

2022 CAE in Cybersecurity Community Symposium

June 8-10, 2022

The Westin Peachtree Plaza

Atlanta, GA

Welcome

Welcome to the 2022 CAE Community Symposium. It's great to be together again live after so much time isolated from each other. Zoom has been invaluable, but nothing is as great as meeting in person.

You all persevered through the challenges of the last two years, and as much as we'd all like to think that's behind us, we're not quite there yet. I'm confident whatever we face in the future, if we work together as we have through this last challenge, we'll all succeed.

So many exciting things are going on across the nation in cybersecurity education and workforce development. In Washington, the federal government is working hard to find resources and collaborate on solutions to the problems facing the nation in cybersecurity and education. You've all participated in several events and initiatives, and we look forward to your continuing support.



You're also all busy in your own communities. As I've had the chance in recent months to travel and meet with several of you, I have been proud and overwhelmed by the great work you are all doing. Your creativity and innovation are taking us into new territory, new ideas, and exciting ways of addressing the challenges, vulnerabilities and risks to our nation. I look forward to continuing our work together as we move into this new post-COVID environment with new tools and new ideas for the future.

Lynne Clark is the Acting Chief of the Center for Education Outreach and Innovation at the National Cryptologic School (A29), NSA. She has 43 years of combined military and civilian service. She received her Air Force commission in 1978, and joined NSA in 1999.

The Center for Education Outreach and Innovation managers the National Cryptologic School's academic activities outside of NSA. This includes the CAE-C program, the GenCyber and STARTALK summer camp programs, cyber competition and Military Academy internship programs, and visiting professors at universities across the nation.

Ms Clark and her team manage CAE-C program office functions such as establishing and maintaining designation criteria, collecting and adjudicating designation applications, bringing new schools into the program, and, on behalf of DoD-CIO, managing the DoD Cyber Scholarship program. Ms Clark facilitates partnerships with federal departments and agencies and represents the National Security Agency at meetings and events. Prior to this assignment, Ms Clark was Deputy Chief of Workforce Resources, Education and Development for NSA's Information Assurance Directorate (IAD). This included responsibility for IAD's hiring and intern programs.

She is the recipient of the Meritorious Civilian Service Award, awarded the Joint Meritorious Unit Award twice for IOSS special projects in support of the Department of Defense, and the National Intelligence Meritorious Unit Citation for support to the Intelligence Community.

Prior to her tenure at the IOSS, Ms Clark served in the U.S. Air Force with worldwide assignments in airspace management, radar operations and operations risk management. She spent eight years serving in NATO during the Cold War and during the Germany reunification. She was involved in development of secure range operations for military RDT&E facilities, advised on risk management issues involved in the START and Open Skies treaties, and managed the Air Force OPSEC Program at the Pentagon. She retired at the rank of Lieutenant Colonel in 1999.

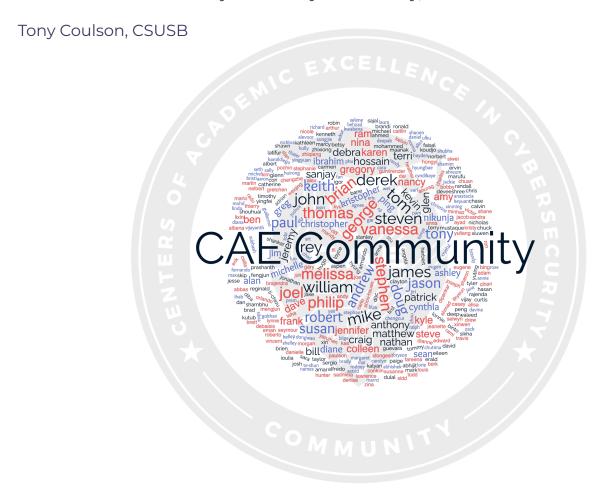
Ms. Clark's academic credentials include a Masters in Clinical Psychology from the Fielding Institute, and a B.A. in Community Development from Baldwin-Wallace College.

Message from the Community

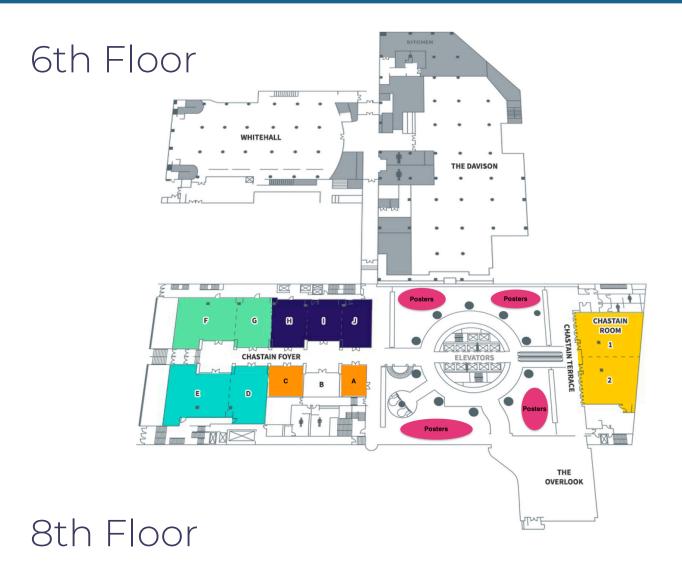
Cybersecurity educators are facing demands from government and industry to produce more graduates to fill the current and future workforce needs. Each year, the Centers of Academic Excellence in Cybersecurity Community (CAE-C) assembles to discuss the workforce problem as well as to discuss issues unique to our community, including faculty shortages, bridging the skills gap, and career pathways. The CAE Community is a critical resource in developing a capable cybersecurity workforce for both industry and government. As we like to say, "When have we ever had 380+ colleges and universities working together to solve a problem like this?"

Thank you for your efforts in developing and nurturing the future cyber workforce. There is still much work to be done but the fruit of your efforts will be felt for generations to come.

On behalf of the CAE in Cybersecurity Community,



Getting Around



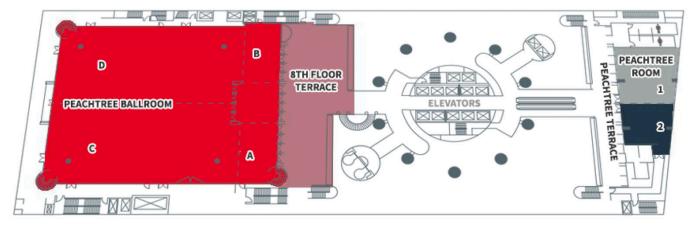


Table of Contents

Welcome	2
Getting Around	4
All-Hub Mixer	6
Social Mixer	8
Conference Agenda	10
CAE-R Track Agenda	12
CAE-CD Track Agenda	14
CAE-CO Track Agenda	18

We want your feedback!

Fill out the symposium survey now!









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All-Hub Mixer

Mark it on your schedule!



CADEMIC EXCELLENCE 11

COMMUNITY





Come meet with other regional PIs! Refreshments provided.



All-Hub Mixer Agen<mark>da</mark>

Come Join us for

Pre check-in, Hub map activity hosted by CAE-C Community National Center, and Hub Members Networking Session with refreshments.

Northeast

Stop by and meet your NE reps! Get more info on the Regional Faculty Advisory Board and provide input on who you want to see at the next NE regional townhall meeting. You're invited to learn more about how to get students in NUARI exercises and the NCAE Cyber Games.

Northwest

Find out what's happening in the NW community! From Outreach events to Faculty Development grants, the NW has tons of initiatives to get involved in. Come hear about their work in GenCyber camps, competency working group meetings, and with the State Department of Education. Looking for regular updates? Sign up for the Bits and Bytes newsletter full of CAE Community opportunities.

Midwest

Enjoy a quick meet and greet with other Midwest Hub PIs and share CAE cybers ecurity initiatives occurring at your institution. Get to know your leads Dr. John Sands and Stanley Kotska with appearances from Davenport University and Lonnie Decker. They will be discussing efforts up to date including K-12 Cybersecurity Career Pathways and Educational RING Initiatives. You can also get more info on how to sign up for the August Midwest PI In-person meeting at Moraine Valley Community College on August 18 as well as the August 19 CAE Designation Ceremony.

Southwest

Come talk to the SW Hub and get more info on their two day in-person NCAE-C Southwest Regional Hub Event on June 21 & 22 in San Antonio Texas at University of Texas San Antonio and San Antonio College Campuses. They'll be discussing how to get involved with Quarterly Virtual Southwest Region Meetings, NUARI Competitions Program, and CAE-C Competitions. Be sure to ask about their involvement with Whatcom Community College and the NCyTE center to review CAE applications

Southeast

Please join the SE Hub for the 2022 Southeast CAE-C Forum and Designation Ceremony on Sep. 28-29, in Charlotte, NC. The SE event will include updates from the NCAE-C Program Office and Community Center, shareable best practices and resources, and networking and collaboration opportunities with the CAE-C Community, government, and industry partners.



Join us after the breakout sessions on Thursday for a resource expo and mixer with our industry sponsors.

June 9 | 5-9pm

Hors d'ouervres and refreshments provided

Chastain level - 6th Floor







Schedule of Events

5:00-9:00pm Hors d'ouervres and

refreshments

Chastain Foyer

5pm-9pm CARD/CLARK

Chastain Foyer

5:30pm Presentation by Immersive Labs

Chastain DE

6:00pm Presentation by Cyberbit

Chastain HIJ

6:30pm Presentation by Haiku

Chastain FG





Hosted by:



Thursday, June 9, 2022

7:30am	Registration (No breakfast provided) (8th floor Ballroom)
8:00am	Welcome (8th floor Ballroom)
8:15am	CAE-C Community Updates (8th floor Ballroom)
8:45am	NCAE-C Partner Updates (8th floor Ballroom)
9:45am	Break
10:00am	Competitions (8th floor Ballroom) Jake Mihevc
10:30am	CARD and CLARK (8th floor Ballroom) Sidd Kaza and Blair Taylor
10:55am	KU Initiatives (8th floor Ballroom)
11:10am	CAE-R Designation Presentation (8th floor Ballroom)
12:00pm	Working lunch – box lunch grab and go to:
	CAE-CD Track 12:00pm: Fast Pitch Talks 1:10pm: Break 1:20pm: Presentations 2:45pm: Break 3:00pm: Presentations 1:10pm: Presentations 2:45pm: Break 3:00pm: Presentations 1:10pm: Break 3:00pm: CO POC Meeting with KUs 2:45pm: Break 3:00pm: CO Designation Criteria (open to all with a Q&A) 1:00pm: CAE-R Track 12:00pm: CAE-R Designation Q&A 1:00pm: Research Grant Presentations 2:45pm: Break 3:00pm: CAE-R POC Meeting
4:45pm	Break
5:00pm-9:00pm	Sponsor Mixer (6th Floor) - Hors D'oeuvres and poster presentations (please note, posters will be unattended)

Friday, June 10, 2022

8:00am	NCAE-PMO and NICE Updates (8 Working Breakfast	3th floor Ballroom)
8:30am	CAE Community service recogni	tions (8th floor Ballroom)
9:00am	Keynote (8th floor Ballroom)	
9:45am	Keynote Q&A (8th floor Ballroom	n)
10:00am	Morning Break	
10:15am	CAE-CD Track 10:15am: CAE Panel Presentation 11:00am: New CAEs and New POCs Meet-and-Greet with welcome by Lynne Clark (Ballroom)	CAE-R Track 10:15am: TD Panel 11:15am: INSuRE+C Student Project Presentation
12:15pm	Dismissal/Closing Remarks (Lune Tony Coulson	ch not provided)



CAE-R Schedule

	Thursday, June 9, 2022
11:00am	Presentation CAE-R (Re-)Designation (8th Floor Ballroom) Session Chairs: Cynthia Irvine and Susanne Wetzel
12:00pm	Q&A on CAE-R (Re-)Designation Session Chair: Agnes Chan
1:00pm	Research Grantee Presentations (6th floor, Chastain 1 and 2) Session Chair: Eugene Vasserman 1:00pm: Overview of CAE Research Program, Alice Smitley, NSA 1:20pm: Path-Aware Risk Scores for Access Control in Zero-Trust Systems, Philip Brown, University of Colorado, Colorado Springs 1:40pm: Juicing V8: A Primary Account for the Memory Forensics of the V8 JavaScript Engine, Ibrahim Baggili, Samuel Bergami, and Enoch Wang, Connecticut Institute of Technology 2:00pm: Exploration of Heuristic and Probabilistic Tools in Quantum Computing with Applications to Cryptography, Hugo Delgado, Polytechnic University of Puerto Rico 2:20pm: CanarySat: A Virtual CubeSat Model for Cybersecurity Research and Education, David Coe, Aleksandar Milenkovic, Jeffrey Kulick and
2:40pm	Letha Etzkorn, The University of Alabama in Huntsville Break
3:00pm-5:00pm	CAE-R Point of Contact Meeting (6th floor, Chastain 1 and 2) Session Chairs: Agnes Chan and Susanne Wetzel

	Friday, June 10, 2022
9:00am-9:45am	Keynote: Cybersecurity Research at the National Security Agency: Current Directions and Future Challenges (8th floor Ballroom) Dr. Mark Segal, Deputy Director NSA Research Directorate
10:15am	Panel of Technical Directors for the INSuRE Program (6th floor, Chastain HIJ) Session Chair: Susanne Wetzel Timothy Davison, Johns Hopkins University Applied Physics Laboratory Roland Varriale, Argonne National Laboratory Edward Zieglar, National Security Agency
11:15am	INSuRE+C Student Presentations (6th floor Chastain HIJ) Session Chair: Shambhu Upadhyaya 11:15am: Audio Deepfake Detection, Chengzhe Sun, SUNY Buffalo, Ehab AlBadawy, University of Albany, Siwei Lyu, SUNY Buffalo, Timothy Davison, JHU Applied Physics Lab, Sarah Robinson, JHU Physics Lab, Nathaniel Kavaler, JHU Applied Physics Lab 11:45am: Towards a Rigorous Approach for Zero Trust in the 5G Core, Norbert Ludant, Northeastern University, Guevara Noubir, Northeastern University, Marinos Vomas, Northeastern University
12:15pm	Closing Remarks
10:15am-4:00pm	Special Topics Workshop: Transformational Research in Usable Security (Event in Parallel, By Invitation Only) (Chastain C) Workshop Organizers: Heather Lipford, University of North Carolina Charlotte and Cori Faklaris, Carnegie Mellon University Participants: Hana Habib, Carnegie Mellon University, Apu Kapadia, University of Indiana, Frank Li, Georgia Tech, David Maimon, Georgia State University, Michelle Mazurek, University of Maryland, College Park, Xinming Ou, University of South Florida

CAE-CD Schedule

Thursday, June 9, 2022

12:00pm

Fast Pitch Talks – 10 minutes each (rooms run concurrently)

Room 1 (Chastain DE)

Session Chair: Anna Carlin

What is Missing in Cybersecurity Curriculum?

Bo Yuan, Rochester Institute of Technology

OpenStack Private Cloud for Cyber Capstone Development and Implementation Chuck Bane, University of San Diego

Incorporating AI Into Software Reverse Engineering Courses

Xiuwen Liu, Florida State University

Mike Burmester

How to Build Large Student Cyber Clubs

Mike Morris, Western Governor's University

Lessons Learned from the Development of Dual-Enrollment Programs with High Schools

Yair Levy, Nova Southeastern University

CAE-CD is Not the end goal, it is the first door to a world of opportunities for Cyber Initiatives

Shankar Banik. The Citadel

Room 2 (Chastain FG)

Session Chair: Anne Kohnke

Establishing New K-12 Pathways

Andrew Lutz, Johnson County Community College

Micro Transcripts: Quantifiable and Auditable Workforce Readiness Transcripts (WRT) for Internships

Ram Dantu, University of North Texas Mark Thompson

Developing Competency Through Competitions

Dan Manson, Cal Poly Pomona Morgan Zantua

A Final Stop of the CWCT Journey: Training Participant Job Placement with Certifications

Mengjun Xie, University of Tennessee at Chattanooga Stephen Reiter

The UAH Cyber Force Incubator

Tommy Morris , The University of Alabama in Huntsville

The easiest interview answers - your story

Robert Loy, Grand Canyon University

12:00pm

Room 3 (Chastain HIJ)

Session Chair: Margaret Taylor

Cybersecurity Pathways: Implementing a Systems Based Approach Through Mentoring

Lonnie Decker, Davenport University Teha Emmons

Stepping-Stone Intrusion Upstream Detection Using Round Trip Time Distribution Jianhua Yang, Columbus State University

Hierarchical Multi-Blockchain Architectures for Autonomous Management of Medical Data/Devices

Mike Burmester, Florida State University Xiuwen Liu

Critical Infrastructure - Training

Dipankar Dasgupta, University of Memphis Jim McGinnis

Education on Cybersecurity Issues with Smart Power Grid

Mohd Hasan Ali, The University of Memphis

Waleed Farag, Indiana University of Pennsylvania

Benefits from a Novel Outreach Project that Supports Cybersecurity Professional Development

1:20pm

Presentations – 20 minutes each (rooms run concurrently)

Room 1 (Chastain DE)

Session Chair: Greg Laidlaw

Making Knowledge Units Work for Your Program

Art Conklin, University of Houston Seth Hamman

The Lack of Incident Response Curriculum in the CAE Community: Call to Action

Casey O'Brien, University of Illinois Urbana-Champaign David Umphress

ERAU & A-ISAC CTF: Raising Awareness about Aviation Cybersecurity

Jesse Chiu, Embry-Riddle Aeronautical University - Prescott Campus Krishna Sampigethaya

Developing a "Hands On" Security Compliance Course

Joseph Jeansonne, Pitt Community College

CAE-CD Schedule

1:20pm

Presentations – 20 minutes each (rooms run concurrently)

Room 2 (Chastain FG)

Session Chair: Loyce Pailen

Ensuring consistency across the curriculum

Brandy Harris, Grand Canyon University

Mapping of the NERC-CIP Standards with the NIST CSF

Guillermo Francia, University of West Florida

Building a Smart Secure Manufacturing Testbed Using Zero Trust Model, Machine Learning and 5G

Holly Yuan, University of Wisconsin-Stout **Brandon Cross**

RMF vs CSF: Which is Better for Higher Ed?

Matt Paulson, Weber State University

Room 3 (Chastain HIJ)

Session Chair: Kim Muschalek

Ransomware Incident Preparations with Ethical Considerations and Command System Framework Proposal

Stanley Mierzwa, Kean University

Meeting the Cybersecurity Workforce Challenge: One Goal, Innovative Solutions

Eman El-Sheikh, University of West Florida Michael Tu, Purdue University Northwest Andrew Wright, University of Louisville

Mapping Low Cost and Open Source Labs to the NICE Workforce Framework Chris Simpson, National University

Cyber Sleuthing: An Introduction to Cybersecurity Using Gamification

Curtis Coleman, Oklahoma Christian University

2:45pm

Break

3:00pm	Presentations – 20 minutes each (rooms run concurrently)
	Room 1 (Chastain DE) Session Chair: Jake Mihevc
	Long and Winding Road: Navigating to a Cybersecurity Performance Based Education (PBE) Curriculum Norma Colunga-Hernandez, Texas State Technical College in Harlingen Amy Hertel
	Program of Study Validation: Cybersecurity Concentration at FDU Ihab Darwish, Fairleigh Dickenson University
	K12-University Cybersecurity Education Partnership Best Practices Deveeshree Nayak, University of Washington
	Colorado's Cybersecurity Educational Diversity Initiative (CEDI): Urban/Rural HSIs & the Wild West Jeffrey London, MSU Denver Steve Beaty
	Room 2 (Chastain FG) Session Chair: Wei Li
	Mininet as a Networking Tool for simulating 4 different Cyber Attacks: Experimental Results George Meghabghab, Roane State
	Computer Forensics Teaching Resources Jeffrey Duffany, Polytechnic University of Puerto Rico Alfredo Cruz
	"A Slice of Raspberry Pi Dessert for GenCyber Teachers" Loyce Pailen, University of Maryland Global Campus Kimberly Mentzell
	Room 3 (Chastain HIJ) Session Chair: Tobi West
	Honeypots and Knowledge Discovery in Teaching Network Defense Ping Wang, Robert Morris University
	Stepping-Stone Intrusion Detection using Crossover Packets Lixin Wang, Columbus State University
	The Applications of Internet of Things in the Medical Field Lixin Wang, Columbus State University
4:45pm	Break
5:00pm-9:00pm	Sponsor Mixer 6th Floor (Hors d'oeuvres and Sponsors' Presentations)

CAE-CD Schedule

	Friday, June 10, 2022
8:00am	Working Breakfast (8th floor Ballroom)
8:30am	CAE Community service recognitions (8th floor Ballroom)
9:00am	Keynote (8th floor Ballroom)
9:45am	Keynote Q&A (8th floor Ballroom)
10:00am	Morning Break
10:15am	Panel Presentation (8th floor Ballroom) Session Chair: Gretchen Bliss The "Power of Six": Creating Cyber Experiences and Building a Diverse
	Talent Workforce Pathway Sharon Hamilton, Norwich University Linda Riedel, The Citadel Bryson Payne, University of North Georgia
11:00am	New CAEs and New POCs Meet-and-Greet with welcome by Lynne Clark (8th floor Ballroom)

CAE-CO Schedule

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	Thursday, June 9, 2022
12:00pm-2:45pm	CO CoP Meeting (CO POCs only) (6th floor Chastain C) The Cyber Operations Community of Practice will discuss the new application process, the KUs, and other topics of interest. The NSA PMO will be in attendance. This meeting is limited to CO POCs only. (Contacts: Drew Hamilton and Seth Hamman)
3:00pm-4:45pm	CO Designation Criteria (open to all) (6th floor Chastain C) The Cyber Operations designation is open for applications. During this session, we will review the designation criteria, how to know when you are ready to apply, and where to find helpful resources. There will be ample time for Q&A. Moderated by Drew Hamilton, Seth Hamman, and the NSA PMO.

Access this Week's Presentation and Fast Pitch Abstracts



Thank you to the CAE Program Committees

As the Community grows, so do the needs. Each year, the demand for collaboration and cooperation increases as we welcome more newly designated colleges and universities. The Symposium couldn't happen without help from our dedicated faculty committees who spend hours reviewing submissions and ensuring that content shared to the Community is relevant and valuable. If you see one of our committee members this week, please take a moment to thank them for their service to the Community.

CAE-CD Program Committee

Tobi West - Coastline Community College, 2022 CAE-CD Planning Committee Co-Chair Gretchen Bliss - University of Colorado Colorado Springs, 2022 CAE-CD Planning Committee Co-Chair Anne Kohnke - University of Detroit Mercy, 2022 CAE-CD Planning Committee, Member Yair Levy - Nova Southeastern University, 2022 CAE-CD Planning Committee Member Margaret Taylor - College of Southern Nevada, 2022 CAE-CD Planning Committee Member Paul Wagner - The University of Arizona, 2022 CAE-CD Planning Committee Member

CAE-CO Program Committee

Seth Hamman – Cedarville University, 2022 CAE-CO Program Planning Co-Chair Drew Hamilton – Texas A&M University, 2022 CAE-CO Program Planning Co-Chair

CAE-R Program Committee

Agnes Chan - Northeastern University, 2022 CAE-R Planning Committee Co-Chair Susanne Wetzel – Stevens Institute of Technology, 2022 CAE-R Planning Committee Co-Chair

CAE-C Community Leads

Northeast

Hub Lead: Blair Taylor (btaylor@towson.edu) **Hub Lead:** Sidd Kaza (SKaza@towson.edu) **Hub Lead:** Jake Mihevc (JMihevc@mvcc.edu)

Hub Lead: William Butler (whbutler@captechu.edu)

Northwest

Hub Lead: Gretchen Bliss (gbliss@uccs.edu) **Hub Lead:** Gurvinder Tejay (gtejay@uccs.edu)

Midwest

Hub Lead: John Sands (sands@morainevalley.edu) **Hub Lead:** Stanley Kotska (kostkas@morainevalley.edu)

Southwest

Hub Lead: Kim Muschalek (kmuschalek@alamo.edu) **Hub Lead:** Glenn Dietrich (Glenn.Dietrich@utsa.edu)

South Fast

Hub Lead: Eman El-Sheikh (eelsheikh@uwf.edu) **Hub Lead:** Anthony Pinto (apinto@uwf.edu)

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CoP Lead: Yair Levy (levvy@nova.edu)

CoP Lead: Anne Kohnke (kohnkean@udmercv.edu)

CAF-CO

CoP Lead: Seth Hamman (shamman@cedarville.edu) **CoP Lead:** Drew Hamilton (hamilton@exchange.tamu.edu)

CAE-R

CoP Lead: Agnes Chan (ahchan@ccs.neu.edu) **CoP Lead:** Susanne Wetzel (swetzel@stevens.edu)

To learn more about the CAE in Cybersecurity Community, visit caecommunity.org







Thank you for attending the 2022 CAE in Cybersecurity Community Symposium! All materials from the symposium will be available to view on the CAE in Cybersecurity Community website at caecommunity.org. If you have any questions, comments, or concerns, please contact us at info@caecommunity.org