



## **32<sup>nd</sup> Annual CCSC Rocky Mountain Conference Program Metropolitan State University of Denver**

**Friday, October 20, 2023  
11:00 am - 12:00 pm  
Location: AES-Forum (1st Floor)  
Keynote Speech  
Dr. Weiying Zhu**

### **Converting Upper-Division Undergraduate Computer Science Courses Online: Challenges, Student Performance, and Student Perceptions**

#### **Abstract:**

While considering offering online Computer Science (CS) courses at non-online programs in response to student demand or program need, how to address the challenges in online teaching and whether the student performance in an online course is compromised are two critical questions. In the literature, we could not find clear answers to these questions, especially for CS courses studied in this research in settings like ours. Converting three upper-division CS courses online in 2020-21 provided us an opportunity to explore the instructional design for online courses, to identify the challenges in online teaching, and to develop the strategies addressing challenges. We use t-tests to compare the student performances in online vs. face-to-face (F2F) sections of each course because our sample sizes fit in the most appropriate range (20 to 40) of t-tests. Box-and-whisker plots are also used to graphically compare student performances. Anonymous student surveys consisting of Likert-scale questions are used to investigate student perceptions in online courses. The analysis of performance and survey data shows no statistically significant performance difference between the online and F2F sections of each course taught by the same instructor as well as generally positive or very positive student feedback on teaching and learning in three online CS courses. Focusing on three neutral research questions, our study does not aim to comprehensively compare online and F2F modes or find which mode is better. We hope that our experience and findings may provide useful and evidence-based information to other non-online computing or engineering programs, especially the ones like ours, when they need to consider whether to offer online courses.



# **32<sup>nd</sup> Annual CCSC**

## **Rocky Mountain Conference Program**

### **Metropolitan State University of Denver**

Friday, October 20, 2023  
*Paper Sessions*  
Location: AES-220 (2nd Floor)

**12:00 pm - 12:25 pm**

*The Generation of a Large Bank of Randomized Questions in a Discrete Structures Course*

Jose Cordova, University of Louisiana at Monroe

**12:30 pm - 12:55 pm**

*ML Production Systems Course at a Polytechnic PUI*

Ronald James Nowling, Milwaukee School of Engineering

**1:00 pm - 1:25 pm**

*Digital Circuit Projects for an Accelerated Online Undergraduate Computer Architecture Course*

Bin Peng & John Cigas, Park University

**1:30 pm - 1:55 pm**

*Break, Poster Session, & ACM2Y Dr. Tang*

**2:00 pm - 2:25 pm**

*Experiences introducing the POGIL methodology for teaching Computer Architecture*

Pamela Smallwood, Regis University

**2:30 pm - 2:55 pm**

*Teaching and Learning with Virtual Reality*

Daniel Cliburn, University of the Pacific

**3:00 pm - 3:25 pm**

*A Stakeholder Visualization Tool Study*

Johanna Blumenthal & Richard Blumenthal, Regis University

**3:30 pm - 3:55 pm**

*Break, Poster Session, & ACM2Y Dr. Tang*

**4:00 pm - 4:25 pm**

*Like a Bee to a Honeypot: A Bug Bounty Capstone Project*

Steven Fulton, Matthew Dickerman, Madison Gillan, Krittawata Su-uthai,  
Krittawata, Alison Thompson, & Peter Ye, US Air Force Academy

**4:30 pm - 4:55 pm**

*The Structure of a Graduate Defensive Cybersecurity Course*

Mohamed Lotfy, Utah Valley University

**5:00 pm - 5:25 pm**

*Is the Amount of Computer Game Play Since High School Associated with Mental Health Outcomes in Adulthood?*

Max Marc, Black Hills State University

**5:30 pm - 6:00 pm**

**CCSCRM Board Meeting (open to all)**

**6:00 pm - 8:00 pm**

**Banquet - AES Lounge (1st Floor)**

Note:

All times are Mountain Time



# **32<sup>nd</sup> Annual CCSC**

## **Rocky Mountain Conference Program**

### **Metropolitan State University of Denver**

Friday, October 20, 2023  
*Tutorial Sessions*  
Location: AES-250 (2nd Floor)

**12:00 pm - 1:30 am Tutorial I - Room**

*Developing Identity-Focused Program-Level Learning Outcomes for Liberal Arts Computing Programs*

Jakob Barnard, Grant Braught, Janet Davis, Amanda Holland-Minkley, David Reed, Karl Schmitt, Andrea Tartaro, & James Teresco, Siena College

**2:00 pm - 3:30 pm Tutorial II - Room**

*Teaching Global and Ethical Perspectives in Information Technology*

Cynthia Krebs, Jan Bentley, & DeDe Smith, Utah Valley University

**4:00 pm - 5:30 pm Tutorial III - Room**

*Incorporating Computing for the Social Good into the Classroom*

Richard Blumenthal & Johanna Blumenthal, Regis University

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# **32<sup>nd</sup> Annual CCSC**

## **Rocky Mountain Conference Program**

### **Metropolitan State University of Denver**

Saturday, October 21, 2023  
*Tutorial Sessions*  
Location: AES-250 (2nd Floor)

**9:00 am - 11:00 am Tutorial IV - Room**

*Getting Started on Jetstream2*

*Daniel Havert & Zachary Graber, Indiana University*

**11:00 am - 12:30 pm Tutorial V - Room**

*How to Install and Use a Security Onion NIDS VM in a Defensive Cybersecurity Course*

*Mohamed Lotfy, Utah Valley University*

**12:30 pm - 1:00 pm - Room**

**Lunch**

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