ANNUAL REPORT
2018-2019

Cybersecurity Education Solutions for the Nation

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EXECUTIVE DIRECTOR’S MESSAGE

"Dear Colleagues,

I look forward to writing this Annual Report each spring, as it allows me and the National CyberWatch (NCC) team to take stock of the many accomplishments from the past year, as well as recognize the people that helped along the way.

There are some themes that present themselves as you read through this report: the un-paralleled experience of the NCC team; the longevity of many of the NCC programs; the voluminous high-quality output year-over-year, on essentially shoe-string budgets; and the continued growth in numbers of students and faculty, as well as academic member institutions served.

You’ll also hear the powerful stories from those that have benefited from our collective work, and see the ways we are moving the needle towards solving some of our country’s biggest workforce and national security challenges. Answers to questions “What were the results of our work last year?” “What differences did it make?” will be answered.

My hope is to connect the everyday activities of the NCC to our mission so you can glimpse through the same lenses we use to decide how we spend our time and what projects to focus on; those that ultimately advance cybersecurity education and strengthening the national cybersecurity workforce.

These successes are not possible without the support of the dedicated NCC team, our academic network of higher education institutions, faculty, students, industry, and government partners, and the senior leadership team at Prince George’s Community College, especially Dr. Charlene Dukes and Dr. Clay Railey. We are also grateful for the ongoing support of our National Science Foundation Program Officers, Dr. Corby Hovis and Dr. Victor Piotrowski, as well as our National Visiting Committee members.

As NCC builds on its 14-year foundation of success, there’s tremendous opportunity for a partnered approach that:

- Focuses on creating value through products and services that get applied broadly across various industries
- Continues the sustainability work to position NCC for the long-term
- Expands opportunities for the Center to scale ideas and attract new sources of funding
- Integrates business into the NCC “equation,” and
- Enhances the unique learning needs to combat ever-changing and damaging attacks on our personal data and critical infrastructure

Sincerely,

Casey W. O’Brien
Executive Director & Principal Investigator, National CyberWatch Center
ACCOMPLISHMENTS

APPRENTICESHIPS: SKILL UP TO SCALE UP

NCC began a research project to investigate interest across the country in a new concept for scaling apprenticeship programs called *Skill up to Scale Up*. Under this program, incumbent IT workers will take part in virtual upskilling programs - assessment, personal development planning, training, job rotation, and on-the-job learning - that provide continual evaluation of the readiness to perform more demanding job responsibilities.

COMMUNITY COLLEGE CYBER SUMMIT (3CS)

3CS continues to meet the need for a national academic conference that focuses on cybersecurity education and workforce development at the community college level.

The 2018 3CS was held at Mt. Hood Community College, Gresham, Oregon, August 2-4, 2018. This was the first Summit on the West Coast. NCC and its co-producers: Center for Systems Security and Information Assurance (CSSIA), CyberWatch West, and BATEC (Broadening Advanced Technological Education Connections), attracted new sponsors, new employers for the Student Job Fair, and new attendees. Highlights included:

- Theme: Expanding Expertise - Transforming Cybersecurity Programs
- Pre-Summit Job Fair: Aug. 2
- NCC Executive Director/PI briefing with sponsors and NCC partners
- Launch of the NCC Cybersecurity Skills Journal: Practice and Research (csj.nationalcyberwatch.org)
- Record number of sponsors
- Four tracks: New to Cybersecurity; Experienced in Cybersecurity; Expanding Expertise; and Student Track

“Educational, inspirational and outstanding great experience for those students that are near or in the midst of finishing their Cyber security degrees”
- Cyndie Ramirez, Student
  Southern New Hampshire University

“Amazing conference with the most passionate colleagues dedicated to keeping our nation secure.”
- Karen Wosczyna Birch, Executive Director
  Regional Center for Next Generation Manufacturing
CYBERCORPS® SCHOLARSHIP FOR SERVICE (SFS) PATHWAYS PROJECT

Scholarship for Service (SFS) is a long-established National Science Foundation program (with support from the Dept. of Homeland Security and the Office of Personnel Management) that provides full scholarships to students enrolled in selected four-year universities (and now, partner community colleges), and a requirement that the student work for at least an equal number of years in federal, state, local, or tribal government agencies as the scholarship funding.

One of the objectives of the NCC Pathways Project was to track the performance of the participating two- and four-year schools and provide NSF with observations and suggestions for strengthening the program. Existing degree articulations or transfer agreements between the associate and bachelor degree programs were part of this data collection effort.

The CyberCorps® Scholarship for Service (SFS): Participant Institutions and Their Articulations with 4-YR Institution Partners Resource Guide (www.nationalcyberwatch.org/resource/sfs2019), published via the NCC Digital Press, contains a collection of course requirements associated with articulations and transfer agreements that have been shared with the NCC researchers from all but one of the twenty-four (24) participating institutions, with the expectation that they might provide schools interested in duplicating the Pathways experiences with a roadmap to examples of linkages between community colleges and universities.

CYBERSECURITY SKILLS JOURNAL: PRACTICE AND RESEARCH

In August 2018, NCC launched the world’s first double-blind, peer reviewed journal dedicated to the scholarly analysis of cybersecurity education and professional practice, the Cybersecurity Skills Journal: Practice and Research (CSJ). The journal’s first issue was a Special Issue to commemorate the fifth-year anniversary of the 3CS, “3CS Anniversary Special Issue: Five Years of Raising the Capability Maturity Bar.” The goal of the CSJ is to stimulate professional discussion and advance the interdisciplinary field of cybersecurity through the publication of scholarly works of value and interest to the profession. The CSJ seeks to integrate and expand the methods, processes, and evidence of effective practices which underlie skilled performance. The CSJ focuses on valued, measured results; considers the larger system context of people’s performance; and provides valid and reliable measures of effectiveness.
DIGITAL PRESS

The following publications were published through the NCC Digital Press, which produces and disseminates collections of timely publications related to cybersecurity education:

- Cybersecurity Skills Journal: Practice & Research, Vol. I, Issue 1: 3CS Anniversary Special Issue: Five Years of Raising the Capability Maturity Bar
- Guide and Workbook for Completing CAE Criteria - Associate Level (funded by National Security Agency Grant # H98230-17-1-0231)
- Participant Institutions and Their Articulations with 4-YR Institution Partners Resource Guide
- 2018 Innovations in Cybersecurity Education booklet

INNOVATIONS IN CYBERSECURITY EDUCATION AWARDS & RECOGNITION PROGRAM

The 2018 Innovations program continues to build on the previous year’s lessons learned and successes. The deadline for application submissions was May 21, 2018. Shortly after, a panel of cybersecurity educators and NCC partners reviewed the submissions, 67 in total (up from 44 last year), and selected five for recognition at the 2018 3CS in Portland. 2018 Innovation Winners by Category:

**Curriculum:** “Community Initiative Center of Excellence for Secure Software (CICESS) - Employer-led Secure Software Development Dual Model Apprenticeship Partnering with Community Colleges.” Submitted by Illinois Central College: Girish Seshagi (ISHPI Info. Technologies), Nancy Mead (Carnegie Mellon University), and Julie Howar (Illinois Central College)

**Faculty Development:** “Industrial Control Systems Security Curriculum Resource Kit.” Submitted by Jacksonville State Uni.: Dr. Guillermo Francia

**Lab Activity:** “Have My Smart Lightbulbs Been Weaponized: Introducing Computer Security Issues Related to IoT Devices.” Submitted by California State University, Chico: David Zeichick

**Local Partnerships:** “Guiding Girl Scouts through a Computer Science Journey.” Submitted by Gulf Coast State College: Guy Garrett

**Student Learning Aid:** “Comic-BEE: Branching, Interactive Web Comics for Cybersecurity Education and Assessment for Learners of All Ages and Levels.” Submitted by Secure Decisions: Laurin Buchanan

View the full 2018 Innovations in Cybersecurity Education booklet: www.nationalcyberwatch.org/innovations
MARKETING AND COMMUNICATIONS

NCC’s marketing and communication efforts continue to be one of its signature services. Highlights include:

- High quality publication and graphic design
- Integrated marketing and communications tied to specific NCC program goals
- Full complement of services: social media, branding, publication and graphic design, media releases, copywriting, monthly e-Newsletter design and dissemination, e-blasts
- Expertise in the latest marketing and communication trends
- Easy distribution of content across the NCC’s various social media platforms
- Tracking, reporting, and usage of these systems

“The “Holiday Hacks” e-mail blast is just wonderful! It is engaging, clever, well-timed -- and it’s a brilliant way to highlight the Innovations in Cybersecurity Education winners.”

Dr. Corby Hovis
Lead Program Director
Directorate for Education and Human Resources
National Science Foundation
MEMBERSHIP

NCC members continue to play a unique and powerful role in shaping cybersecurity education, workforce development, and emerging issues in research, assessment, and evaluation. NCC provides varied opportunities for members to engage directly with NCC’s staff, programs and events, as well as with established and emerging leaders in Information Security.

MID-ATLANTIC COLLEGIATE CYBER DEFENSE COMPETITION (MACCDC)

The MACCDC, now in its 14th year, consists of both virtual qualifying rounds and a face-to-face final round engaging full-time undergraduate and graduate degree-seeking students, representing four-year universities and community colleges from Delaware, the District of Columbia, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia. In the past 14 years, over 2,300 students have participated in the MACCDC.

2018 MACCDC Scenario: “Breaking News”

A major online news service, the SWoRN Chronicle, has recently been the target of a group of Hackistanian hackers who appear to want to disrupt the reliable and credible reporting that sets the Chronicle apart from other news organizations. The ability of these insurgents to generate fake news in order to sway public opinion has been well documented. They use a variety of methods and are currently exploiting and infiltrating SWoRN Chronicle systems. Evidence has included the insertion of malware, bogus news stories, and complete hijacking of systems.

2018 MACCDC Dates:

- Virtual Regional Qualifiers: Feb. 1 & 7, 2018: 30 teams
- Face-to-Face Regional Finals: March 15-17, 2018: 8 teams
- National CCDC: April 13-15, 2018 (Orlando, FL): 10 teams

2018 MACCDC Final Regional Standings:

1. University of Virginia
2. Uni. of Maryland, Baltimore County
3. Wilmington University

The winner of the 2018 MACCDC, The University of Virginia, went on to win the National CCDC in Orlando, Florida. This is the second year in a row that a team from the Mid-Atlantic region has won the National CCDC (the University of Maryland, Baltimore County won the 2017 National CCDC).
NATIONAL CURRICULUM

NCC continues to develop and promote its reference curriculum degrees and certificate programs in Cyber Defense, Network Security Administration, Network Forensics, Secure Software Development, and Systems Security Administration, as well as work with academic institutions to implement new programs, or update existing ones.

To view the range of curricular offerings and benefits of adopting this content in both educational and training programs, see National CyberWatch’s Information Security Curricula Guide: A Complete Solution for Higher Education Institutions:

nationalcyberwatch.org/resource/curriculum-guide

VIRTUAL BROWN BAG LUNCH SERIES

The Virtual Brown Bag Lunch Series is aligned with the mission of the Cybersecurity Skill Journal, and in support of the NCC Foundation Series Competency-based Mastery Learning Curriculum. Its goals are to highlight inventions and innovations in cybersecurity competency-based mastery learning. A total of 12 VBBL’s have been produced as of this writing. Each VBBL is recorded and uploaded to the NCC YouTube channel and website for follow on promotion and retrieval.
National Cyber League (NCL)

Now in its eighth year, the NCL is a defensive and offensive puzzle-based Capture-the-Flag (CTF) cybersecurity competition. Its virtual training ground helps high school and college students prepare and test themselves for cybersecurity challenges that they will face in the workforce. All participants play the games simultaneously as both individuals and in teams.

Again - thank you for all you do - Your work and NCL is a blessing to our profession and helps to create the next generation of cyber warriors.”

Jim Furstenberg
Assistant Professor,
Information Security and Intelligence
Ferris State University
NATIONAL CYBERSECURITY STUDENT ASSOCIATION

With a focus on growing Student Chapters and forging industry and professional association partnerships, the National Cybersecurity Student Association continues to fulfill on its vision of cultivating a national community that supports students in their cybersecurity endeavors through extracurricular activities, career opportunities, mentoring, and keeping them at the forefront of cybersecurity trends.

PARTNERSHIPS

NCC’s collaborative model is based on broad interaction with stakeholders from educational institutions, businesses, government entities, and professional organizations. New Partners include:

- Cyber & STEAM Global Innovation Alliance
- Institute of World Politics, Cyber Intelligence Initiative
- Splunk
- IBM
- Kaplan IT Training
- Practice Labs
- ISHPI Information Technologies, Inc.

DIVERSITY

NCC has ongoing partnerships with the following organizations committed to diversity in both academic and workforce settings:

- Cyber & STEAM Global Innovation Alliance
- International Consortium of Minority Cybersecurity Professionals (ICMCP)
- Institute for Women in Trades, Technology and Science (IWITTS)
- Women in Cybersecurity (WiCyS)
- Information System Security Association Security Interest Group
- Women in Security

“National CyberWatch shares our commitment to broadening participation of women in Cybersecurity and to that end has been an important partner to the Institute for Women in Trades, Technology & Science.”

- Donna Milgrim
  Executive Director, IWITTS
WEBCAST SERIES

The Webcast Series, now in its fifth year, promotes the transfer of innovative, cost-effective and sustainable cybersecurity education and workforce development solutions. NCC ran six webcasts in 2018, focusing on a range of topics.

All webcasts were recorded and made available on the NCC website for further promotion and retrieval.
You’d be hard pressed to find a more experienced team working on information security education and workforce development in the world. A special thanks go to Barbara Belón, Bob Spear, and John Sener, who have been with the Center 14, 12, and 14 years respectively. Your contributions and lasting legacy will live on.

Dr. Barbara Belón  
Director, Member Services  
Director, Scholarship for Service Two-Year  
Belón Research & Practice  
Pennsylvania

Dr. Beth Hawthorne  
Senior Advisor  
Union County College  
New Jersey

Lewis Lightner  
Director, Operations & Programs  
Competition Director, MACCDC  
BrightPath Technology  
North Carolina

Dr. David Tobey  
Director, Research & Assessments  
Co-Principal Investigator  
Indiana University South Bend  
Indiana

Dr. Margaret Leary  
Senior Advisor  
Co-Principal Investigator  
Northern Virginia Community College  
Virginia

Dr. Costis Toregas  
Senior Advisor  
Director, Scholarship for Service Four-Year  
George Washington University  
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John Sener  
External Evaluator  
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Gus Hinojosa  
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National Cybersecurity Student Association  
Arizona

 Fran Melvin  
Director, Finance  
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Anita Shelton  
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Lynn Dohm  
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Dr. Bob Spear  
Senior Advisor  
Director, Community College Cyber Summit  
Prince George's Community College  
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Dr. Vera Zdravkovich  
Senior Advisor  
Prince George's Community College  
Maryland

Michael Burt  
Virtual Lab Manager  
Prince George's Community College  
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Casey W. O'Brien  
Executive Director & Principal Investigator  
Prince George's Community College  
Maryland

Dr. Vera Zdravkovich  
Senior Advisor  
Prince George's Community College  
Maryland
NATIONAL VISITING COMMITTEE (NVC)

Successful National Science Foundation applicants for large grants are required to appoint an NVC. These committees are groups of advisors that work with grantees and NSF to help them achieve their goals and objectives. They assess the plans and progress of the project and report to NSF and the project leadership. Committee members also provide advice to the project staff and may serve as advocates for effective projects.

In general, NVCs are similar to the advisory committees that are already an integral part of higher education institutions. In fact, most state and federally funded programs for these colleges require a local or regional advisory committee. However, there are differences between these committees and the NVCs. For example, local advisory committees report only to the project leadership who, in turn, set the meeting agendas. The NVCs not only report to the project, but also to NSF. Furthermore, NSF appoints the committee members, and the NVC chairperson plays a major role in setting the agenda.

Nicholas M. Cefaratti  
Information Security Systems Engineer  
Harris Corporation  
Florida

Dr. Philip Crager  
Associate Professor of Cybersecurity  
Department of Security Studies and International Affairs  
Embry-Riddle Aeronautical University  
Florida

Dr. Gaby Hawat  
NVC Chair  
Principal  
Catalyst Partners  
Florida

Dr. Corby Hovis  
Lead Program Director  
Directorate for Education and Human Resources  
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