

CAOE | CENTER FOR ACCELERATING OPERATIONAL EFFICIENCY

A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE

QUARTERLY NEWSLETTER • FEBRUARY 2023



Letter from the Director



The CAO E team and I would like to thank you for your continued support of the CAO E in our mission to develop analytical tools and technologies that provide real-time impact to improve homeland security operations as well as educating the future DHS workforce. Our success in achieving this mission continues to be a function of our support from DHS S&T, our DHS stakeholders within the component agencies, industry partners and the collaborative efforts with our academic partners. Without the active support and feedback from all of you, it

would be impossible for our research and education initiatives to experience the success we have achieved throughout the first 5-1/2 years of the center.

Here are a few highlights of the accomplishments of the CAOE:

- Over 115 undergraduate and graduate research students were directly involved in research projects and over **60 students from Minority Serving Institutions** participated in CAOE education activities through our summer program or as student researchers.
- **Two CAOE projects were accepted by DHS for the initial phase 2022 Cohort competitive review nomination Homeland Security Start-Up Studio (HSSS)** sponsored by DHS OUP and FedTech: Dynamic Resource Allocation for Predicted Demands at a Network of Screening Facilities and Simulation, Analysis and Modeling for Border Apprehension and Security (SAMBAS).
- **Over 50 publications and presentations** were published and presented at conferences including the INFORMS Annual Conference, The Institute of Industrial Systems Engineers (IISE), and the Society for Risk Analysis.
- **CAOE hosted two successful workshops:** *Future of Risk Research for Homeland Security* and *Privacy Enhancing Technologies for the Homeland Security Enterprise*. These workshops averaged 75–100 people per session with many DHS stakeholders in attendance.
- **Our annual hackathon** was very successful with collaboration from five COEs and students from seven schools participating. We are co-hosting the event this year with our new partner COE SENTRY led by Northeastern University. The event has been rebranded as **DASSH - Designing Actionable Solutions for a Secure Homeland**.

I would also like to introduce the new Co-Director for CAOE, Adolfo Escobedo. In the fall of 2022, I was approached to expand my responsibilities within ASU's Ira A. Fulton Schools of Engineering and I recently accepted the role of Director for the School of Computing and Augmented Intelligence. Given this change in my role, I'm pleased to announce the addition of Dr. Adolfo Escobedo as Co-Director for the CAOE. There is

more information on Dr. Escobedo later in this newsletter.

Looking back, I am amazed by the impact that the CAO E has achieved during these uncertain times and I look forward to all that is to come this year.

Thank you again for your partnership and support of the CAO E and I wish you a healthy and happy year ahead.

Ross

Adolfo Escobedo joins CAO E as Co-Director



The Center for Accelerating Operational Efficiency is pleased to announce the addition of Dr. Adolfo Escobedo as Co-Director for the CAO E. Dr. Escobedo is an educator and researcher in the field of industrial engineering and operations research. His research interests are in the theory and application of mathematical programming and computing, specifically in the design and analysis of algorithms for sustainable infrastructure planning, circular economy, computational social choice and crowdsourcing, and computational linear algebra

Dr. Escobedo is an Assistant Professor in the School of Computing and Augmented Intelligence at Arizona State University. He received a doctorate in industrial and systems engineering from Texas A&M University in 2016 and a bachelor's in mathematics from California State University Los Angeles in 2009. In conjunction with Erick Moreno-Centeno, Christopher Lourenco, and Timothy A. Davis, he received the 2021 INFORMS Computing Society (ICS) Prize for his work on roundoff-error-free matrix factorization.

Dr. Escobedo has been involved with CAO E through both research projects and

supporting the educational efforts of the center. One past project led by Dr. Escobedo focused on improving baggage screening effectiveness and is featured on the [CAOE YouTube channel](#). Dr. Escobedo is also currently the lead PI on a new pilot project with the USCIS.

"I've enjoyed working with the CAOE as a researcher and seeing the real-world impact that research can have on homeland security challenges. I'm excited to take on this new role for the center and look forward to continue to work with our DHS stakeholders and our academic and industry partners", stated Escobedo.

Please welcome Adolfo to the CAOE leadership team!



CAOE and SENTRY join forces to lead DASSH student design challenge

Registration is now open for the **DASSH (Designing Actionable Solutions for a Secure Homeland)** student design challenge. This event presents students with several real-world problem statements impacting homeland security and gives students the opportunity to design, build and implement innovative solutions that will be presented to DHS leadership. This year's theme is protecting America's Public Access Areas and is being organized by CAOE and SENTRY (Soft Target Engineering to Neutralize the Threat Reality) Centers of Excellence.

Experts from DHS, local government, industry and academia will be presenting skills training and mentoring students during the event. Cash prizes will be awarded to the top teams. This will be a hybrid event with students interacting in-person at the participating schools and mentors and judges joining virtually via Zoom and Discord.



Trust, but verify: The quest to measure our trust in AI

Artificial intelligence is a growing presence in our lives and has great potential for good — but people working with AI systems may have low trust in them. One CAO

research team is testing a tool that could help government and industry identify and develop trustworthy AI technology. [READ MORE](#)

RESEARCH GRANTS REQUEST FOR PROPOSALS



Risk Science

CAOE is seeking proposals to improve DHS management of homeland security risks.

The Department of Homeland Security (DHS) has multiple priorities that benefit from risk science research ranging from catastrophic natural disasters, terrorist events, and customs processing, to immigration services and beyond. To properly manage these priorities there is a need for understanding the wide range of risks across the Homeland Security Enterprise (HSE).

CAOE is specifically interested in proposals that will support risk identification and characterization, risk assessment and analysis, risk management and governance, and/or risk perception and communication.

Proposals should address at least one of the following research areas:

- Understanding and Enhancing the Effectiveness of Risk Approaches
- Proactive Identification and Assessment of Emerging Risks

- Efficient Incorporation of Emerging Technologies
- Organizational Integration and Coordination in the Risk Space.
- Fostering and Incorporating Human and Social Understanding into the Risk Enterprise.
- Translating Risk Analyses into Effective Decisions

A formal proposal review process, including evaluation by external subject matter experts, will be conducted to select those for which a grant award will be offered.

Deadline: March 20, 2023

Specific questions about this request for proposals should be addressed in writing to Adolfo Escobedo Co-Director of the CAO, at caoe@asu.edu



Privacy-enhancing technologies (PETs) under development promise the ability to control the sharing and use of sensitive information while minimizing the risk of unauthorized use. These technologies have been under development by researchers for nearly four decades but have been slow to migrate from the research lab into operational use. In this seminar series, we invite luminaries from across the globe to discuss the state-of-the-art in privacy enhancing technologies describing challenges, opportunities, and advancements with respect to technology development and uptake.

Next Seminar

February 9 , 2023 - 12pm EST

To Share or Not to Share: What Context Affects Users' Decisions to Share Information or Protect their Privacy

Dr. Alisa Frik

Research Scientist

International Computer Science Institute (ICSI)

Postdoctoral Fellow

Berkeley Laboratory for Usable and Experimental Security (BLUES)

University of California Berkeley

Website: <https://www1.icsi.berkeley.edu/~afrik/>

Upcoming Speakers

March 9, 2023 - 12pm EST

Laura Brandimarte

Assistant Professor of Management Information Systems

Eller College of Management

University of Arizona

<https://eller.arizona.edu/people/laura-brandimarte>

May 18, 2023 - 12pm EST

Lorrie Cranor

FORE Systems Professor

Engineering & Public Policy, and School of Computer Science

Director and Bosch Distinguished Professor in Security and Privacy Technologies,

CyLab Usable Privacy and Security Laboratory

Co-director, MSIT-Privacy Engineering Masters Program

Carnegie Mellon University

<https://www.cmu.edu/epp/people/faculty/lorrie-faith-cranor.html>

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Undergraduate Summer Experience Quantitative Analytics (SEQAL)

Program Dates
June 5 - June 30, 2023 (M-F)

Applications Due
March 14
[Apply Here](#)

The diagram illustrates the DMAIC process across five phases:

- DEFINE:** Draft Charter, Complete SIPOC, Collect Voice of Customer Data, Identify Critical to Quality Measures, Plan Project.
- MEASURE:** Map Process, Collect Voice of Process Data, Plot Time, Frequency & Category Data, Calculate Capability, (Re)Focus Problem Statement.
- ANALYZE:** Brainstorm Potential Causes, Organize & Select Potential Causes, Analyze Cause & Effect Data, Verify Root Causes.
- IMPROVE:** Brainstorm Possible Solutions, Prioritize & Select Solution(s), Develop Plans, Implement Fixes, Evaluate Fixes & Revise Solution, Initiate Full Scale Plan.
- CONTROL:** Change Management, Document Process Changes, Initiate Process Dashboard, Summarize Lessons Learned, Recommend Future Projects.

CAOE Undergraduate Summer Experience (SEQAL) 2023 - June 5 - June 30

Application deadline: March 14, 2023

CAOE is now accepting applications for the CAOE Summer Experience in Quantitative Analytics(SEQAL). This STEM-based paid program combines significant data analytics training with real-world problem solving.

Program Details

This four-week research experience will be virtual with no travel requirements. Students will spend approximately six hours each day, Monday through Friday, with a combination of live expert-led workshops and group interactive problem-solving and data processing.

- \$3000 stipend for completing the entire program
- Work on realistic problems facing The Department of Homeland Security
- Learn new tools and methodologies including data analytics, decision analysis, simulation, and operations research including the development of a stochastic simulation model

- Opportunity to network with other students, faculty, and technology experts from around the country

Key Dates

Application Window: **January 17 - March 14, 2022**

Program Dates: **June 5 - 30, 2023**

Jun Zhuang named Society for Risk Analysis Fellow



Jun Zhuang a CAOE researcher and professor at University of Buffalo has been selected as a Society for Risk Analysis Fellow based on his internationally recognized research on homeland security creating data-driven models to help decision makers mitigate risks.

Society for Risk Analysis is an international multidisciplinary, interdisciplinary, scholarly society that provides an open forum for all those who are interested in risk analysis. The organization brings together individuals from diverse disciplines and from different countries and provides them opportunities to exchange information, ideas, and methodologies for risk analysis and risk problem solving. [**READ MORE**](#)

Upcoming Events

February 15-16 - CAOE Annual Meeting

February 24-26 - DASSH Student Event

June 5-30 - CAOE Undergraduate Summer Experience (SEQAL) 2023



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