra K. Raj, *Rochester Institute of Technology*; Stephanie Smullen, *The University of Tennessee at Chattanooga - retired* *(See page 00 for abstract)*
Replit Supporter Session **Room: 553 A/B**	**Collaborative Coding with Replit: Zero-Setup Online Coding for Any Device** Lena Vu Sawyer, *Replit* *(See page 00 for abstract)*

Supporter Session • 6:30 pm - 7:20 pm

Pearson Supporter Session **Room: 551 A/B**	**Pearson's Revel for Online and Hybrid Programming Courses: Implementation and Increasing Student Success** *(See page 00 for abstract)* TBD, *TBD*

Birds of a Feather • 6:30 pm - 7:20 pm

See page 00 for Birds of A Feather Flock A Virtual

6:30 pm - 7:20 pm Room #s: See page 00	**Birds of a Feather Flock A** *(See page 00 for complete list of Birds of a Feather)* Chairs: Mary Anne Egan, *Siena College;* Dale-Marie Wilson, *University of North Carolina at Charlotte*

Birds of a Feather • 6:30 pm - 7:20 pm

See page 00 for Birds of A Feather Flock B Virtual

6:30 pm - 7:20 pm Room #s: See page 00	**Birds of a Feather Flock B** *(See page 00 for complete list of Birds of a Feather)* Chairs: Mary Anne Egan, *Siena College;* Dale-Marie Wilson, *University of North Carolina at Charlotte*

Thursday Reception

7:30 pm - 9:30 pm Rotunda & East Pre-function	**SIGCSE Reception**

Friday, March 13

Outstanding Contribution Plenary

8:15 am - 9:45 am Room: Ballroom A-E	**General Information** Symposium Chairs: Jian Zhang, *Texas Woman's University;* Mark Sherriff, *University of Virginia* Program Chairs: Sarah Heckman, *North Carolina State University;* Alvaro Monge, *California State University, Long Beach;* Pamela Cutter, *Kalamazoo College* **KEYNOTE: Perspectives on Research and Practice in Computing Education** **2020 SIGCSE Award for Outstanding Contribution to Computer Science Education** Professor Lauri Malmi, *Aalto University/Helsinki University of Technology*

Break & Exhibits & NSF Showcase • 10:00 am - 10:45 am

10:00 am - 10:45 am Room: Exhibit Hall C/D	**Break & Exhibits** ***(Exhibit Hall Open 10:00 am - 5:00 pm)***
	NSF Showcase #3 *(See page 00 for complete listing of NSF Showcases)*

Demos • 10:00 am - 10:45 am

10:00 am - 10:45 am Room: Exhibit Hall C/D	**Demo Session #3: Block-Based Programming and Testing** Chairs: Lina Battestilli, *North Carolina State University;* Jennifer Campbell, *University of Toronto* **Strype: Frame-Based Editing Tool for Programming the Micro:bitthrough Python** Charalampos Kyfonidis, Pierre Weill-Tessier, Neil Brown, *King's College London* **Snap! 7 - Microworlds, Scenes, and Extensions!** Dan Garcia, Michael Ball, *UC Berkeley*; Yuan Garcia, *Mills High School* **Testing Tutor: A Testing Pedagogical Active Learning Platform** Lucas Cordova, *Western Oregon University*; Jeffrey Carver, *University of Alabama*; Gursimran Walia, *Georgia Southern University*

Poster Session • 10:00 am - 12:00 pm

10:00 am - 12:00 pm Room: Exhibit Hall C/D	**Poster Session #1** *(See pages 00-00 for complete listing of Posters)* Chairs:

Paper Sessions • 10:45 am - 12:00 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Collaboration: Pedagogical Strategies Chair: **Room: 554 A/B**	**Experience Report on the Use of Breakout Rooms in a Large Online Course** Sadia Sharmin, *University of Toronto*; Larry Yueli Zhang, *York University*	**Pair Programming in a Pandemic: Understanding Middle School Students' Remote Collaboration Experiences** Aisha Chung Galdo, Mehmet Celepkolu, Nicholas Lytle, Kristy Elizabeth Boyer, *University of Florida*	**It's Challenging but Doable: Lessons Learned from a Remote Collaborative Coding Camp for Elementary Students** Yingbo Ma, Julianna Martinez Ruiz, Timothy D. Brown, Kiana-Alize Diaz, *University of Florida*; Adam M. Gaweda, *North Carolina State University*; Mehmet Celepkolu, Kristy Elizabeth Boyer, *University of Florida*; Collin F. Lynch, Eric Wiebe, *North Carolina State University*

Friday, March 13

Paper Sessions • 10:45 am - 12:00 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Promoting Successful Academic Behaviors Chair: **Room: Providence Ballroom I/IV (Omni)**	**Increase Performance in CS 2 via a Spiral Redesign of CS 1** Albert Lionelle, Sudipto Ghosh, *Colorado State University*; Benjamin Say, *Metropolitan Community College*; J. Ross Beveridge, *Colorado State University*	**Exploring the Impact of Voluntary Practice and Procrastination in an Introductory Programming Course** Jiayi Zhang, Taylor Cunningham, Rashmi Iyer, Ryan Baker, Eric Fouh, *University of Pennsylvania*	**If in Doubt, Try Three: Developing Better Version Control Commit Behaviour with First Year Students** Amanda Berg, Simon Osnes, Richard Glassey, *KTH Royal Institute of Technology*
Title?????????? Chair: **Room: Providence Ballroom II/III (Omni)**			
IDEA: Belonging Chair: **Room: Narraggansett Ballroom A (Omni)**	**What is a Computer Scientist?: Unpacking the Ontological Beliefs of Black and Hispanic Female Computing Students** Jake Lopez, Monique Ross, Atalie Garcia, Carolina Uribe-Gosselin, *Florida International University*	**An Analysis of Stress and Sense of Belonging Among Native and Non-native English Speakers Learning Computer Science** Vardhan Agarwal, Yada Chuengsatiansup, Elise Kim, Yuzi LYu, Adalbert Gerald Soosai Raj, *University of California, San Diego*	**Who Belongs in Computer Science?** Zachary Opps, Aman Yadav, *Michigan State University*
K-12: Policay Trends and Considerations Chair: **Room: Narraggansett Ballroom B (Omni)**	**Trends in CS Teacher Professional Development: A Report from the CSTA PD Committee** Michelle Friend, University of Nebraska at Omaha; Bryan Twarek, *Computer Science Teachers Association*; James Koontz, *Fairfax County Public Schools*; Amanda Bell, *Computer Science Teachers Association*; Abigail Joseph, *The Harker School*	**iSchools as Venues for Expanding the K-12 Computer Science Teacher Pipeline** David Weintrop, *University of Maryland*	**Standards-Aligned Instructional Supports to Promote Computer Science Teachers' Pedagogical Content Knowledge** Satabdi Basu, Daisy Rutstein, Carol Tate, Arif Rachmatullah, Hui Yang, *SRI International*
Online: Comparing Tools Chair: **Room: Narraggansett Ballroom C (Omni)**	**Comparing Student Experiences in Synchronous CS1 Classes in Gather.Town vs. Zoom** Celine Latulipe, Amy De Jaeger, *University of Manitoba*	**Detecting Struggling Students from Interactive Ebook Data: A Case Study Using CSAwesome** Barbara J. Ericson, Hisamitsu Maeda, Paramveer S. Dhillon, *University of Michigan*	**Jupyter in the Classroom: An Experience Report** Abdulmalek Al-Gahmi, Yong Zhang, Hugo Valle, *Weber State University*

Friday, March 13

Panel, Special, and Supporter Sessions • 10:45 am - 12:00 pm

Special Session **Room: 556 A/B** **(Streaming Room)**	**A Hands-On Tutorial on How To Incorporate Computing for Social Good in the Introductory Course Sequence** Mikey Goldweber, *Xavier University*; Lisa Kaczmarczyk, *Lisa Kaczmarczyk PhD Consulting, LLC*; Rick Blumenthal, *Regis University*; Alison Clear, *Eastern Institute of Technology*; Johanna Blumenthal, *Regis University*
Panel Session **Room: 552 A/B** **(Streaming Room)**	**Setting the Table for Equity: A Leadership Model for Broadening Participation in Computing** Joshua Childs, *University of Texas Austin*; Amy J. Ko, *University of Washington Seattle*; Crystal M. Franklin, *Cleveland State University*; Lien Diaz, *Constellations Center for Equity in Computing*; Sarah T. Dunton, *ECEP Alliance/MGHPCC*
Panel Session **Room: 555 A/B** **(Streaming Room)**	**Innovative Approaches to Managing Scale** Dan Garcia, *UC Berkeley*; Kris Jordan, *University of North Carolina, Chapel Hill*; Colleen M. Lewis, *University of Illinois at Urbana-Champaign*; Ketan Mayer-Patel, *University of North Carolina, Chapel Hill*
Google Supporter Session **Room: 551 A/B**	**Supporting Diverse, Equitable, and Inclusive Student Research in Computing** Moderator: Sloan Davis Panelists: TBA all are university faculty who are exploreCSR award recipients
Microsoft Supporter Session **Room: 553 A/B**	**AP Computer Science Principles with Microsoft MakeCode & TEALS** Jacqueline Russell, TBD, *TEALS representative*

Lunch Break • 12:00 pm - 1:45 pm

12:00 pm - 1:45 pm	**Lunch Break** (on your own)

Paper Sessions • 1:45 pm - 3:00 pm

PAPER SESSIONS	1:45 PM	2:10 PM	2:35 PM
Collaboration: Group Health Chair: **Room: 554 A/B**	**Gender Influence on Communication Initiated within Student Teams** Rita Garcia, Chieh-Ju Liao, Ariane Pearce, *University of Adelaide*; Christoph Treude, *The University of Melbourne*	**POGIL in CS1: Evidence for Student Learning and Belonging** Chris Mayfield, *James Madison University*; Sukanya Kannan Moudgalya, Aman Yadav, *Michigan State University*; Clif Kussmaul, *Green Mango Associates, LLC*; Helen H. Hu, *Westminster College*	**Designing a Dashboard for Student Teamwork Analysis** Niki Gitinabard, Allobee Inc; Sarah Heckman, Tiffany Barnes, Collin Lynch, *North Carolina State University*
Reducing Curricular Barriers Chair: **Room: Providence Ballroom I/IV (Omni)**	**Engineering a Complete Curriculum Overhaul** Luther Tychonievich, Mark Sherriff, University of Virginia	**Removing a Barrier: Analysis of the Impact of Removing Calculus and Physics from CS on Employability, Salary, and Broadening Participation** Monique Ross, Mark A. Weiss, Lilia Minaya, Andrew Laginess, Disha Patel, Kathleen Quardokus Fisher, *Florida International University*	**Design and Evaluation of "The Missing CS Class," a Student-led Undergraduate Course to Reduce the Academia-industry Gap** Grant Gilson, Stephen Ott, Noah Rose Ledesma, Aakash Prabhu, Joël Porquet-Lupine, *University of California, Davis*

Friday, March 13

Paper Sessions • 1:45 pm - 3:00 pm

PAPER SESSIONS	1:45 PM	2:10 PM	2:35 PM
Ethics: Integrating Contents Chair: **Room: Providence Ballroom II/III (Omni)**	**Principles Matter: Integrating an Ethics Intervention into a Computer Security Course** Justin Petelka, Megan Finn, Franziska Roesner, *University of Washington*; Katie Shilton, *University of Maryland*	**Embedding Ethics in Computer Science Courses: Does it Work?** Diane Horton, Sheila McIlraith, Nina Wang, Maryam Majedi, Emma McClure, Benjamin Wald, *University of Toronto*	**How Do Undergraduate Students Reason About Ethical and Algorithmic Decision-Making?** Ashish Aggarwal, Saurabh Ranjan, *University of Florida*
CS1 Teaching Techniques Chair: **Room: Narragansett Ballroom A (Omni)**	**Investigating the Impact of Using a Live Programming Environment in a CS1 Course** Ruanqianqian (Lisa) Huang, Kasra Ferdowsi, *UC San Diego*; Ana Selvaraj, *Stanford University & UC San Diego*; Adalbert Gerald Soosai Raj, Sorin Lerner, *UC San Diego*	**Increase Performance and Retention: Teach Students How To Study** Albert Lionelle, Sudipto Ghosh, Shannon Ourada, Westin Musser, *Colorado State University*	**Try That Again! How a Second Attempt on In-Class Coding Problems Benefits Students in CS1** Amy Cook, Alina Zaman, Eric Hicks, Kriangsiri Malasri, Vinhthuy Phan, *University of Memphis*
K-12: Developing the Evidence Base Chair: **Room: Narragansett Ballroom B (Omni)**	**Developing Evidence-Based Teacher Practice Briefs with Middle School Computer Science Teachers** Monica M. McGill, Anni Reinking, *CSEdResearch.org*	**Elementary Students' Understanding of Variables in Computational Thinking-Integrated Instruction: A Mixed Methods Study** Feiya Luo, *The University of Alabama*; Wei Yan, Ruohan Liu, Maya Israel, *University of Florida*	**Reimagining Professional Development for K-8 CS Teachers: Evaluating a Virtual, Diffuse Model** Jennifer Tsan, *University of Chicago*; Merijke Coenraad, *University of Maryland*; Zachary Crenshaw, Jen Palmer, Donna Eatinger, *University of Chicago*; Kristan Beck, *Chicago Public Schools*; David Weintrop, *University of Maryland*; Diana Franklin, *University of Chicago*
Interdisciplinary Computing Chair: **Room: Narragansett Ballroom C (Omni)**	**CS Curricular Innovations with a Liberal Arts Philosophy** James D. Teresco, *Siena College*; Andrea Tartaro, *Furman University*; Amanda Holland-Minkley, *Washington & Jefferson College*; Grant Braught, *Dickinson College*; Jakob Barnard, *University of Jamestown*; Douglas Baldwin, *SUNY Geneseo*	**Broadening Participation in Computing via Ubiquitous Combined Majors (CS+X)** Carla E. Brodley, Benjamin J. Hescott, Jessica Biron, Ali Ressing, Melissa Peiken, Sarah Maravetz, Alan Mislove, *Northeastern University*	**BEST PAPER** Position and Curricula Initiatives **Bringing High-level" Down to Earth: Gaining Clarity in Conversational Programmer Learning Goals"** Kathryn Cunningham, Yike Qiao, Alex Feng, Eleanor O'Rourke, *Northwestern University*

Friday, March 13

Panel, Special, and Supporter Sessions • 1:45 pm - 3:00 pm

Panel Session 12 **Room: 552 A/B**	**The Needs of K-12 Computer Science Educators Towards Building an Inclusive Classroom: Implications for Policy, Practice, and Research** Kalisha Davis, *Kapor Center*; Bryan Twarek, *Computer Science Teachers Association*; Dinah Becton-Consuegra, Sonia Koshy, *Kapor Center*
Panel Session 04 **Room: 555 A/B**	**Technology We Can't Live Without! (COVID-19 edition)** Dan Garcia, *UC Berkeley*; Zelda Allison, *Roosevelt Middle School*; Abigail Joseph, *The Harker School*; David J. Malan, *Harvard University*; Kristin Stephens-Martinez, *Duke University*
Special Session 05 **Streaming Room: 556 A/B**	**Transitioning from Blocks to Text** Neil C. C. Brown, Michael Kölling, Charalampos Kyfonidis, Pierre Weill-Tessier, *King's College London*
GitHub Supporter Session **Room: 551 A/B**	**Scale Your Classroom with GitHub Classroom and Codespaces** Katherine Kampf, *GitHub Education*, Filisha Shah, *Microsoft*
Codio Supporter Session **Room: 553 A/B**	**Easily Adopt Research-based Teaching Practices at Scale** Elise Deitrick, *Codio*

Break & Exhibits & NSF Showcase • 3:00 pm - 3:45 pm

3:00 pm - 3:45 pm Room: Exhibit Hall C/D	**Break & Exhibits** ***(Exhibit Hall Open 10:00 am - 5:00 pm)***
	NSF Showcase #4 *(See page 00 for complete listing of NSF Showcases)*

Demos • 3:00 pm - 3:45 pm

3:00 pm - 3:45 pm Room: Exhibit Hall C/D	**Demo Session #4: Advanced Courses (Security/Databases)** Chairs: Lina Battestilli, *North Carolina State University;* Jennifer Campbell, *University of Toronto* **SEED Internet Emulator: An Open-Source Tool for Network and Cybersecurity Courses** Wenliang Du, *Syracuse University* **Laundry Overflow: Engaging Diverse Students in CyberSecurity Using Interactive Analogies** Zhen Wu, Rachel Puckett, Wonsun Ahn, Sherif Khattab, Luis Oliveira, Vinicius Petrucci, *University of Pittsburgh* **I-Rex: An Interactive Relational Query Debugger for SQL** Yihao Hu, Zhengjie Miao, Zhiming Leong, Haechan Lim, Zachary Zheng, Sudeepa Roy, Kristin Stephens-Martinez, *Jun Yang, Duke University*

Poster Session • 3:00 pm - 5:00 pm

See page 00 for Poster Session #2 Virtual

3:00 pm - 5:00 pm Room: Exhibit Hall C/D	**Poster Session #2** *(See pages 00-00 for complete listing of Posters)* Chairs:

Friday, March 13

Paper Sessions • 3:45 pm - 5:00 pm

PAPER SESSIONS	3:45 PM	4:10 PM	4:35 PM
Learning Analytics Chair: **Room: 554 A/B**	**A Practical Model of Student Engagement While Programming** John Edwards, Kaden Hart, Christopher Warren, *Utah State University*	**Tracking Large Class Projects in Real-Time Using Fine-Grained Source Control** Gustavo Rodriguez-Rivera, Jeff Turkstra, Jordan Buckmaster, Killian LeClainche, Shawn Montgomery, William Reed, Ryan Sullivan, Jarett Lee, *Purdue University*	**Large-Scale Analysis of Error Frequencies in Logo Programming** Jacqueline Staub, Zaheer Chothia, *ETH Zurich*
IDEA: Culture and Structures Chair: **Room: Narragansett Ballroom A (Omni)**	**Departmental Culture and Pedagogical Choices: Student-Centered Teaching in Introductory Computing Classes** Christopher Lynnly Hovey, *University of Colorado Boulder*; Kathleen J. Lehman, *UCLA*; Tiffani Riggers-Piehl, *University of Missouri-Kansas City*	**A Project-Based Curriculum for Computer Science Situated to Serve Underrepresented Populations** Rebecca Bates, Jonathan Hardwick, Guarionex Salivia, Lin Chase, *Minnesota State University, Mankato*	
K-12: Fostering Partnerships Chair: **Room: Narragansett Ballroom B (Omni)**	**How a Research-Practice Partnership Refined its Strategy for Integrating CS/CT into K-5 Curricula: An Experience Report** W. Richards Adrion, *University of Massachusetts Amherst*; Katie Bevan, Paul Foster, Denise Matuszczak, Rachel Miller, Laura Rita, *Springfield Public Schools*; Florence R. Sullivan, Sneha Veeragoudar, *University of Massachusetts Amherst*; Scott Wohlers, Melissa Zeitz, *Springfield Public Schools*	**Creating a High Quality, High Impact CS Teacher Prep Program** J. Ben Schafer, J. Philip East, *University of Northern Iowa*	**Building CS Teacher Capacity Through Comprehensive College/High School Partnerships** Robin Flatland, James Matthews, Pauline White, Mary Anne Egan, Jesse Moya, *Siena College*
Tools Chair: **Room: Narragansett Ballroom C (Omni)**	**YODA: A Pedagogical Tool for Teaching Systems Concepts** Apan Qasem, *Texas State University*	**BEST PAPER** Experience Reports and Tools **Exploring Design Choices to Support Novices' Example Use During Creative Open-Ended Programming** Wengran Wang, Audrey Le Meur, Mahesh Bobbadi, Bita Akram, Tiffany Barnes, Chris Martens, Thomas Price, *North Carolina State University*	**Automatic Generation and Marking of UML Database Design Diagrams** Sarah Foss, Tatiana Urazova, Ramon Lawrence, *University of British Columbia*

Friday, March 13

Panel, Special, and Supporter Sessions • 3:45 pm - 5:00 pm

Special Session **Room: 556 A/B** (Streaming Room)	**Piecing Together the Next 15 Years of Computing Education Research Workshop Report** Adrienne Decker, *University at Buffalo*; Mark Allen Weiss, *Florida International University*; Brett A. Becker, *University College Dublin*; John P. Dougherty, *Haverford College*; Stephen H. Edwards, *Virginia Tech*; Joanna Goode, *University of Oregon*; Amy J. Ko, *University of Washington*; Monica M. McGill, *CSEdResearch.org*; Briana B. Morrison, *University of Virginia*; Manuel Perez-Quinones, *University of North Carolina at Charlotte*; Yolanda A. Rankin, *Florida State University*; Monique Ross, *Florida International University*; Jan Vahrenhold, *Westfälische Wilhelms-Universität*; David Weintrop, *University of Maryland*; Aman Yadav, *Michigan State University*
Panel Session **Room: 552 A/B** (Streaming Room)	**Moving Toward a Responsible CS Curriculum: Every Course Has a Role to Play** Patrick D. Anderson, *Central State University*; Emanuelle Burton, *University of Illinois at Chicago*; Jaye Nias, *Spelman College*; Marty J. Wolf, *Bemidji State University*
Panel Session **Room: 555 A/B** (Streaming Room)	**Approaches for Weaving Responsible Computing into Data Structures and Algorithms Courses** Kathi Fisler, *Brown University*; Sorelle Friedler, *Haverford College*; Kevin Lin, *University of Washington*; Suresh Venkatasubramanian, *Brown University*
Rephactor Supporter Session **Room: 551 A/B**	**The Online Textbook That You and Your Students Will Love** Tom Way, John Lewis, *Rephactor*
Microsoft Supporter Session **Room: TBD**	**Core Developer Tools for Your Computer Science Classroom** Sana Ajani, Filisha Shah

Student Research Competition • 3:45 pm - 5:00 pm

See page 00 for Virtual Student Research Competition

3:00 pm - 3:45 pm Room: Providence Ballroom I/IV (Omni)	**Student Research Competition- Undergraduate** *(See page 00 for complete SRC listing)*
3:00 pm - 3:45 pm Room: Providence Ballroom II/III (Omni)	**Student Research Competition- Graduate** *(See page 00 for complete SRC listing)*

5:10 pm - 6:00 pm Room: TBD	**SIGCSE Business Meeting**
6:00 pm - 7:00 pm Room: TBD	**CCSC Business Meeting**
6:00 pm - 7:00 pm Room: TBD	**NCWIT Reception**
7:00 pm - 8:00 pm Room: TBD	**Community College Reception**

Friday, March 13

Friday Workshops • 7:00 pm - 10:00 pm

Workshop 301 **Room: 551 A/B**	**Getting Started with Source Code Analysis for Programming Education Research** Neil C. C. Brown, Michael Kölling, Charalampos Kyfonidis, Pierre Weill-Tessier, *King's College London*
Workshop 302 **Room: 553 A/B**	**Transform Your Computer Science Course with Specifications Grading** David L. Largent, *Ball State University*; Christian Roberson, *Florida Southern College*; Carlo Sgro, *Conestoga College*; Manuel Manuel Pérez Quiñones, *University of North Carolina at Charlotte*; Linda F. Wilson, *Texas Lutheran University*
Workshop 303 **Room: 554 A/B**	**Guiding Students to Discover CS Concepts and Develop Process Skills Using POGIL** Olga Glebova, *Georgia State University*; Kendra Walther, *University of Southern California*; Clif Kussmaul, *Green Mango Associates, LLC*
Workshop 304 **Room: 552 A/B**	**A Tutorial for Adopting the µMPS3/Pandos Project in the Operating Systems Course** Mikey Goldweber, *Xavier University*; Renzo Davoli, *Università di Bologna*
Workshop 305 **Room: 555 A/B**	**Designing TA Training Programs for Broadening Participation** Dee A. B. Weikle, Michael C. Stewart, Sharon Simmons, *James Madison University*
Workshop 306 **Room: 556 A/B**	**Innovation in Undergraduate Data Science Education** Eric Van Dusen, John DeNero, Kseniya Usovich, *University of California, Berkeley*
Workshop 307 **Room: Providence Ballroom I/IV (Omni)**	**STARS Ignite: A Program for Supporting Professors in Organizing Student Cohorts for Conferences** Amy Isvik, Veronica Cateté, Lina Battestilli, Tiffany Barnes, *North Carolina State University*; Jamie Payton, Chelsea Zackey, *Temple University*
Workshop 308 **Room: Providence Ballroom II/III (Omni)**	**Making Art with and about Artificial Intelligence: Three Approaches to Teaching AI and AI Ethics to Middle and High School Students** Benjamin Walsh, *University of Colorado Boulder*; Safinah Ali, *Massachusetts Institute of Technology*; Francisco Castro, *University of Massachusetts Amherst*; Kayla Desportes, *New York University*; Daniella DiPaola, Irene Lee, *Massachusetts Institute of Technology*; William Payne, *New York University*; Scott Sieke, *CU Science Discovery*; Helen Zhang, *Boston College*

For a full list of workshops and descriptions visit: ***http://sigcse2022.sigcse.org/attendees/workshops.html***

Saturday, March 5

Closing Keynote Session

8:15 am - 9:30 am Room: Ballroom A-E	**KEYNOTE: Title ?????** Speaker, *?????*

Paper Sessions • 9:45 am - 10:35 am

PAPER SESSIONS	9:45 AM	10:10 AM	10:35 AM
Exams Chair: **Room: Providence Ballroom A (Omni)**	**A Study of the Effects of Oral Proficiency Exams in Introductory Programming Courses on Underrepresented Groups** Scott J. Reckinger, Shanon M. Reckinger, *University of Illinois Chicago*	**Lessons Learned from Asynchronous Online Assessment Formats in CS0 and CS3** Connor McMahon, Bojin Yao, Justin Yokota, Dan Garcia, *University of California, Berkeley*	**Are We Fair? Quantifying Score Impacts of Computer Science Exams with Randomized Question Pools** Max Fowler, David H. Smith, Chinedu Emeka, Matthew West, Craig Zilles, *University of Illinois at Urbana-Champaign*
TOCE Highlights 1 Chair: **Room: Providence Ballroom II/III (Omni)**	**Psychometric Evaluation of the Cybersecurity Concept Inventory** Seth Poulsen, Geoffrey L. Herman, *University of Illinois at Urbana-Champaign*; Peter A. H. Peterson, *University of Minnesota Duluth*; Enis Golaszewski, Akshita Gorti, Linda Oliva, Travis Scheponik, Alan T. Sherman, *University of Maryland, Baltimore County*	**High School Calculus and Computer Science Course Taking as Predictors of Success in Introductory College Computer Science** Chen Chen, *Harvard-Smithsonian Center for Astrophysics*; Jane M. Kang, *Harvard Graduate School of Education*; Gerhard Sonnert, *Harvard College Observatory*; Philip M. Sadler, *Harvard-Smithsonian Center for Astrophysics*	**CSF2: Formative Feedback in Autograding** Georgiana, Haldeman, Monica Babes Vroman, Andrew Tjang, Thu Nguyen, *Rutgers University*
IDEA: Understanding Variation in Experiences Chair: **Room: Narragansett Ballroom A (Omni)**	**Additional Evidence for the Prevalence of the Impostor Phenomenon in Computing** Angela Zavaleta Bernuy, *University of Toronto*; Anna Ly, *University of Toronto Mississauga*; Brian Harrington, *University of Toronto Scarborough*; Michael Liut, Andrew Petersen, *University of Toronto Mississauga*; Sadia Sharmin, *University of Toronto*; Lisa Zhang, *University of Toronto Mississauga*	**BEST PAPER** Computing Education Research **A Demographic Analysis on Prerequisite Preparation in an Advanced Data Structures Course** Sophia Krause-Levy, Sander Valstar, Leo Porter, William G. Griswold, *University of California San Diego*	**Assessing Workload Perception in Introductory Computer Science Projects using NASA-TLX** Naser Al Madi, Siyuan Peng, Tamsin Rogers, *Colby College*
Considering Math Chair: **Room: Narragansett Ballroom B (Omni)**	**Teach More, Not Less Computability Theory in CS202X: A Case for Teaching Multiple Representations of the Church-Turing Thesis** Richard Blumenthal, *Regis University*	**An LGBTQ-Inclusive Problem Set in Discrete Mathematics** Trysten Scott Richard, Eliane S. Wiese, Zvonimir Rakamaric, *University of Utah*	**Exploring Math + CS in a Secondary Education Methods Course** Paris Kalathas, Jennifer Parham-Mocello, Rebekah Elliot, Elise Lockwood, *Oregon State University*

Saturday, March 5

Paper Sessions • 9:45 am - 10:35 am

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Cultivating a Security Mindset Chair: **Room: Narragansett Ballroom C (Omni)**	**Criminal Investigations: An Interactive Experience to Improve Student Engagement and Achievement in Cybersecurity Courses** John Grady Hall, Abhinav Mohanty, Pooja Murarisetty, Ngoc Diep Nguyen, Julio César Bahamón, Harini Ramaprasad, Meera Sridhar, *University of North Carolina at Charlotte*	**Identifying Gaps in the Secure Programming Knowledge and Skills of Students** Jessica Lam, Elias Fang, *University of California, San Diego*; Majed Almansoori, Rahul Chatterjee, *University of Wisconsin - Madison*; Adalbert Gerald Soosai Raj, *University of California, San Diego*	**HELO DarkSide: Breaking Free From Katas and Embracing the Adversarial Mindset in Cybersecurity Education** TJ OConnor, *Florida Institute of Technology*

Panel, Special, and Supporter Sessions • 9:45 am - 10:35 am

Special Session **Room: 556 A/B** (Streaming Room)	**SIGCSE Reads 2022: Using Challenging Stories in your Classroom** Rebecca Bates, *Minnesota State University*, Mankato; Emanuelle Burton, *University of Illinois at Chicago*; Valerie Summet, *Rollins University*; Nanette Veilleux, *Simmons University*; Judy Goldsmith, *University of Kentucky*
Special Session **Virtual Room:** (Streaming Room)	**(Virtual Session) CC2020 Visualization Tool** Alison Clear, *Eastern Institute of Technology*; Ernesto Cuadros-Vargas, *Universidad San Ignacio de Loyola*; Shingo Takada, *Keio University*
Panel Session **Room: 552 A/B** (Streaming Room)	**(Virtual Session) Code Red: Culturally Revitalizing Computing Courses in Native American-Serving Schools** Frieda McAlear, *Kapor Center*; Ian Her Many Horses, *University of Colorado Boulder*; Marie Casao, *American Indian Science and Engineering Society*; Rebecca Luebker, *Haas Hall Academy*
Panel Session **Room: 555 A/B** (Streaming Room)	**How and Why to Create a Departmental BPC Plan** Allyson Kennedy, *National Science Foundation*; Colleen M. Lewis, *University of Illinois at Urbana-Champaign*; Manuel A. Pérez Quiñones, *University of North Carolina at Charlotte*; Michelle Rogers, *National Science Foundation*; Burçin Tamer, *Computing Research Association*; Luther Tychonievich, *University of Virginia*
CodeGrade Supporter Session **Room: 551 A/B**	**Scaling and Automating An Online Master's Degree in Data Science at Eastern University** Dr. Greg Longo, Youri Voet, *CodeGrade*

Lightning Talks • 9:45 am - 10:35 am

3:00 pm - 3:35 pm Room: 554 A/B	**Lightning Talks #2** *(See page 00 for complete listing of Lightning Talks)*

Demos • 9:45 am - 10:35 am

9:45 am - 10:35 am Room: Exhibit Hall C/D	**Demo Session #5: Selected Topics** Chairs: Lina Battestilli, *North Carolina State University;* Jennifer Campbell, *University of Toronto* **CoLab.online: Reducing the Stress of Collaborative Work for You and Your Teams** Micah Gideon Modell, *Mount Saint Mary College* **TuneScope: Engaging Novices to Computational Thinking through Music** N. Rich Nguyen, Harsh Padhye, Eric Stein, Glen Bull, *University of Virginia* **DSLP: A Web-based Data Science Learning Platform to Support DS Education for Non-Computing Majors** Xumin Liu, Erik Golen, Rajendra K. Raj, *Rochester Institute of Technology*

Saturday, March 5

Break & Exhibits & NSF Showcase • 10:35 am - 11:25 am

10:35 am - 11:25 am Room: Exhibit Hall C/D	**Break & Exhibits** ***(Exhibit Hall Open 10:00 am - 12:30 pm)***
	NSF Showcase #5 *(See page 00 for complete listing of NSF Showcases)*

Poster Session • 10:35 am - 12:30 pm

See page 00 for Poster Session #3 Virtual

10:35 am - 12:30 pm Room: Exhibit Hall C/D	**Poster Session #3** *(See pages 00-00 for complete listing of Posters)* Chairs:

Paper Sessions • 11:15 am - 12:30 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
Collaboration: Team Formation Chair: **Room: 554 A/B**	**Comfortable Cohorts and Tractable Teams: Making Large Computing Theory Courses Feel Small** Nathan Brunelle, David Evans, *University of Virginia*		
Higher Ed Faculty Development Chair: **Room: 555 A/B (Streaming Room)**	**Training Computing Educators to Become Computing Education Researchers** Jeffrey C. Carver, *University of Alabama*; Sarah Heckman, *North Carolina State University*; Mark Sherriff, *University of Virginia*	**A Time-Optimized Content Creation Workflow for Remote Teaching** Sebastian Hofstätter, Sophia Althammer, Mete Sertkan, Allan Hanbury, *TU Wien*	**Professional Development and Support for POGIL in Computer Science** Clif Kussmaul, *Green Mango Associates, LLC*; Helen H. Hu, *Westminster College*; Patricia B. Campbell, *Campbell-Kibler Associates, Inc*; Chris Mayfield, *James Madison University*; Aman Yadav, *Michigan State University*
Training and Deploying Teaching Assistants Chair: **Room: Narragansett Ballroom B (Omni)**	**Training Teaching Assistants by Offering an Introductory Course** Emma Riese, Viggo Kann, *KTH Royal Institute of Technology*	**Designing TA Training for CS Graduate Students: Remote and Self-paced Options for A Supported Introduction to Reflective Teaching** Mia Minnes, *University of California San Diego*	**Delivering Round-the-Clock Help to Software Engineering Students Using Discord: An Experience Report** Kathryn Bridson, Jeffrey Atkinson, Scott D. Fleming, *University of Memphis*
TOCE Highlights 2 Chair: **Room: Providence Ballroom II/III (Omni)**	**Hiring CS Graduates: What We Learned from Employers** Anna Stepanova, Alexis Weaver, Joanna Lahey, Gerianne Alexander, Tracy Hammond, *Texas A&M University*	**Coding Boot Camps: Enabling Women to Enter Computing Professions** Louise Ann Lyon, Emily Green, *ETR*	**Gender Diversity in Computer Science at a L arge Public R1 Research University: Reporting on a Self-Study** Monica Babeş-Vroman, Thuytien N. Nguyen, Thu D. Nguyen, *Rutgers University–New Brunswick*

Saturday, March 5

Paper Sessions • 11:15 am - 12:30 pm

PAPER SESSIONS	10:45 AM	11:10 AM	11:35 AM
IDEA: Gender Chair: **Room: Narragansett Ballroom A (Omni)**	**Anonymity: A Double-Edged Sword in a CS1 Forum?** David A. Joyner, Lily Bernstein, Ian Bolger, Maria-Isabelle Dittamo, Stephanie Gorham, Rachel Hudson, *Georgia Institute of Technology*	**Lessons Learned from Scaling Sisters Rise Up** Barbara J. Ericson, Patricia Garcia, Joi-Lynn Mondisa, *University of Michigan*	**Codewit.us: A Platform for Diverse Perspectives in Coding** Kevin Buffardi, Elena Harris, *California State University, Chico*; Richert Wang, *University of California, Santa Barbara*
Cybersecurity Teaching Tools Chair: **Room: Narragansett Ballroom B (Omni)**	**Evaluating Two Approaches to Assessing Student Progress in Cybersecurity Exercises** Valdemar Švábenský, *Masaryk University*; Richard Weiss, *The Evergreen State College*; Jack Cook, New York University; Jan Vykopal, *Masaryk University*; Pavel ȿeleda, *Masaryk University*; Jens Mache, *Lewis & Clark College*; Radoslav Chudovský, *Masaryk University*; Ankur Chattopadhyay, *Northern Kentucky University*	**Design and Use of a Visualization for Teaching Integer Coercion** Steven Carr, *Western Michigan University*; Yu Chin Cheng, *National Taipei University of Technology*; Yu-Hsiang Hu, *National Taipei University of Technology*; Jean Mayo, *Michigan Technological University*; Ahmed Radwan, *Western Michigan University*; Ching-Kuang Shene, *Michigan Technological University*; James Walker, *Michigan Technological University*	**EdGENI: Making GENI User-Friendly for General Computer Education** Yongzhi Wang, Wen-Jung Hsin, *Manish Lamsal, Park University*
Service Learning Chair: **Room: Providence Ballroom I/IV (Omni)**	**Department-wide Multi-semester Community Engaged Learning Initiative to Overcome Common Barriers to Service-Learning Implementation** Kathleen Timmerman, Michael Goldweber, *Xavier University*	**BEST PAPER** Position and Curricula Initiatives **A Framework for Socially-Relevant Service-Learning Internship Experiences for High School Students** Veronica Cateté, Amy Isvik, Marnie Hill, *North Carolina State University*	**Why Should Computer and Information Science Programs Require Service Learning?** Mia Kilkenny, Christopher Lynnly Hovey, Fujiko Robledo Yamamoto, Amy Voida, Lecia Barker, *University of Colorado Boulder*

Panel, Special, and Supporter Sessions • 11:15 am - 12:30 pm

Panel Session 07 **Room: 552 A/B**	**Undergraduate Course Assistant Autonomy in Course Development and Teaching** Adam Blank (California Institute of Technology); Dan Garcia (University of California, Berkeley); Christine Alvarado (University of California, San Diego); Zach Dodds (Harvey Mudd College
Special Session 09 **Room: Virtual Room**	VIRTUAL SESSION **Exploring Lightweight Practices to Support Students' Well-being** Oluwakemi Ola, *University of British Columbia*; Brian Harrington, *University of Toronto Scarborough*

Saturday, March 5

Nifty Assignmnts • 10:35 am - 12:30 pm

11:15 am - 12:30 pm Room: 556 A/B (Streaming Room)	**Nifty Assignments** **Two-Dimensional Ray Marching** L. Joshua Crotts, *University of North Carolina Greensboro*; Andrew Matzureff, *NA* **Food Webs or the Zombie Apocalypse** Ben Stephenson, Jonathan Hudson, *University of Calgary* **Reddit Bot** Mike Izbicki, *Claremont McKenna College* **Handwriting Recognizer** Stephanie Valentine, *University of Nebraska-Lincoln* **Nifty Assignments: Spelling Bee** Eric Roberts, *Stanford University*; Jed Rembold, *Willamette University* **Bias Bars** Juliette Woodrow, Kathleen Creel, Nick Bowman, *Stanford University*

Closing Ceremonies • 12:30 pm - 2:00 pm

12:30 pm - 2:00 pm Room: Ballroom A-E	**Lunch & Closing Ceremonies**

Saturday Workshops • 3:00 pm - 6:00 pm

Workshop 401 **Room: 551 A/B**	**Autograders for Novice Programmers** Chad Hogg, *Millersville University*; Maria Jump, *Northeastern University*
Workshop 402 **Room: 553 A/B**	**Beauty and Joy Computing: AP CS Principles & Middle School Curriculum** Michael Ball, Lauren Mock, Dan Garcia, *University of California, Berkeley*; Tiffany Barnes, Marnie Hill, *North Carolina State University*; Mary Fries, *Education Development Center*; Pamela Fox, *University of California, Berkeley*; Yuan Garcia, *Millbrae High School*
Workshop 403 **Room: 554 A/B**	**Free Ebooks for Computer Science Courses: Now With Support for Peer Instruction, Choice Questions, and Exam Generation** Barbara J. Ericson, *University of Michigan*; Bradley N. Miller, *Runestone Academy*
Workshop 404 **Room: 552 A/B**	**Introducing Data Science Topics to Non-computing Majors** Xumin Liu, Erik Golen, Rajendra Raj, *Rochester Institute of Technology*
Workshop 405 **Room: 555 A/B**	**Computer Science Frontiers: New Curricula to Advance Female Interest in Computing** Veronica Cateté, Lauren Alvarez, *North Carolina State University*; Shuchi Grover, *Looking Glass Ventures & Stanford University*; Isabella Gransbury, *North Carolina State University*; Brian Broll, *Vanderbilt University*; Madeline Drayton, *Providence High School*; Audrey Coats, *Lynnfield High School*; April Collins, *MLK Jr. High School*; Ákos Lédeczi, *Vanderbilt University*; Tiffany Barnes, *North Carolina State University*
Workshop 406 **Room: 556 A/B**	**Adaptable Toolkits for CS Mentoring Programs in Academia and Industry** Audrey St. John, *Mount Holyoke College*; Margaret Price, *Microsoft Corporation*; Becky Wai-Ling Packard, *Mount Holyoke College*
Workshop 407 **Room: Providence Ballroom I/IV (Omni)**	**Advancing Your Arduino Game: Early and Engaging Scaffolding for Advanced CS** Roger D. Chamberlain, James Orr, Doug Shook, Bill Siever, *Washington University in St. Louis*
Workshop 408 **Room: Providence Ballroom II/III (Omni)**	**Integrating Parallel and Distributed Computing in Early CS Courses** Sheikh Ghafoor, *Tennessee Technological University*; Sushil Prasad, *University of Texas San Antonio*; Charles Weems, *University of Massachusetts Amherset*

For a full list of workshops and descriptions visit: ***http://sigcse2022.sigcse.org/attendees/workshops.html***

SIGCSE 2022
Virtual Sessions & Events

This year some papers at the Technical Symposium are being presented virtually. For these Thematic Groups, attendees can access pre-recorded video presentations through the conference platform. Authors will be available for questions and interaction with attendees during different "Author Corner" timeslots throughout the conference. Details about when to find an author in the virtual space are posted alongside the prerecorded video in the conference platform

Detailed information on virtual sessions, viewing times and Author's Corner timeslots will be available at the reservation desk at the symposium as well as on the SIGCSE website and the conference mobile app

VIRTUAL Thematic Groups

Instructional Strategies **Room: Virtual**	**The Impact of Optional Groups on Students** Jonathan Calver, Jennifer Campbel, Michelle Craig, Jonathan Lam, *University of Toronto* **Experiences Implementing and Utilizing a Notional Machine in the Classroom** Paul E. Dickson, *University at Buffalo*; Tim Richards, *University of Massachusetts Amherst*; Brett A. Becker, *University College Dublin*	**"Run Wild a Little With Your Imagination": Ethical Speculation in Computing Education with Black Mirror** Shamika Klassen, Casey Fiesler, *University of Colorado Boulder* **Play Your Cards Right: Using Quantitative Card-Sort Data to Examine Students' Pattern-Like Concepts** James Finnie-Ansley, Paul Denny, Andrew Luxton-Reilly, *The University of Auckland*	**Design Recommendation for Using Textual Aids in Data-Science Programming Courses** Heeryung Choi, *University of Michigan*; Caitlin Mills, *University of New Hampshire*; Christopher Brooks, *University of Michigan*; Stephen Doherty, *University of New South Wales*; Anjali Singh, *University of Michigan* **Exploration on Integrating Accessibility into an AI Course** Chia-En Tseng, Seoung Ho Jung, Yasmine N. Elglaly, Yudong Liu, *Western Washington University*; Stephanie Ludi, *University of North Texas*
Interventions **Room: Virtual**	**BEST PAPER** Computing Education Research **Time-on-Task Metrics for Predicting Performance** Juho Leinonen, *Aalto University*; Francisco Enrique Vicente Castro, *University of Massachusetts Amherst*; Arto Hellas, *Aalto University* **Retrieval-based Teaching Incentivizes Spacing and Improves Grades in Computer Science Education** Iman YeckehZaare, Chloe Aronoff, *University of Michigan - Ann Arbor*; Gail Grot, *San Jose State University*	**Evaluation of the Use of Growth Mindset in the Computer Science Classroom** Daehan Kwak, Patricia Morreale, *Kean University*; Sarah T. Hug, *Colorado Evaluation & Research Consulting*; Yulia Kumar, Jean Chu, Ching-Yu Huang, J. Jenny Li, Paoline Wang, *Kean University*	**A Comparison of Immediate and Scheduled Feedback in Introductory Programming Projects** Juho Leinonen, *Aalto University*; Paul Denny, *The University of Auckland*; Jacqueline Whalley, *Auckland University of Technology*

VIRTUAL Thematic Groups

Programmatic Considerations **Room: Virtual**	**How to Integrate Environmental Challenges in Computing Curricula?** Anne-Laure Ligozat, *Université Paris-Saclay*, CNRS, ENSIIE, LISN; Kevin Marquet, *Univ Lyon, INSA Lyon, Inria, CITI, EA3720*; Aurélie Bugeau, *Univ. Bordeaux, CNRS, Bordeaux INP, LaBRI, UMR5800*; Julien Lefèvre, *Aix Marseille Univ, CNRS, INT, Inst Neurosci Timone*; Pierre Boulet, *Univ. Lille, CNRS, Centrale Lille, UMR 9189 CRIStAL*; Sylvain Bouveret, *Univ. Grenoble-Alpes, CNRS, Grenoble INP, LIG*; Philippe Marquet, *Univ. Lille, CRIStAL, UMR 9189*; Olivier Ridoux, *Univ. Rennes, Inria, CNRS, IRISA*; Olivier Michel, *Université Paris Est - Créteil, LACL, EA 4219*	**Interpreting the ABET Computer Science Criteria Using Competencies** Rajendra K. Raj, *Rochester Institute of Technology*; Amruth N. Kumar, *Ramapo College of New Jersey*; Mihaela Sabin, *University of New Hampshire*; John Impagliazzo, *Hofstra University*	**Another Victim of COVID-19: Computer Science Education** Iman YeckehZaare, *University of Michigan - Ann Arbor*; Gail Grot, *San Jose State University*; Isadora Dimovski, *University of Michigan - Ann Arbor*; Karlie Pollock, *Haverford College*; Elijah Fox, *University of Michigan - Ann Arbor*
	A Four-year Study of a Placement Exam for an Introductory Programming Course Stefan Podlipnig, *TU Wien*	**Barriers to New Zealand High School CS Education - Learners' Perspectives** Chamindi K. Samarasekara, Claudia Ott, Anthony Robins, *University of Otago*	**How Creatively Are We Teaching and Assessing Creativity in Computing Education: A Systematic Literature Review** Wouter Groeneveld, *KU Leuven*; Brett A. Becker, *University College Dublin*; Joost Vennekens, *KU Leuven*
The Novice Programmer **Room: Virtual**	**Code Quality Defects Across Introductory Programming Topics** Tomáš Effenberger, Radek Pelánek, *Masaryk University*	**Novice Reflections During the Transition to a New Programming Languag** Paul Denny, *The University of Auckland*; Brett A. Becker, *University College Dublin*; Nigel Bosch, *University of Illinois*; James Prather, Brent Reeves, *Abilene Christian University*; Jacqueline Whalley, *Auckland University of Technology*	**What Fails Once, Fails Again: Common Repeated Errors in Introductory Programming Automated Assessments** Simon Caton, Seán Russell, Brett A. Becker, *University College Dublin*
	Sympathy for the (Novice) Developer: Programming Activity When Compilation Mechanism Varies Simon Caton, Seán Russell, Brett A. Becker, *University College Dublin*		

Virtual Sessions

VIRTUAL Thematic Groups

Tools

Room: Virtual

A Learner-Centered Technique for Collectively Configuring Inputs for an Algorithmic Team Formation Tool

Emily M. Hastings, Sneha R. Krishna Kumaran, Karrie Karahalios, Brian P. Bailey, *University of Illinois at Urbana-Champaign*

Effective Succinct Feedback for Intro CS Theory: A JFLAP Extension

Ivona Bezáková, *Rochester Institute of Technology*; Kimberly Fluet, *University of Rochester*; Edith Hemaspaandra, Hannah Miller, *Rochester Institute of Technology*; David E. Narváez, *University of Rochester*

Scratch and Sense: Using Real-Time Sensor Data to Motivate Students Learning Scratch

Hussel Suriyaarachchi, Paul Denny, Suranga Nanayakkara, *The University of Auckland*

Online Tutorial Tools to Practice Data Representation

Bin Peng, *Park University*

Intelligent Support for All? A Literature Review of the (In)equitable Design & Evaluation of Adaptive Pedagogical Systems for CS Education

Alexia Charis Martin, Kimberly Michelle Ying, *University of Florida*; Fernando J. Rodríguez, *University of Utah*; Christina Suzanne Kahn, Kristy Elizabeth Boyer, *University of Florida*

TOCE Virtual 1

Room: Virtual

Parental Involvement in Computer Science Education and Computing Attitudes and Behaviours in the Home: Model and Scale Development

Nina Bresnihan, Aibhín Bray, Lorraine Fisher, Glenn Strong, Richard Millwood, Brendan Tangney, *University of Dublin*

An Empirical Study of Students' Perceptions on the Setup and Grading of Group Programming Assignments

Efthimia Aivaloglou, *Leiden Institute of Advanced Computer Science, The Netherlands and Open Universiteit, The Netherlands*; Anna van der Meulen, *Leiden Institute of Advanced Computer Science, The Netherlands*

Applying a Transformative Justice Approach to Encourage Participation of Black and Latina Girls in Computing

Sheena Erete, *DePaul University*; Karla Thomas, *Northwestern University*; Denise Nacu, Jessa Dickinson, *DePaul University*; Naomi Thompson, Nichole Pinkard, *Northwestern University*

"Los programadores debieron pensarse como dos veces": Exploring the Intersections of Language, Power and Technology with Bi/Multilingual Students

Sara Vogel, *New York University*

TOCE Virtual 2

Room: Virtual

Beyond Programming: A Computer-Based Assessment of Computational Thinking Competency

Rina Lai, *University of Cambridge*

Towards a Framework for Teaching Artificial Intelligence to a Higher Education Audience

Becky Allen, Andrew Stephen McGough, Marie Devlin, *Newcastle University*

Cognitive Load Theory in Computing Education Research: A Review

Rodrigo Duran, Federal Institute of Mato Grosso do Sul and Aalto University; Albina Zavgorodniaia, Juha Sorva, *Aalto University*

Virtual Sessions

IMPORTANT INFORMATION FOR VIRTUAL PRESENTATIONS:

Virtual Birds of a Feather will take place synchronously during one of two timeslots. All conference participants can join these interactive online discussions by logging into the conference platform at the times below.

Virtual Poster Sessions will take place synchronously for remote presenters at the time indicated below. All conference participants can interact with virtual poster presenters by logging into the conference platform.

Detailed information for logging into the conference virtual platform will be available at the registration desk, on the conference mobile app and on the SIGCSE websire.

All times are listed in the US Eastern time zone.

Virtual Birds of a Feather • Thursday

5:30 pm - 6:20 pm Virtual Room	**Birds of a Feather Flock C Virtual** *(See page 00 for complete list of Birds of a Feather)* Chairs: Mary Anne Egan, *Siena College;* Dale-Marie Wilson, *University of North Carolina at Charlotte*
6:30 pm - 7:20 pm Virtual Room	**Birds of a Feather Flock D Virtual** *(See page 00 for complete list of Birds of a Feather)* Chairs: Mary Anne Egan, *Siena College;* Dale-Marie Wilson, *University of North Carolina at Charlotte*

Virtual Poster Session • Friday

3:00 pm - 5:00 pm Room: Virtual Room	**Poster Session #4 Virtual** *(See pages 00-00 for complete listing of Posters)* Chairs:

Virtual Student Research Competition • Friday

3:00 pm - 3:45 pm Room: Providence Ballroom I/IV (Omni)	**Virtual Student Research Competition- Undergraduate** *(See page 00 for complete SRC listing)*
3:00 pm - 3:45 pm Room: Providence Ballroom II/III (Omni)	**Virtual Student Research Competition- Graduate** *(See page 00 for complete SRC listing)*

Virtual Poster Session • Saturday

10:35 am - 12:30 pm Virtual Room	**Poster Session #3 Virtual** *(See pages 00-00 for complete listing of Posters)* Chairs:

Virtual Lightning Talks • Saturday

3:00 pm - 3:35 pm **Room: 554 A/B**	**Lightning Talks #3 Virtual** *(See page 00 for complete listing of Lightning Talks)*

Supporter Sessions

Wednesday, March 2

Presented courtesy of ***Google***

Technical Writing for All Students

▶ **8:30 am - 12:00 pm**
Room: 554 A/B

Presenters: Presenters: Barry Rosenberg, Tina Ornduff, *Google*

Most engineering students don't realize that professional engineers spend much of their day writing. Communicating clearly and efficiently is often the key difference between a mediocre engineering career and a great engineering career. In 2015, Google created technical writing courses specifically aimed at software engineers. To everyone's surprise, these courses became popular. In fact, more than half of all Google software engineers have now taken at least part of a technical writing course. In 2020, Google released free versions of these courses externally. During this session, Barry Rosenberg and Tina Ornduff--two of the courses' creators--will describe the available resources and answer your questions about teaching technical writing principles to CS students.

Presented courtesy of ***ABET***

How Should CS Programs Balance First-Job Readiness and Foundations for Long-Term Career Success?

▶ **8:30 am - 12:00 pm**
Room: 553 A/B

Presenters: Rajendra K. Raj, *Rochester Institute of Technology*, Stephanie Smullen, *The University of Tennessee at Chattanooga - retired*

It has been a long standing tradition for employers to complain that CS graduates lack many Day-1 job-readiness skills and for faculty to insist that academic programs should focus on long-lasting foundational material instead of trying to satisfy the multitude of short-term employer needs. If a CS undergraduate program was designed by employers of CS graduates, it would look considerably different from today's academia-designed programs, as shown in the parallel education computing programs now being offered by several employers. This session asks several questions relevant to CS curricula: Is there a middle ground? Is there a principled approach to addressing the balance? How does one balance foundational concepts with practical skills? How would we know what is effective and what is not? Come join the discussion and participate in a workshop that will not only feature industry panelists but also a hands-on design component.

Presented courtesy of ***Microsoft***

Microsoft MakeCode Sampler Pack!

▶ **1:30 pm - 5:00 pm**
Room: 551 A/B

Presenter: Jacqueline Russell, *Microsoft????*

Looking for some high-engagement options for teaching CS? Join us for a fun, hands-on workshop where we'll take a tour around MakeCode – exploring physical computing with the micro:bit, game development with MakeCode Arcade, and game modding with Minecraft! We will walk through step-by-step coding challenges and build projects together that you can use in the classroom. This is a beginner-level workshop – no prior experience required. Attendees should bring a smile and a laptop to the session. Please note: this workshop will only be hosted in person.

Thursday, March 3

Presented courtesy of ***GitHub***

GitHub Global Campus: The New Home for Teachers and Developers

▶ **10:45 am - 12:00 pm**
Room: 553 A/B

Presenters: Eric Rosad, Ashley Bass, *GitHub Education*, David J. Malan, *Harvard University*

The GitHub Education Team would like to welcome the teacher and student community to GitHub Global Campus! Global Campus is the new home for all our current and future teacher and student programs and allows us to better serve our growing community of 1.7+ million. You can use the Global Campus portal to connect with the community, find access to industry tools, learn about new events, and see assigned coursework—all in one place! Plus, a look at how CS50, Harvard University's introductory course in computer science, is using Git with GitHub Actions, GitHub Classroom, GitHub Codespaces, and GitHub REST APIs to support hundreds of students on campus and thousands of students online.

Supporter Sessions

Thursday, March 3

Presented courtesy of ***Microsoft***

ElectionGuard: Allowing Voters to Confirm That Their Votes are Correctly Counted

▶ **10:45 am - 12:00 pm**
Room: 551 A/B

Presenters: Josh Benaloh, *Microsoft Research*

Presenter: Josh Benaloh, Microsoft Research
Microsoft's ElectionGuard is a free, open-source toolkit that is being used by election equipment vendors to produce "end-to-end verifiable" elections. In these elections, voters can confirm on their own that their votes are correctly counted – without having to trust election officials, equipment vendors, or anyone else. Any and all tampering with votes and tallies – even insider tampering – becomes detectable by candidates, parties, news media, and even individual voters. Independent election verification apps can be written to check the accuracy and consistency of publishes election records.

This tutorial will describe how ElectionGuard works and how student projects can be fashioned to write independent ElectionGuard verifiers or work with the code in other ways.

Presented courtesy of ***Google***

Getting More From Google: Engaging with Google's CS Education Programs

▶ **1:45 pm - 3:00 pm**
Room: 551 A/B

Presenters: Kim Roberts, Kyle Ali, Nicki Anselmo, Sidnie Davis, Shanika Hope, Tina Ornduff, *Google*

As the impact of current CS advocacy efforts roll out across U.S. states and internationally, there is increasing need for all levels of education to work together to address common needs and challenges. This session will provide participants with an opportunity to hear from leads for a wide variety of solution-oriented programs from Google. The broad array of interventions and resources will include high-school to undergraduate transitional programs, the growing importance of self-driven learning opportunities, new research on social capital, efforts to diversify the CS education research community, and new thinking on how Google can better connect with our ecosystem partners.

Presented courtesy of ***Wiley and zyBooks***

How a Deep-dive Analysis of Your Class zyBook Can Improve Your Course and Reduces Cheating

▶ **1:45 pm - 3:00 pm**
Room: 553 A/B

Presenters: Chelsea Gordon, *zyBooks, A Wiley Brand*, Frank Vahid, *zyBooks, A Wiley Brand/University of California, Riverside*, Roman Lysecky, *zyBooks, A Wiley Brand*

zyBooks creates web-native textbooks that improve learning outcomes with concise text and interactive content. 250,000+ students each year learn Python, Java, Discrete Math, and more. zyBooks researchers can partner with you on a deep dive into your zyBook activity data, comparing with national averages, highlighting areas of concern (e.g., are your students struggling more than typical?), and to show what correlates most with their final grades/exams in your class (e.g., is time spent on labs a key predictor?). The analysis can also help cheating in your class, with specific techniques suggested to reduce it (and measured to see impact). Join us to learn more about zyBooks course analytics and deep-dive analyses, to help improve student learning in your course.

Presented courtesy of ***NSF***

TBD

▶ **3:45 pm - 5:00 pm**
Room: 551 A/B

Presenter:

Description to come.

Supporter Sessions

Thursday, March 3

Presented courtesy of ***Gradescope by Turnitin***

TBD

▶ **3:45 pm - 5:00 pm**
Room: 553 A/B

Presenter:

Description to come..

Presented courtesy of ***Abet***

An Update on ABET Accreditation Criteria

▶ **5:30 pm - 6:20 pm**
Room: 551 A/B

Presenters: Rajendra K. Raj, *Rochester Institute of Technology*, Stephanie Smullen, *The University of Tennessee at Chattanooga - retired*

The session will be led by Rajendra K. Raj and Stephanie Smullen, who are current members of the Executive Committee of ABET's Computing Accreditation Commission. Raj is a professor of computer science at RIT and serves as the 2021-22 chair of the commission. Smullen is a professor of computer science at UT Chattanooga (retired), and currently chairs the commission's Diversity, Equity, and Inclusion Criteria Subcommittee. Both have decades of experiences leading ABET site visits and coordinating their own programs' ABET reviews.

Presented courtesy of ***Replit***

Collaborative Coding with Replit: Zero-Setup Online Coding for Any Device

▶ **5:30 pm - 6:20 pm**
Room: 553 A/B

Presenter: Lena Vu Sawyer, *Replit*

Learn how Replit can help you unlock seamless, collaborative, and accessible coding experiences for your students! Replit is a zero-configuration real-time coding environment for any device. Replit Teams for Education presents an opportunity for instructors from all backgrounds to spend more time engaged in teaching than troubleshooting student environments and tediously sharing code. Attendees will experience first-hand how students can work together through Replit's collaborative coding environment and how to leverage Replit's unique technologies in their teaching practice. Lena Vu Sawyer is the head of Community at Replit and a digital learning educator and artist. She hopes to empower people to make their mark on our digital world.

Presented courtesy of ***Pearson***

Pearson's Revel for Online and Hybrid Programming Courses: Implementation and Increasing Student Success

▶ **6:30 pm - 7:20 pm**
Room: 551 A/B

Presenter:

Revel is Pearson's unique learning platform designed to encompass text, video, and interactives in one environment thoughtfully designed to improve learning outcomes for students in programming courses. We will share educator implementation strategies for using Revel to teach online with Python, Java and C++ in distance, hybrid, and in-person orientations. You will also hear about Pearson's Efficacy Report on using Revel to teach introductory programming concepts and how it determined additional success metrics for students who engaged in active learning and coding practices. See firsthand how students can start to code in the early stages of the course and receive immediate feedback if their submissions were correct or need further refinement.

Presented courtesy of ***MongoDB***

Strategies to Streamline Modern Database Education with MongoDB

▶ **0:00 pm - 0:00 pm**
Room:

Presenters: Julianna Chen, Sarah Maibach, Lieke Boon, *MongoDB*

Looking to equip your students with up-to-date database knowledge and skills? Interested in resources and strategies to enhance database teaching and learning in computer science, data science and related fields? In this interactive session, we'll share curriculum materials and educational resources offered by MongoDB for Academia and highlight key learnings from educators incorporating non-relational databases in their teaching. Bring your questions.

Supporter Sessions

Friday, March 4

Presented courtesy of ***Google***

Supporting Diverse, Equitable, and Inclusive Student Research in Computing

▶ **10:45 am - 12:00 pm**
Room: 551 A/B

Moderator: Sloan Davis
Panelists: TBA) are all university faculty who are exploreCSR award recipients

Enrollment in CS PhD programs of students who identify as Black, Indigenous, Latino, nonbinary and/or women increased 19% from 2019 to 2020 in the US and Canada, but these students still only comprise 12% of all enrollments. Google Research provides a variety of programs and partnerships that aim to address this inequity through support and collaborations for undergraduates, graduate students, and academic researchers and faculty. In this session, we'll describe constraints and opportunities in broadening participation in computing research, our efforts, and the learnings they've produced. Current and past principal investigators of exploreCSR will join us for a panel to describe their experiences and field questions about how they've developed expository computing research initiatives and how they might translate into departmental BPC plans.

Presented courtesy of ***Microsoft***

AP Computer Science Principles with Microsoft MakeCode & TEALS

▶ **10:45 am - 12:00 pm**
Room: 553 A/B

Presenters: Jacqueline Russell, TBD, *TEALS representative*

AP CS Principles has proven to be one of the most inclusive, equitable introductory CS courses for high school students. Join us as we explore this free, online curriculum with MakeCode Arcade – a highly engaging game development platform. This curriculum was designed to be taught by any educator, regardless of experience level. And for new CS teachers, learn more about the TEALS program for additional in-classroom support. TEALS volunteers are trained on the AP CS Principles curriculum and can help be your CS classroom buddy! There will be the opportunity to do some hands-on coding as we explore the lessons, so we welcome attendees who want to bring laptops and follow along.

Presented courtesy of ***GitHub***

Scale your classroom with GitHub Classroom and Codespaces

▶ **1:45 pm - 3:00 pm**
Room: 551 A/B

Presenters: Katherine Kampf, *GitHub Education*, Filisha Shah, *Microsoft*

Using GitHub for your course instruction can help scale and automate your coursework, while also prepping students for industry by teaching them real-world tools. Additionally, the crucial first few weeks of a course are often lost to helping students get set up with their dev environment. In this session, we will cover how to use GitHub Classroom and Codespaces to make you and your students' lives simpler by streamlining environment set-up with Codespaces and simplifying assignment distribution with Classroom.

Presented courtesy of ***Codio***

Easily Adopt Research-based Teaching Practices at Scale

▶ **1:45 pm - 3:00 pm**
Room: 553 A/B

Presenters: Elise Deitrick, *Codio*

Enjoying learning about research-based pedagogy but wondering how to implement it in your computing classroom? Codio helps you adopt evidence-based tools and approaches such as (1) editable, interactive, minimal text content, (2) a wide range of assessment tools that offer instant, elaborated feedback, (3) code visualization, (4) parsons problems, and (5) paired or mob programming. Codio simultaneously addresses many logistical concerns such as (1) accessibility, (2) cloud-based, instructor or pre-configured containers, (3) LMS integration, (4) in-line code comments and rubrics for manual feedback, (5) code playback to understand students' programming process, (6) automated email nudging for students and (7) instructor-facing data visualizations to help identify struggling students.

Supporter Sessions

Friday, March 4

Presented courtesy of ***Rephactor***

The Online Textbook That You and Your Students Will Love

▶ **3:45 pm - 5:00 pm**
Room: 551 A/B

Presenters: Tom Way, John Lewis, *Rephactor*

Rephactor is an interactive, extensively customizable, and beautiful online textbook for introductory Java and Python courses. Come to this session to find out more and bring your laptop to try it live. We all know that interactivity engages students and improves learning. Discover how Rephactor takes that to the next level. A Rephactor book includes hundreds of topics designed from the ground up for online use (not a print book put on the Web). Our tools include a customizable syllabus builder, an in-topic Run & Revise code explorer, and auto-graded Quick Check quizzes and Programming Exercise sets. The instructor dashboard lets you analyze student progress, automate attendance tracking, download slides, and manage grades. With Rephactor, you'll save time and your students will learn more. Find out how Rephactor has encouraged thousands of students to explore material in a way that's both challenging and fun. Refactor your course with Rephactor!

Presented courtesy of ***Microsoft***

Core Developer Tools for Your Computer Science Classroom

▶ **3:45 pm - 5:00 pm**
Room: TBD

Presenters: Sana Ajani, Filisha Shah

A crucial amount of time during the first weeks of the school year are lost to helping students get the correct environment and tools on their machine. Still, many students may end up with a low-quality development experience. In this session, we will go over how educators can customize Visual Studio Code for their needs. We'll review specific settings, extensions for code collaboration, and experiences like our new web editor that can be used to simplify and personalize the development tools you use in your classroom.

Saturday, March 5

Presented courtesy of ***CodeGrade***

Scaling and Automating an Online Master's Degree in Data Science at Eastern University

▶ **9:45 am - 10:35 am**
Room: 551 A/B

Presenters: Dr. Greg Longo, Youri Voet, *CodeGrade*

To accommodate the growing need for Data Science, Eastern University launched their online Master's Program in Data Science in August of 2020. After seeing substantial growth in student numbers, their traditional (manual) methods of grading and assessment in D2L Brightspace did not fit anymore. Together with CodeGrade, they have automated most of their courses and in this session Dr. Greg Longo, Program Director at Eastern, and Youri Voet, CEO at CodeGrade, will walk you through the considerations, feedback and future plans for automatic and manual assessment of Data Science and Programming Education.

Birds of a Feather

Chairs:
Mary Anne Egan, *Siena College*
Dale-Marie Wilson, *University of North Carolina at Charlotte*

THURSDAY, MARCH 3
5:30 pm - 6:20 pm

Flock A

Learning Outcomes and Assessments for Ethical Computing

Room 553 A/B

Rasika Bhalerao, *New York University*; Emanuelle Burton, *University of Illinois, Chicago*; Stacy Doore, *Colby College*; Judy Goldsmith, *University of Kentucky*

Identity-Inclusive Computing: Learning from the Past; Preparing for the Future

Room 554 A/B

Alicia Nicki Washington, Shaundra Daily, *Duke University*; Cecil¬í¬© Sadler, *Massachusetts Institute of Technology*

Interdisciplinary Computing Majors (CS+X): Making It Work at Your University

Room 552 A/B

Carla E. Brodley, *Northeastern University*; Valerie Barr, *Mount Holyoke College*

A Town Meeting: SIGCSE Committee on Expanding the Women-in-Computing Community

Room 555 A/B

Gloria Childress Townsend, *DePauw University*; Paula Gabbert, *Furman University*; Wendy Powley, *Queen's University*

Retention and Transfer of Mathematical Thinking in the CS Curriculum

Room 556 A/B

Bruce W. Char, Steve Earth, *Drexel University*

Building Ecosystems of Belonging for Neurodiverse Students: A Discussion of Instructor Practices and Training Needs

Room Providence Ballroom I/IV

Rachel Bonnette, Samuel Abramovich, Adrienne Decker, *University at Buffalo*; Greg A. Fabiano, *Florida International University*

Building a Multinational Community Among Graduate Students in CS Education Research

Room Providence Ballroom II/III

Sophia Krause-Levy, *University of California, San Diego*; Melissa Perez, *University of Michigan*

Academic Middle Management: Undergraduate Leadership in Computing Programs

Room Narragansett Ballroom A

Sarah Heckman, *North Carolina State University*; Mia Minnes, *University of California, San Diego*

Understanding and Tracking Computing Instructor Identity

Room Narragansett Ballroom B

Heidi J.C. Ellis, *Western New England University*; Gregory W. Hislop, *Drexel University*

Should Quantum Processor Design be Considered a Topic in Computer Architecture Education?

Room Narragansett Ballroom C

Marcelo Pias, *Federal University of Rio Grande (FURG)*; Brett Becker, *University College Dublin*; Qiao Xiang, *Xiamen University*; Mohamed Zahran, *New York University*; Monica Anderson, *University of Alabama*

The Trials and Tribulations of Early Career Researchers Transitioning into Full-Time Teaching Tracks

Room 557

Bedour Alshaigy, *Independent*

THURSDAY, MARCH 3
6:30 pm - 7:20 pm

Flock B

What's Up, Doc? Building a Community of Computing Education Postdocs

Room 553 A/B

Francisco Enrique Vicente Castro, *University of Massachusetts Amherst & New York University*; Kathryn Cunningham, *Northwestern University*; Miranda Parker, *University of California, Irvine*; Nicholas Lytle, *University of Florida*

You Teach WHAT in Your Data Science Course?!?

Room 554 A/B

Michael A. Posner, *Villanova University*; April Kerby-Helm, *Winona State University*

Computing for Social Good on Your Campus

Room 552 A/B

Lori Postner, *Nassau Community College*; Gregory W. Hislop, *Drexel University*

Community Input and Engagement for CS202x: Data Management

Room 555 A/B

Mikey Goldweber, *Xavier University*; Sherif Aly, *The American University in Cairo*

Culturally Responsive Pedagogy in Computer Science (CR in CS)- K-12 Teacher Professional Development- Needs and Challenges

Room 556 A/B

Raena Cota, Enrico Pontelli, *New Mexico State University*; Paige Prescott, *Computer Science Alliance*; Lauren Curry, Lisa Hufstedler, *Las Cruces Public Schools*; Francis Vigil, *National Indian Education Association*; Yolanda Lozano, *Computer Science Alliance*; David Rutledge, *New Mexico State University*

Bridging the Gap between Academia and Industry in CSEd to Promote Opportunities for CSEd Grads and Research in Practice

Room Providence Ballroom I/IV

Ethel Tshukudu, *University of Glasgow*; Carolina Moreira Oliveira, *Federal University of Paraná*; Alejandra S. Méndez, *University of Puerto Rico*; Alan Peterfreund, Brianna Johnston, Stacey Sexton, *SageFox Consulting Group*

Birds of a Feather

Flock B

Community Input for CS202X: Software Engineering

Room Providence Ballroom II/III

Titus Winters, *Google*; Brett Becker, *University College Dublin*; Christian Servin, *El Paso Community College*

Coaching to Improve CS Teaching and Learning

Room Narragansett Ballroom A

Jennifer Rosato, *College of St. Scholastica*; Lien Diaz, *Georgia Tech*; Meg Ray, *Cornell Tech*; Bryan Twarek, *Computer Science Teachers Association*; Don Yanek, *Chicago Public Schools*

How to Gamify Computer Science Courses?

Room Narragansett Ballroom B

Darina Dicheva, Keith Irwin, Christo Dichev, *Winston-Salem State University*; Lillian (Boots) Cassel, *Villanova University*; Rita Ismailova, *Kyrgyz Turkish Manas University*

Communicating Alternative Grading Schemes: How to Shift Students' Attention to Their Learning from Grades

Room Narragansett Ballroom C

Sarah Brown, *University of Rhode Island*; Victoria Chávez, *Northwestern University*

Teaching Track Faculty in Computer Science

Room 557

Chris Gregg, *Stanford University*; Laney Strange, *Northeastern University*

THURSDAY, MARCH 3
5:30 pm - 6:20 pm

Flock C Virtual

Birds of a Feather Who'd Like to Share Software Together: Teaching Tools that Improve Efficiency and Outcomes

Room Virtual Room

David J. Malan, Doug Lloyd, Carter Zenke, *Harvard University*

Community Input for CS202X: Algorithms and Complexity

Room Virtual Room

Richard Blumenthal, *Regis University*; Cathy Bareiss, *Bethel University*; Mia Minnes, *University of California, San Diego*; Christian Servin, *El Paso Community College*

Diversity Includes Disability Includes Mental Illness: Expanding the Scope of DEI Efforts in Computer Science

Room Virtual Room

Jennfier Akullian, *Growth Coaching Institute*; Adam Blank, *California Institute of Technology*; Brianna Blaser, *Access Computing*; Elba Garza, *Texas A&M University*; Christian Murphy, *Bryn Mawr College*; Kendra Walther, *University of Southern California*

Mentoring a Women in Computing Student Club: The Good, The Bad, and The Ugly

Room Virtual Room

Mary Villani, Ilknur Aydin, *Farmingdale State College*

TA Competencies for Inclusive Learning Spaces

Room Virtual Room

Oluwakemi Ola, *University of British Columbia*; Jacqueline Smith, *University of Toronto*; Barbara Rotundo, *Mount Holyoke College*; Justin Hsia, *University of Washington*

Fostering a Culture of Belonging in CS Education

Room Virtual Room

Nicole Anderson, Luke Fernandez, *Weber State University*

THURSDAY, MARCH 3
6:30 pm - 7:20 pm

Flock D Virtual

Disability in Computer Science Education

Room Virtual Room

Richard E. Ladner, *University of Washington*; Andreas Stefik, *University of Nevada Las Vegas*; Amy J. Ko, Brianna Blaser, *University of Washington*; Stacy Branham, *University of California, Irvine*; Raja Kushalnagar, *Gallaudet University*

Designing a CS Master's Program for Post-Secondary Teaching

Room Virtual Room

Justin Hsia, *University of Washington*; Joshua Hug, *University of California, Berkeley*; Kendra Walther, *University of Southern California*

Capturing Lessons Learned from Pandemic Adaptations in CS Teaching: Exploring how COVID-19 has Affected the Future of Teaching and Learning in Computer Science

Room Virtual Room

Angela A. Siegel, *Dalhousie University*; Mark Zarb, *Robert Gordon University*

Disrupting Anti-Blackness While Making Room for Black Girls and Women in CS and Tech

Room Virtual Room

Nicol Howard, *University of Redlands*; Tia Madkins, *University Texas at Austin*; Shana V. White, *Kapor Center*

Rethinking the Bottleneck in Diversifying the Cybersecurity Talent Pool: What Actions can We Take and How can We Measure Success?

Room Virtual Room

Ahmed Ibrahim, Chelsea Gunn, Leona Mitchell, Sherif Khattab, *University of Pittsburgh*

Toward a Collaborative Open Source CS-focused Assessment Framework

Room Virtual Room

John R Hott, *University of Virginia*; Jeremiah Blanchard, *University of Florida*

Poster Sessions

Chairs:
S. Monisha Pulimood, *The College of New Jersey*
Ruth Anderson, *University of Washington*

Poster Session #1

Friday, March 4

10:00 am - 12:00 pm

Exhibit Hall C/D

An Exploration into School District Decision Making Around Elementary Computer Science Programs
Eleanor Richard, *University of Massachusetts Dartmouth*

Exploring Threshold Concepts for Intermediate Students
Brian M. McSkimming, Adrienne Decker, *University at Buffalo*

ITT: An Interactive Tutoring Tool to Improve the Learning and Visualization of Compiler Design Theory From Implementation
Rafael Del Vado Vírseda, *Universidad Complutense de Madrid*

Incorporating the Concepts of Fairness and Bias into an Undergraduate Computer Science Course to Promote Fair Automated Decision Systems
Sheikh Rabiul Islam, Ingrid Russell, *University of Hartford*; William Eberle, *Tennessee Tech University*; Darina Dicheva, *Winston-Salem State University*

Including Neurodiversity in Foundational and Applied Computational Thinking (INFACT)
Jodi Asbell-Clarke, Tara Robillard, Teon Edwards, Erin Bardar, *TERC*; David Weintrop, *University of Maryland*; Shuchi Grover, *Looking Glass Inc*; Maya Israel, *University of Florida*

Using Deep Learning to Localize Errors in Student Code Submissions
Shion Fujimori, Mohamed Harmanani, *University of Toronto*; Owais Siddiqui, Lisa Zhang, *University of Toronto Mississauga*

LupSeat: A Randomized Seating Chart Generator to Prevent Exam Cheating
Joël Porquet-Lupine, Hiroya Gojo, Philip Breault, *University of California, Davis*

Unplugged Parallelism for First-Year CS Majors
Barbara M. Anthony, *Southwestern University*; D. Cenk Erdil, *Sacred Heart University*; Robert Montante, *Bloomsburg University of Pennsylvania*; Olga Glebova, *Georgia State University*

The CCLA: Cultivating a Culture of Computing at a Small Liberal Arts University
Mark M. Meysenburg, *Doane University*

CLICK: A Mentoring Approach to Increasing Female Participation in Computer Science
Amanda O'Farrell, *TU Dublin*; Micheal Griffin, *Kishoge Community College*; Keith Nolan, *TU Dublin*

Design and Implementation of an Academic Integrity Module for Undergraduate CS Students
Debarati Basu, *Embry-Riddle Aeronautical University*; Harini Ramaprasad, *University of North Carolina at Charlotte*

Preferred Course Modality and Effective Teaching Methods for Graduate Level Courses
Dewan Tanvir Ahmed, *University of North Carolina at Charlotte*

Where's the Bug? Helping Students Find Errors in Physical Computing
Michael Schneider, *University of Colorado, Boulder*

Students of Color Organization Improves CS1 Grades
Allana Johnson, Gloria Childress Townsend, Khadija Stewart, *DePauw University*

Building K-12 Teacher Capacity to Expand Uptake in a National CS Curriculum
Keith Quille, Roisin Faherty, *TU Dublin*; Brett A. Becker, *UCD*

CryptoScratch: Teaching Cryptography with Block-based Coding
Nathan Percival, Pranathi Rayavaram, Sashank Narain, Claire Seungeun Lee, *University of Massachusetts Lowell*

Exploration of the Week-by-Week ICAP Transitions by Students
Adam M Gaweda, Collin F Lynch, *North Carolina State University*

Developing Inclusive Computing with the CT Pathways Toolkit
Merijke Coenraad, Quinn Burke, Pati Ruiz, Kelly Mills, Jeremy Roschelle, *Digital Promise*

Cybersecurity Shuffle: Using Card Magic to Introduce Cybersecurity Concepts
Preston Moore, Justin Cappos, *New York University*

Programming Practice Logs as a Tool to Support Equity and Inclusion
Sonya Cates, *Roger Williams University*

Transfer Support and Student Outcomes Correlations among URM and Non-URM Computing and Engineering Students
Danyelle Ireland, *University of Maryland, Baltimore County*; Amanda Menier, Rebecca Zarch, Jordan Esiason, *SageFox Consulting Group*

Exploring the Relationship Between Undergraduate Near-Peer Intersectional Computing, Mentoring, and Instructor Identities
Kristina Kramarczuk, Maya Narayanasamy, Anaum Khan, Jandelyn Plane, Kate Atchison, *University of Maryland*

Reflections on Educational Choices Made by Coding Bootcamp and Computer Science Graduates
Sherry Seibel, Nanette Veilleux, Tabitha Miles, Rachel Beaulieu, *Simmons University*

Building Community and Validating Co-Curricular Achievement
Paul Gestwicki, David L. Largent, *Ball State University*

Poster Sessions

Chairs:
S. Monisha Pulimood, *The College of New Jersey*
Ruth Anderson, *University of Washington*

Poster Session #2

Friday, March 4

3:00 pm - 5:00 pm

Exhibit Hall C/D

The Sol y Agua RPP: A Bilingual and Culturally Responsive Approach to Introduce Computational Thinking in Middle School
Monika Akbar, Katherine Mortimer, Grecia Navarrete, Stephanie Galvan, George Molina, Romelia Reyes, *The University of Texas at El Paso*; Cynthia Ontiveros, Scott Gray, Sarah Escandon, Monica Lyons, Pedro Delgado, Victor Medrano, Haleigh Kneedler, Patricia Benitez, Jacob Ramirez, Jesus Vazquez, Melissa Anderson, *El Paso Independent School District*

XDesign: Integrating Interface Design into Explainable AI Education
Hyungyu Shin, Nabila Sindi, Yoonjoo Lee, Jaeryoung Ka, *KAIST (Korea Advanced Institute of Science and Technology)*; Jeanyoung Y. Song, *DGIST (Daegu Gyeongbuk Institute of Science and Technology)*; Juho Kim, *KAIST (Korea Advanced Institute of Science and Technology)*

Introducing Programming to Middle School Students to Increase Knowledge and Interest in Computer Science
Callan J. Noak, Jennifer L. Tsan, Sujing Wang, Stefan Andrei, *Lamar University*

INSPIRE: Fourth Industrial Revolution Teaching in the Classroom
Oli Howson, Patricia Charlton, Francisco Iniesto, Wayne Holmes, *The Open University*

CS_{LINC} a Nationwide CS MOOC for Second-level Students
Karen Nolan, Keith Quille, *TU Dublin*; Brett A. Becker, *University College Dublin*

Climate Science, Data Science and Distributed Computing to Build Teen Students' Positive Perceptions of CS
Shuchi Grover, *Looking Glass Ventures*; Jessica Oster, Ákos Lédeczi, Brian Broll, Menton Deweesw, *Vanderbilt University*

Women's Longitudinal Career Trajectories Following Their Participation in a 3-Year Computing Camp
Maya Narayanasamy, *University of Maryland*

Pencil Puzzles as a Context for Introductory Computing Assignments in Diverse Settings
Zack Butler, Ivona Bezakova, Angelina Brilliantova, Hannah Miller, Kimberly Fluet, *University of Rochester*

Who is Failing CS1? Early Results from DFW Rate Investigation
Matthew Hertz, Carl Alphonce, Brian M. McSkimming, Adrienne Decker, *University at Buffalo*

Computer Science Education Policy: What California Can Tell Us about Contributing Factors to Success and Opportunities for Further Progress
Joel Knudson, Candice Handjojo, Ashley Sunde, *American Institutes for Research*

A Course on Data Quality in Analytics
Hongwei Zhu, *University of Massachusetts Lowell*

Developing and Implementing an Immersive Virtual Study Abroad Course on the History and Science of Information
James J. Butler, Shereen Khoja, *Pacific University*

Removing the Veil: Shining Light on the Lack of Inclusivity in Cybersecurity Education for Students with Disabilities
Felicia Hellems, Sajal Bhatia, *Sacred Heart University*

Teaching Parallel Programming with Java and Pyjama
Ruth Kurniawati, *Westfield State University*

Can CS1 Curricula Be Used For Middle School Computer Programming Education?
Gurmeher Kaur, *Chapel Hill High School*; Kris Jordan, Jasleen Kaur, *University of North Carolina at Chapel Hill*

Equity in Access to and Participation in K-12 Computer Science Education
Madeline L Haynes, Yiwen Yang, Natashia Bibriescas, Miriam Jacobson, Stephanie Baker, Jayce Warner, *Texas Advanced Computing Center*

How is Computational Thinking Defined in Elementary Science?
Jennifer Pietros, Sara Sweetman, Minsuk Shim, *University of Rhode Island*

Analyzing Student Experience of Time Trackers on Assessments
Ella Truslow, Nour Goulmamine, John R Hott, Nada Basit, *University of Virginia*

MOCSIDE: An Open-source and Scalable Online IDE and Auto-Grader for Computer Science Education
Jonathan Cazalas, Max Barlow, Ibraheem Cazalas, Chase Robinson, *Florida Southern College*

The Effect of Program Cost on Minority Student Virtual Computing Outreach Participation
Kaylah Mackroy, Whitney Nelson, Kinnis Gosha, *Morehouse College*

Measuring the Impact of COVID-19 on the Health and Wellbeing of Computer Science Practitioners
Tom Crick, Cathryn Knight, *Swansea University*; Richard Watermeyer, *University of Bristol*

Add Some Action to the Output: A Ready-to-Use, Customizable Asset for Easily Adding Animation to Python Programs
Madalene Spezialetti, Brian Garten, *Trinity College*

Instantiating Specifications Grading in Computer Science Courses
David L. Largent, *Ball State University*

Insights from Virtual Culturally Responsive Computing Camps
Jaemarie Solyst, *Carnegie Mellon University*; Tara Nkrumah, *Arizona State University*; Angela Stewart, *Carnegie Mellon University*; Amanda Buddemeyer, Erin Walker, *University of Pittsburgh*; Amy Ogan, *Carnegie Mellon University*

Poster Sessions

Chairs:
S. Monisha Pulimood, *The College of New Jersey*
Ruth Anderson, *University of Washington*

Poster Session #4 Virtual

Friday, March 4

3:00 pm - 500 pm

Exhibit Hall C/D

From the Game Ideas Prototypes to their Final Versions using International Intensive Project Results
Piotr Milczarski, Norbert Borowski, Artur Hłobaş Michał Beczkowski, *University of Lodz*

Teacher Self-efficacy During Professional Development for Game Design and Unity
Charles B. Hodges, Mete Akcaoglu, Andrew Allen, Selçuk Doşan, *Georgia Southern University*

Diversifying the Face of Computing through Re-entry Initiatives for Returning Women
Farzana Rahman, *Syracuse University*; Elodie Billionniere, *Miami Dade University*; Vaishnavi Prashant Subhedar, *Syracuse University*

First Impressions of Using Stack Overflow for Education in a Computer Science Bachelor Programme
Stefan Hugtenburg, Andy Zaidman, *Delft University of Technology*

How Do You Know if They Don't Know? The Design of Pre-Tests in Computing Education Research
Miranda C. Parker, *University of California, Irvine*; Yvonne S. Kao, *WestEd*

Do students Git it? A Lightweight Intervention to Increase Usage of Advanced Git Features
Todd Sproull, *Washington University in St. Louis*

Equity-focused Peer Mentoring for High School CS Teachers
Aleata Hubbard Cheuoua, *WestEd*; Bryan Twarek, Ed Campos, *CSTA*; Amy Fetherston, *CSTA Wisconsin Dairyland*; Yvonne Kao, *WestEd*; Linnea Logan, *CSTA Wisconsin Dairyland*

Feedback on Program Development Process for CS1 Students
Charis Charitsis, Chris Piech, John C. Mitchell, *Stanford University*

Are We There Yet? Novices' Code Smells linked to Loop Constructs
Cruz Izu, Shrey Chandra, *The University of Adelaide*

Inclusive Thinking Questionnaire: Preliminary Results
Dhruv Nagpal, Jaskaran Singh Bhatia, Dev Goel, Parthasarathy P D, Snigdha Tiwari, Swaroop Joshi, *BITS Pilani*

Authentic Learning of Machine Learning in Cybersecurity with Portable Hands-on Labware
Dan Chia-Tien Lo, Hossain Shahriar, Kai Qian, Michael Whitman, *Kennesaw State University*; Fan Wu, Cassandra Thomas, *Tuskegee University*

It is what the situation demands": How Communities of Practice Create Value for CS Teachers in the Time of Covid"
M. Livingston, Lijun Ni, Yan Tian, *University at Albany, SUNY*; Jason Bohrer, Jake Baskin, *CSTA*

A Novel Machine Learning and Artificial Intelligence Course for Secondary School Students
Joyce Mahon, *University College Dublin*; Keith Quille, *Technological University of Dublin;* Brian Mac Namee, Brett A. Becker, *University College Dublin*

Increasing Computing Participation through School Counselors
Wendy Chi, *National Center for Women & Information Technology*; Patricia Morreale, Jean Chu, *Kean University*; Angela Cleveland, Maureen Stewart, *National Center for Women & Information Technology*

Enhance Capacity to Foster Secondary Computer Science Teachers in Multiple Pathways
Dan Chia-Tien Lo, Brian Lawler, *Kennesaw State University*

A Tool to Teach Expressions with Feedback About Broken Laws
Oleg Sychev, Nikita Penskoy, Grigory Terekhov, *Volgograd State Technical University*

TinyMLedu: The Tiny Machine Learning Open Education Initiative
Brian Plancher, Vijay Janapa Reddi, *Harvard John A. Paulson School of Engineering and Applied Sciences*

Evaluating Short Animation Videos in Asynchronous Teaching
Chen Liang, *University of Michigan*; Bobak Mortazavi, *Texas A&M University*

Testing Machine Learning Models to Identify Computer Science Students at High-risk of Probation
Hamza Errahmouni Barkam, *University of California, Irvine*; Max Wang, *Cal Poly Pomona*; Barbara Martinez Neda, Sergio Gago Masague, *University of California, Irvine*

Poster Sessions

Chairs:
S. Monisha Pulimood, *The College of New Jersey*
Ruth Anderson, *University of Washington*

Poster Session #3

Saturday, March 4

10:35 am - 12:30 pm

Exhibit Hall C/D

Computational Thinking Integration Design Principles in Humanities
Secil Caskurlu, Anne Drew Hu, Aman Yadav, *Michigan State University*; Rafi Santo, *Telos Learning*

Designing Equity-Centered Formative Assessment Artifacts for Computing
Pati Ruiz, *Digital Promise*; Emily Nestor, *Talladega County Schools*; Kelly Mills, Merijke Coenraad, Quinn Burke, *Digital Promise*

ExCITE: Broadening Participation with Service Learning
Lily R. Liang, Briana Wellman, Uzma Amir, *University of the District of Columbia*

Beyond MCQ: Designing Innovative, Engaging, Autogradable Assessments for Supporting Teaching & Learning in K-12 Computer Science
Shuchi Grover, Bob Carmichael, Shivram Venkatasubramaniam, *Looking Glass Ventures*

Investigating the Impact of Voice Response Options in Surveys
Pan Chen, *University of Toronto*; Naaz Sibia, *University of Toronto Mississauga*; Angela Zavaleta Bernuy, *University of Toronto*; Michael Liut, *University of Toronto Mississauga*; Joseph Jay Williams, *University of Toronto*

Training Near-Peer Mentors for Instructional Roles in Informal K-12 Computing Programs
Kristina Kramarczuk, Maya Narayanasamy, Kate Atchison, Jandelyn Plane, *University of Maryland, College Park*

Predicting Success in CS1 - An Open Access Data Project
Keith Quille, Keith Nolan, *TU Dublin*

Reflections of Cybersecurity Workshop for K-12 Teachers and High School Students
Chad Mourning, David Juedes, Allyson Hallman-Thrasher, Harsha Chenji, Savas Kaya, Avinash Karanth, *Ohio University*

A Case Study on The Adoption of Open Educational Resources in a C Programming Course
Julio César Bahamón, *University of North Carolina at Charlotte*

Women More Likely to Have a Sense of Belonging in Coding Bootcamps than University Computer Science Programs
Sherry Seibel, Nanette Veilleux, Tabitha Miles, Rachel Beaulieu, *Simmons University*

How Do Students Seek Help and How Do TAs Respond? Investigating Help-Seeking Strategies in CS1 Office Hours
Harrison Kwik, Haoqi Zhang, Eleanor O'Rourke, *Northwestern University*

Bringing Ethics and Justice into CS1 Courses through Data that Shows an Incomplete Picture
Yunhao Wang, Johanna Okerlund H. V. Jagadish, *University of Michigan)*

Universal Design of Interactive Mathematical Notebooks on Programming
Bin Guo, Jason Nagy, Emil Sekerinski, *McMaster University*

Curricula Design in Public Interest Tech Using OER
Susan P. Imberman, *College of Staten Island CUNY*

Validation of the Programming Emotions Questionnaire
Sarthak Awasthi, Rakhi Batra, Syedah Zahra Atiq, *The Ohio State University*

Students' Engagement in Collaborative Active Learning - Online v.s. Face-to-Face
Karen Jin, *University of New Hampshire*

Co-Designing Learning Experiences to Support the Development of Culturally Relevant CS Lessons in Elementary Classrooms
Jennie Chiu, *University of Virginia*; Anita Crowder, *CodeVA*; Dwayne Ray Cormier, *Virginia Commonwealth University*; Sheila Mosby, *Petersburg School District*; Eric Bredder, *University of Virginia*

Reading Between the Lines: Student Experiences of Resubmission in an Introductory CS Course
Leah Perlmutter, Jayne Everson, Ken Yasuhara, Brett Wortzman, Kevin Lin, *University of Washingto)*

Exam Time: How Students Spend Their Time When Taking Exams
Brian P. Railing, *Carnegie Mellon University*

Reversing Our Ways from x86 VM Configurations onto ARM-Based Raspberry Pis
Hsiao-An Wang, Dennis Brylow, Debbie Perouli, *Marquette University*

High-level to Low-level in Unity with GPU Shader Programming
Dimitrij (Mitja) Hmeljak, *Indiana University*

Metrics for Student Classroom Engagement and Correlation to Software Assignment Plagiarism
William Allen, Shelly Belsky, Ben Kelly, Jenay Barela, *Rensselaer Polytechnic Institute*; Matthew Peveler, *PopSQL, Inc.*; Barbara Cutler, *Rensselaer Polytechnic Institute*

An Introduction to Computer Science in the New Curriculum for Wales
Tom Crick, *Swansea University*

Poster Sessions

Chairs:
S. Monisha Pulimood, *The College of New Jersey*
Ruth Anderson, *University of Washington*

Poster Session #3 Virtual

Saturday, March 4

10:35 am - 12:30 pm

Exhibit Hall C/D

Developing an Ecosystem of Support for K-12 CS Educators
Bryan Twarek (Computer Science Teachers Association); Janice Mak, *Arizona State University*; Shaina Glass, *Computer Science Teachers Association*; Sababu Chaka Barashango, *Georgia Institute of Technology*; Cindi Chang, *Nevada Department of Education*

Enabling In-Class Peer Feedback on Introductory Computer Science Coding Exercises
Alina Zaman, Vinhthuy Phan, Amy Cook, *University of Memphis*

Don't Just Paste Your Stacktrace: Shaping Discussion Forums in Introductory CS Courses
Amogh Mannekote, Mehmet Celepkolu, Aisha Chung Galdo, Kristy Elizabeth Boyer, Maya Israe, *University of Florida*; Sarah Heckman, *North Carolina State University*; Kristin Stephens-Martinez, *Duke University*

Improved Testing of PrairieLearn Question Generators
Aayush Shah, Alan Lee, *UC Berkeley*; Chris Chi, *Harvard University*; Ruiwei Xiao, *University of Washington at St. Louis*; Pranav Sukumar, Jesus Villalobos, Dan Garcia, *UC Berkeley*

Supporting Teacher Professional Learning and Curriculum Implementation Through Collaborative Curriculum Design
Lijun Ni, Gillian Bausch, *University at Albany, State University of New York*; Bernardo Feliciano, Hsien-Yuan Hsu, Fred Martin, *University of Massachusetts Lowell*

Using WebAssembly to Teach Code Generation in a Compiler Design Course
Ariel Ortiz, *Tecnologico de Monterrey*

Seamless Embedding of Programming IDEs into Computer-Based Testing Software
Abel Yagubyan, Dan Garcia, University of California, Berkeley

A Preliminary Study of Peer Assessment Feedback within Team Software Development Projects
Tom Crick, Swansea University; Tom Prickett, Jill Bradnum, *Northumbria University*

Grading Mastery: Calculating Grades from Domain-Law Violations
Oleg Sychev, Yaroslav Kamennov, *Volgograd State Technical University*

Lightning Talks

Chairs:
Lina Battestilli, *North Carolina State University*
Jennifer Campbell, *University of Toronto*

Some Lightning Talks are being presnted VIRTUALLY. See page 00 for listing.

Lightning Talks Session #1

Thursday, March 3
3:45 pm - 5:00 pm

Room 554 A/B

Are Executable Exams Executable?
Yael Erez, *Technion - Israel Institute of Technology & Ort Braude College of Engineering*; Orit Hazzan, *Technion - Israel Institute of Technology*

Exploring Threshold Concepts for Intermediate Students
Brian M. McSkimming, Adrienne Decker, *University at Buffalo*

CoTinker - A Toolkit for Supporting Computational Thinking and Collaboration in High School Education
Line Have Musaeus, Marianne Graves Petersen, Clemens Nylandsted Klokmose, Ole Sejer Iversen, *Aarhus University*

Computing Verbs to Enhance Bloom's Revised Taxonomy
Cara Tang, *Portland Community College*; Markus Geissler, *Cosumnes River College*; Christian Servin, *El Paso Community College*; Cindy Tucker, *Bluegrass Community and Technical College*

CSAwesome Java Curriculum
Barbara Ericson, *University of Michigan*; Beryl Hoffman, *Elms College*

Attitudes Matter! (So Do Instruments To Measure Them!)
April Kerby-Helm, *Winona State University*; Michael A. Posner, *Villanova University*

Teaspoon Languages for Integrating Programming into Social Studies, Language Arts, and Mathematics Secondary Courses
Mark Guzdial, *University of Michigan*

Computer Science Teacher Preparation to Address Bloom's 2 Sigma Problem in the Post-COVID19 Age
Rinat B. Rosenberg-Kima, *Technion - Israel Institute of Technology*

Establishing a Connection between Programming and Proof Writing
Steve Earth, *Drexel University*

Lightning Talks Session #2

Saturday, March 5
9:45 am - 10:35 am

Room 554 A/B

Wayfinding for an Educational Game Approach to Algorithmic Interrogation and Analysis
Michael Smith, *Northwestern University*

Educating Students to be Better Citizens of Tech Communities
Vandana Singh, *University of Tennessee*; Jeffrey Carver, *University of Alabama*

Learning about Complex Adaptive Systems in Makerspaces
Michael Johnson, Betsy Disalvo, *Georgia Institute of Technology*

What Programming IDEs Can Learn From MineCraft
Yuan Garcia, *Mills High School*

Lightning Talks Session #2 Virtual

Saturday, March 5
9:45 am - 10:35 am

Room 554 A/B

Girls Immersed in Robotics Learning
Beryl Hoffman, *Elms College*; Florence Sullivan, *University of Massachusetts, Amherst*; Daniel Black, Jacob Bashista, *Holyoke Codes*; Rachel Darley Gary, *Moriarty Research and Evaluation Associates, LLC*; Isabel Castellanos, *University of Massachusetts, Amherst*; Mary Moriarty, *Moriarty Research and Evaluation Associates, LLC*; Elisabeth Fein, *Holyoke Codes*; Özkan Yildiz, Ali Söken, *University of Massachusetts, Amherst*; Andrew Pasquale, *Holyoke Codes*

The Benefits of HTML Slides for Programming Lectures
Pamela Fox, *University of California, Berkeley*

Examples of Culturally Responsive Teaching in Computational Thinking Curriculum
Dana Saito-Stehberger, *UC Irvine*

ACM Student Research Competition

2022 ACM Student Research Competition

Chairs:
TBD
TBD

The ACM Student Research Competition (SRC) at SIGCSE awards prizes to the top three graduate and undergraduate students determined by faculty judges. Initially, students use the interactive nature of visual presentation to highlight different aspects of their research to individual evaluators. These presentations are evaluated on their quality, the significance of the works, and the clarity of the informal discussion. The semi-finalists present their contributions using the standard forum of conference presentation during two conference sessions. The venue provides selected audience attendees with another platform for evaluation, the student with the experience in formal presentations, and conference participants with the opportunity to learn of ongoing, current research in computer science.

The winners will be announced and receive their awards during Saturday's Closing Keynote Session.

Some Student Research Competition papers are being presnted VIRTUALLY. See page 00 for liting.

GRADUATE

Posters:
Friday, March 4 • 3:45 pm - 5:00 pm

Room Providence Ballroom I/IV

The Development of Computational Thinking in Computing Higher Education
Carolina Moreira Oliveira, *Federal University of Paraná*

Finding the Most Relevant Pages of the Learning Materials on which a Student Just Focuses
Taichi Imbe, *Meisei University*

What Does Literature Tell Us About Recursion?
Sean Mackay, *University at Buffalo*

Equipping Middle School Teachers with Culturally Responsive Pedagogy for Computer Science Through Community-centered Professional Development
Gillian Bausch, *University at Albany, SUNY*

Cross-grade Comparison of Computational Thinking in Young Children Using Normalized Unplugged Assessment Scores
Emily Relkin, *Tufts University*

GRADUATE VIRTUAL

Supporting Novice Learners' Coding through Productive Failure-Based Debugging Activities
Sagun Giri, *The Pennsylvania State University*

UNDERGRADUATE

Posters:
Friday, March 4 • 3:45 pm - 5:00 pm

Room Providence Ballroom I/IV

K-12 CS Teacher Licensing in the US
Jessica M Yauney, *Brigham Young University*

Constructivism in Computer Science Education
Julie Smith, *University of North Texas*

Rho-NLR: A Neural Lumigraph Renderer with Controllable Illumination
Laura Perkins, *New College of Florida*

The Effect of Animation and Real-world Analogies on Learning Computer Systems Concepts by Diverse Students
Zhen Wu, Rachel Puckett, Wonsun Ahn, Sherif Khattab, Luis Oliveira, Vinicius Petrucci, *University of Pittsburgh*

Misconceptions about Computer Science Leads to Deferred Entrance to the Technology Field
Tabitha Miles, *Simmons University*

Interactive Network Visualization of Learning Progressions
Nathan Hurtig, *Rose-Hulman Institute of Technology*

Celer: A Smart Fleet Management System (Optimizing Traffic Flow in New York City)
Ugo Dos Reis, Maheen Ferdousi, Ilir Dema, *University of Toronto*

Using LSTM Networks for Multiparameter Physiological Signal Reconstruction to Reduce Training Time
Alia E. Alramahi, Adrian K. Cornely, Grace M. Mirsky, *Benedictine University*

UNDERGRADUATE VIRTUAL

Mining Data on Computing Majors Knowledge Game
Sam Thach, Cecily Heiner, *Oregon Institute of Technology*

Exhibit Hall Floor Plan

Exhibitor Listing by Booth Number

SIGCSE 2022 Guide to Exhibitors

SILVER SUPPORTER

ABET

Booth 000

415 N Charles St
Baltimore, MD 21201

Description to come.

ACM-W/CCECC

Booth 000

1601 Broadway
New York, NY 10019

Description to come.

Auburn University

Booth 000

3101 Shelby Center
Auburn, AL 36849

Description to come.

CodeDay

Booth 000

340 S Lemon Ave
PMB 7763
Walnut, CA 91789

Description to come.

SILVER SUPPORTER

CodeGrade

Booth 211

Weteringschans 124
Amsterdam, 1017 XT
Netherlands
codegrade.com

CodeGrade offers the flexible learning platform for coding education. CodeGrade offers the most powerful autograding system, plagiarism detection, powerful manual feedback features and an online editor. With CodeGrade we are empowering coding teachers to design tailored educational experiences. Both with our platform, but also with our cooperation and consultancy. We do this because we want accessible coding education for everyone. Learn more at www.codegrade.com or visit booth #211.

GOLD SUPPORTER

CODIO

Booth 203

CIC 12th Floor
245 Main Street
Cambridge, MA 02142

Description to come.

Consortium for Computing Sciences in Colleges (CCSC)

Booth 000

Landmark College
19 River Road
Putney, VT 05346

Description to come.

SIGCSE 2022 Guide to Exhibitors

Cubits

Booth 000

PO Box 118
Ringoes, NJ 08551

Description to come.

PLATINUM SUPPORTER

GitHub Education

Booth 103

88 Colin P. Kelly Jr. St
San Francisco, CA 94107

Description to come.

PLATINUM SUPPORTER

GOOGLE

1600 Amphitheatre Parkway
Mountain View, CA 94043
edu.google.com/computer-science/advanced

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Gradescope by Turnitin

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Jones & Bartlett Learning

Booth 000

25 Mall Road
Burlington, MA 01803

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Mercury Learning & Information

Booth 000

PO Box 194
Duxbury, MA 02331

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PLATINUM SUPPORTER

Microsoft

Booth 102

One Microsoft Way
Redmond, WA 98052

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MIT Press

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Cambridge MA 02142

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Booth 000

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NSF

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Alexandria, VA 22314

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SILVER SUPPORTER

Pearson

Booth 210

221 River St
Hoboken, NJ 07030

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GOLD SUPPORTER

Rephactor

Booth 214

2455 South Road
Poughveepsie, NY 12601
www.research.ibm.com/university/

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SILVER SUPPORTER

Replit

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San Francisco, CA 94107

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Sense Education

Booth 000

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New York, NY 10024

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SIGCSE 2023

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New York, NY 10018
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Springer Nature

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New York, NY 10004

G.

Virginia Tech

Booth 000

2202 Kraft Drive
Blacksburg, VA 24060

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GOLD SUPPORTER

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