## International Workshop on the Challenges in Cybersecurity Education

### October 30, 2023

### Georgia Cyber Center, Augusta, Georgia, USA

The **International Workshop on the Challenges in Cybersecurity Education** is co-located with the 22nd International Conference on Cryptology and Network Security (CANS) spans current advances in all aspects of cryptology, data protection, and network and computer security. Hosted by the School of Computer and Cyber Sciences, CANS 2023 and the workshop will be held on the Riverfront Campus of Augusta University, Augusta, Georgia, USA.

The International Workshop on the Challenges in Cybersecurity Education addresses workforce cybersecurity education needs and challenges from the European and the US perspectives. The workshop features invited speakers who will address cybersecurity education initiatives and existing programs in the European/US space. The relevant topics encompass the entire spectrum of cybersecurity training and education: K-12, two-year and four-year degree programs, graduate programs, and professional training. Included in the scope of the workshop is the role of Department of Homeland Security/Cybersecurity & Infrastructure Security Agency and the National Security Agency in developing the US academic response to cybersecurity education through the Centers of Academic Excellence program.

The program includes invited presentations (in-person and remote), and a panel discussion.

For more information and to register: https://www.augusta.edu/ccs/conferences/cans2023/

The workshop is supported in part by the NSF Engines Development Award 2306109.

## Program

**International Workshop on Challenges in Cybersecurity Education**
October 30th, 2023, Georgia Cyber Center, Augusta, Georgia, USA

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| 9:15 | | **Welcome** |
| 9:30 | | **European Perspective** |
| 9:30 | 10:00 | Chris McDermott, United Kingdom |
| 10:00 | 10:30 | Roberto Baldoni, Italy |
| 10:30 | 11:00 | Bill Buchanan, United Kingdom |
| 11:00 | 11:20 | Michael Nowatkowski – Collaboration with France |
| | | **US Perspective** |
| 11:20 | 11:50 | Joanne Sexton, Augusta University |
| 12:00 | 1:00 | **Lunch** |
| | | **US Perspective** (continued) |
| 1:05 | 1:35 | Melissa Dark, DARK Enterprises |
| 1:40 | 2:10 | Roberto Perdrsci, University of Georgia |
| 2:15 | 2:45 | Jim Poarch, Augusta Technical College |
| 3:20 | 3:30 | **Break** |
| 3:30 | 5:00 | **Panel**:<br>Ashley Gess, University of South Carolina<br>Michael Nowatkowski, Augusta University<br>Roberto Perdrsci, University of Georgia<br>Jim Poarch, Augusta Technical College<br>Eric Toler, Georgia Cyber Innovation and Training Center |
| 5:30 | 7:00 | **Reception** |

Information on the Invited Speakers and Panelists follows.

**Roberto Baldoni** served as the inaugural General Director of the National Cybersecurity Agency (ACN). He was appointed to the directorship in August 2021 by Prime Minister Draghi. He resigned in March 2023 during Prime Minister Meloni's administration. From December 2017 to August 2021, he served as Deputy Director General of the Information Department for Security. In these capacities, he had the responsibility of developing the National Cybersecurity Architecture and orchestrating coordinated responses to cyberattacks with implications for national security.

Before 2017, Roberto Baldoni held a Full Professor position of Computer Science at La Sapienza University of Rome from 2003. During this time, he founded in 2010 and directed Italy's first research center focused on "Cyber Intelligence and Information Security" and in 2014 the National Research Center of Cybersecurity under the umbrella of the Italian University Consortium for Informatics (CINI).

**Presentation Title**: *The Italian National Approach to Enhancing Cybersecurity Skills*

**Abstract**: Many industrialized nations face the urgent challenge of building a robust cybersecurity workforce. They're a critical component of our defense against the ever-evolving landscape of cyber threats. This indispensable workforce primarily comprises technical experts, but it also demands a diverse array of professionals ranging from social and psychological scientists to legal and political scholars. In the area of technical skills, it's not just about cultivating talent in computer science and engineering. There's a growing demand for specialized, hands-on training initiatives that equip individuals with specific, practical skills in a relatively short time frame, in addition to programs that seamlessly blend job experience with skill development. This presentation will highlight Italy's strategic efforts to strengthen its cybersecurity capabilities, emphasizing Italy's central role in the national cybersecurity strategy. It'll shed light on the multifaceted approach Italy is taking to address this complex challenge.

**William (Bill) J Buchanan** OBE is a Professor in the School of Computing at Edinburgh Napier University, and a Fellow of the BCS and Principal Fellow of the HEA. He was appointed an Officer of the Order of the British Empire (OBE) in the 2017 Birthday Honours for services to cybersecurity. Bill lives and works in Edinburgh and is a believer in fairness, justice, and freedom. His social media tagline reflects his strong belief in changing the world for the better: "A Serial Innovator. An Old World Breaker. A New World Creator." He also has a strong belief in the power of education and in supporting innovation from every angle, and currently leads the Blockpass ID Lab and the Centre for Cybersystems, IoT and Cyberphysical. Bill works in the areas of blockchain, cryptography, trust and digital identity. He has one of the most extensive cryptography sites in the World (asecuritysite.com), and is involved in many areas of novel research and teaching. Bill has published over 30 academic books and over 300 academic research papers. Along with this, Bill's work has led to many areas of impact, including three highly successful spin-out companies (Zonefox, Symphonic Software and Cyan Forensics), along with awards for excellence in knowledge transfer and for teaching. Bill recently received an "Outstanding Contribution to Knowledge Exchange" award and was included in the FutureScot "Top 50 Scottish Tech People Who Are Changing The World".

**Melissa Dark** has worked in cybersecurity education for the past 23 years.  She has led several creative and impactful projects.  Her early work in cybersecurity education focused on the graduate level and has progressively grown down to community college, and now high school, in response to two needs: robust cybersecurity literacy among all cybercitizens and closing the cybersecurity workforce gap. She was a professor and associate dean at Purdue University.  In 2015, she founded DARK Enterprises, Inc., a non-profit that focuses on cybersecurity education Development, Assessment, Research and Knowledge Transfer.

**Presentation Abstract:** The number of open positions requesting cybersecurity-related skills continues to grow, while employers struggle to find skilled workers. As the cyber workforce demand rises, the talent pipeline is limited.  One approach to building the talent pipeline has been to start cybersecurity courses in high school.  This talk reports on a research study called CyberSupply that finds only 15% of US public high schools offer a cybersecurity course and only 11% of Georgia public high schools do (cybersupply.org).

**Ashley Gess**, Ph.D. is an Assistant Professor of STEM and STEAM Education at the University of South Carolina where she is Co-Coordinator of the Ed.D. in Integrated STEM Education. Gess holds a Ph.D. in Curriculum and Instruction with an emphasis in Integrative STEM Education from Virginia Polytechnic and State University. Prior to working as a professor of Education, Gess spent 15 years in the K-16 science classroom as a Chemistry teacher and Biology professor. Influenced by her 20 years of being in the science and science education classroom, Gess focuses her research primarily toward understanding cognitive and behavioral impacts of the design process on teachers, students, and others in professional practice. Additionally, she is particularly interested in how the Integrative STEM and STEAM educational approaches (anchored in the design process) may be utilized to promote authentic, faith-based education. She regularly publishes, speaks, and consults in regional, national, and international venues on the STEM and STEAM educational approaches and the centrality of the design process in professional practice.

**Chris McDermott** is a cybersecurity lecturer and researcher in Human-centred Security at Robert Gordon University (Scotland). He teaches across both the undergraduate and postgraduate programs focusing on Social and Human Factors in Security, Security by Design, and Network Security. Additionally, he leads the Human Factors in Security research team, exploring questions at the intersection of humans and digital technologies. This work focuses on modelling threats and embedding usable security solutions into the design of software to enhance situational awareness and foster a culture of secure behaviour.

**Presentation Title**: *The challenge of teaching cybersecurity in education*

**Abstract**: In this brief talk, we will explore the unique obstacles educators face, from staying ahead of rapidly changing technologies and threat landscapes, to ensuring students are engaged and able to apply theoretical knowledge in real-world scenarios.

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**Michael Nowatkowski** is a Professor, Head of the Cyber Programs of Study, and Director of the Cyber Institute with the Augusta University School of Computer and Cyber Sciences. He leads the Augusta University efforts on the Center of Academic Excellence program, the Department of Defense Cyber Scholarship Program, the National Science Foundation CyberCorps® Scholarship for Service program, the VICEROY award, the National Centers of Academic Excellence in Cybersecurity Virtual Internship and Competitions grant, and the National Cybersecurity Workforce Development Program. He holds a PhD and Master of Electrical and Computer Engineering from Georgia Institute of Technology and a Bachelor of Science in Electrical Engineering from Rose-Hulman Institute of Technology. He retired from the Army with over 26 years of service, including eight years teaching at the United States Military Academy at West Point. His research interests include industrial control system security, medical device security, electronics, and cyber operations education.

**Presentation Title**: *International Internship Collaboration with the Military Academy of Saint-Cyr Coëtquidan*

**Abstract**: Augusta University serves as a host for French cadets from the Military Academy of Saint-Cyr Coëtquidan as they complete requirements for their masters degree. This talk will briefly discuss the program and the accomplishments of the cadets since the program started in 2021.

**Roberto Perdisci** Roberto Perdisci is Patty and D.R. Grimes Distinguished Professor in Computer Science at the University of Georgia, where he directs the UGA Institute for Cybersecurity and Privacy. His research interests include network and web security, malware defense, security applications of AI, IoT security, and telephony security.

   Prof. Perdisci is the recipient of a 2012 NSF CAREER Award, and of the 2015 UGA Fred C. Davison Early Career Scholar Award. He has published over sixty peer-reviewed papers, many of which have appeared in the most selective computer security and systems conferences and journals. His research has been sponsored by grants from the National Science Foundation, the US Department of Homeland Security (DHS), DARPA, and an industry grant from Intel. His past research on malware download defenses was selected by DHS for the Technology Transition to Practice (TTP) program, and has been promoted at prestigious industry venues, including the RSA Conference.

**Presentation Title**: *Cybersecurity and Privacy Education at UGA – Challenges and (a few) Solutions*

**Abstract**: Since 2017, the University of Georgia has established the Institute for Cybersecurity and Privacy (ICSP). Recently, the ICSP partnered with the School of Computing (SoC) to establish three educational programs in cybersecurity and privacy: an MS program, a Double Dawgs (4+1) program, and an Undergraduate Certificate. This talk will discuss some of the challenges faced in establishing these programs, attracting new students, expanding the course offerings,  and securing funding for scholarships. Also, it will present a few solutions that have been implemented so far to increase the number of domestic graduate students and to make the programs multidisciplinary.

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Mr. **Jim Poarch** is the director of the Augusta Tech Cyber Institute and is the department head for the Augusta Technical College Cybersecurity program.  He has been working with digital technologies almost his whole career, which began in the 70's.  Prior to his career at Augusta Technical College, he worked as a Senior Manufacturing Engineer where he integrated advanced digital technologies into manufacturing processes.  In the past 30-plus years he has been instrumental in implementing the cyber and related programs taught at Augusta Technical College.  Over the years he taught various computer-aided design, electronics, management, programming, computer support, networking, and cybersecurity classes.  He is the chairperson of the Technical College System of Georgia Instructional Faculty Consortium Committees Cybersecurity group.  He has a BS in Computer Science and a Masters in Computer Resources Management.  He has earned multiple IT industry certifications.

**Presentation Abstract**: Augusta Technical College is a 2-year technical college which is 1 of 22 technical colleges that make up the Technical College System of Georgia: TCSG.   The college is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC).  The ATC Cybersecurity AAS program is recognized as a Center of Academic Excellence in Cyber Defense (CAE-CD) by the NSA, CISA, and other federal agencies securing our national infrastructure.  ATC's Cybersecurity program has been successful and has turned out hundreds of gainfully employed students, but it has not been without its challenges.  Mr. Poarch will be discussing the college's cybersecurity successes as well as its challenges.  Some of our challenges are universal and some are unique to 2-year colleges.

**Joanne Sexton** is the founding Director of Augusta University's Cyber Institute created in 2015 and an Augusta University Professor Emerita. Joanne Sexton led the development of Augusta University's cybersecurity academic programs, designation as a NSA/DHS Center of Academic Excellence in Cyber Defense Education, and expanded cyber programs, research, and outreach across the university.

**Presentation Title**: *Role of Department of Homeland Security/Cybersecurity & Infrastructure Security Agency and the National Security Agency in developing the US academic response to cybersecurity education through the Centers of Academic Excellence program.*

**Abstract**: In the United States, government entities have been critical to expanding cybersecurity education throughout the US educational system.  The presentation will focus on the Centers of Academic Excellence program and its role in developing K-12, technical colleges, and university contributions to expanding the cybersecurity workforce.

Colonel (Retired) **Eric Toler** joined Augusta University in 2018 as Executive Director of the Georgia Cyber Center.  Mr. Toler previously served in the U.S. Army as a Military Intelligence Officer, retiring with over 27 years of leadership and national security experience.  During his military career, he was a pioneer in leading and developing cyberspace operations capabilities for the Army and Department of Defense, serving in key positions within Army Cyber Command, U.S. Cyber Command, and the National Security Agency.

   In his role as Executive Director of the Georgia Cyber Center, he is responsible for fulfilling the mission of the Georgia Cyber Center to create an ecosystem of collaboration among government, academia, and private sector partners that helps solve the nation's most challenging cybersecurity problems through innovative education, training, research and development, and practical applications.

   In addition to numerous military schools and training, Mr. Toler holds a Bachelor of Science in Chemistry from Henderson State University, a Master of Public Administration from the University of Kansas, and a Master of Science in National Security Strategy from National Defense University. He has numerous military awards and decorations, to include the Defense Superior Service Medal, the Legion of Merit, and two Bronze Star Medals.

**Presentation Title:** *Cultivating a National Culture of Cybersecurity*

**Abstract:** Global cyber threats are outpacing the ability of Western democracies to mitigate or defeat those threats.  The cyber capabilities of adversarial nation states have vastly improved in the last decade while cybercrime is set to become the third largest economy in the world by 2025.  At the same time, the global cyber workforce gap continues to grow at an alarming pace.  These trends, coupled with sluggish bureaucratic reaction speed, will nullify the U.S. and its ally's dominance in the information environment in the next few years – unless we do things differently.  This presentation will highlight why the status quo has led to many national shortcomings in cybersecurity and discuss why it is an existential imperative to start cultivating a national culture of cybersecurity today.

**Remote participation information**

The Zoom meeting information for Room 1 is as follows.

**Zoom**

https://augusta-edu.zoom.us/s/99929164144

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