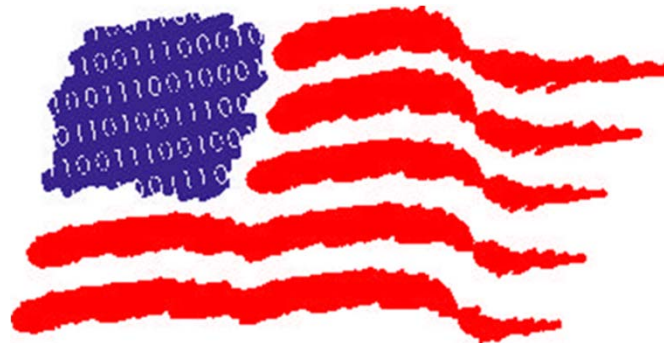


CyberCorps® Scholarship For Service (SFS)



Victor Piotrowski, Ph.D.
Lead Program Director
National Science Foundation



DIRECTORATE FOR EDUCATION
AND HUMAN RESOURCES

CyberCorps® SFS: Developing Cybersecurity Workforce for Government Organizations

Presentation Outline

- Twenty years of cybersecurity education and workforce development
- CyberCorps® SFS Program
- Serving the needs of FSLTT government organizations
- Identifying and attracting talent
- Broadening participation
- Challenges
- Q&A



NSF Mission



“To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...”



EHR invests in education research, development,
and workforce preparation.



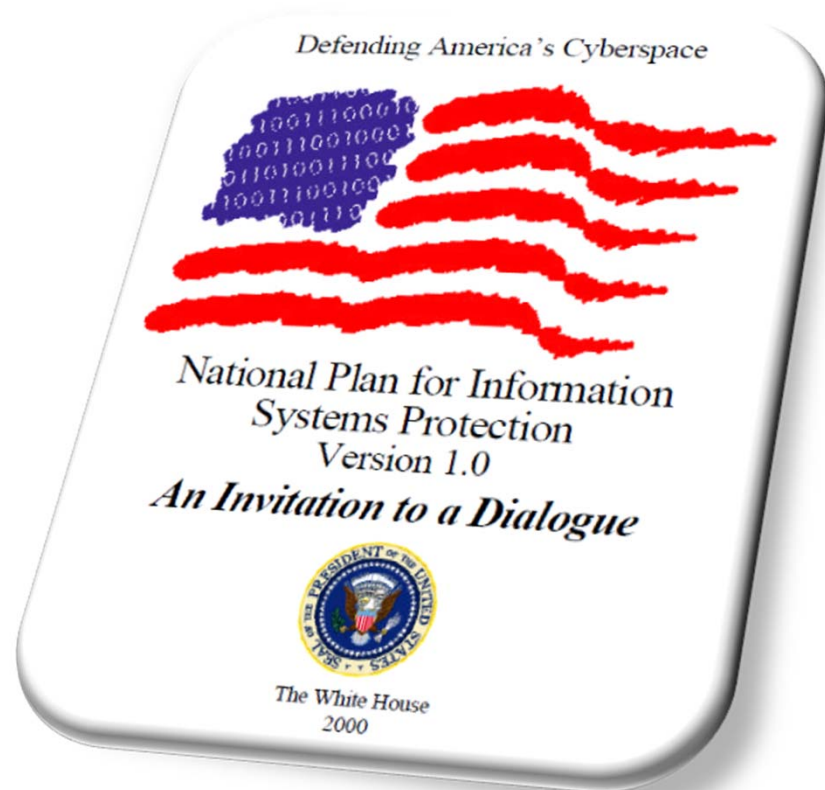
'90s bombings

- World Trade Center Bombing, 1993
- Oklahoma City Bombing, 1995
- Executive Order 13010 - Commission on Critical Infrastructure Protection (PCCIP) (July 1996)
- PCCIP Final Report (October 1997)
 - Public-private sector communication
 - Real-time attack warning capability
 - **Comprehensive education and awareness programs**
 - Legal structures for assurance
 - Research and development efforts
- Presidential Decision Directive 63, May 1998
 - **NSA Centers of Excellence 1998**
 - National Science Foundation CyberCorps **Scholarship for Service (SFS) Program 2000**



CyberCorps[®] Scholarship for Service (SFS)

- **Scholarship** grants support students earning degrees in cybersecurity in exchange for commitment to work for a federal, state, local, or tribal government agency after graduation.
- **Capacity Building** grants support innovative approaches to increase the ability of the U.S. higher education enterprise to produce cybersecurity professionals.



Cybersecurity Enhancement Act of 2014



Cybersecurity Enhancement Act of 2014

The Director of the National Science Foundation, in coordination with the Director of the Office of Personnel Management and Secretary of Homeland Security, shall continue a Federal cyber scholarship-for-service program to recruit and train the next generation of information technology professionals, industrial control system security professionals, and security managers to meet the needs of the cybersecurity mission for Federal, State, local, and tribal governments (...)

- provide scholarships through qualified institutions of higher education, including **community colleges** (...)
- provide the scholarship recipients with **summer internship opportunities** (...)
- **prioritize** the employment placement of scholarship recipients in the **Federal Government**.

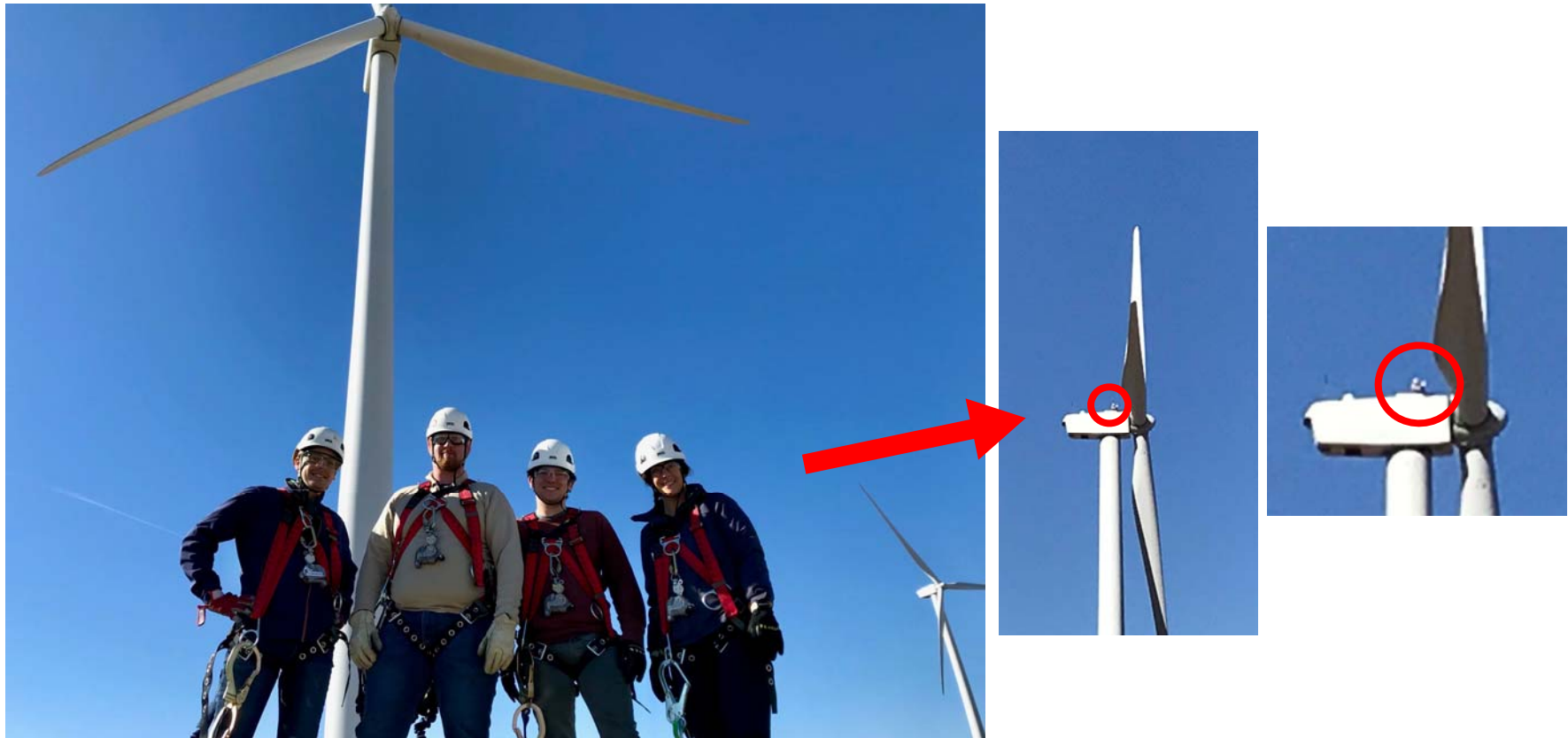


2018 National Defense Authorization Act

- Prioritize the employment placement of at least 80 percent of scholarship recipients in an executive agency (as defined in section 105 of title 5, United States Code)
- Develop and implement a pilot program at not more than 10, but at least 5, community colleges to provide scholarships to eligible students who (1) are pursuing associate degrees or specialized program certifications in the field of cybersecurity; and (2)(A) have bachelor's degrees; or (B) are veterans of the Armed Forces
- Provide awards to improve cybersecurity education at the kindergarten through grade 12 level— (A) to increase interest in cybersecurity careers; (B) to help students practice correct and safe online behavior and understand the foundational principles of cybersecurity; (C) to improve teaching methods for delivering cybersecurity content for kindergarten through grade 12 computer science curricula; and (D) to promote teacher recruitment in the field of cybersecurity



CyberCorps® Students – Protecting Critical Infrastructure



CyberCorps®: Scholarship for Service (SFS) Program

SUPPORT

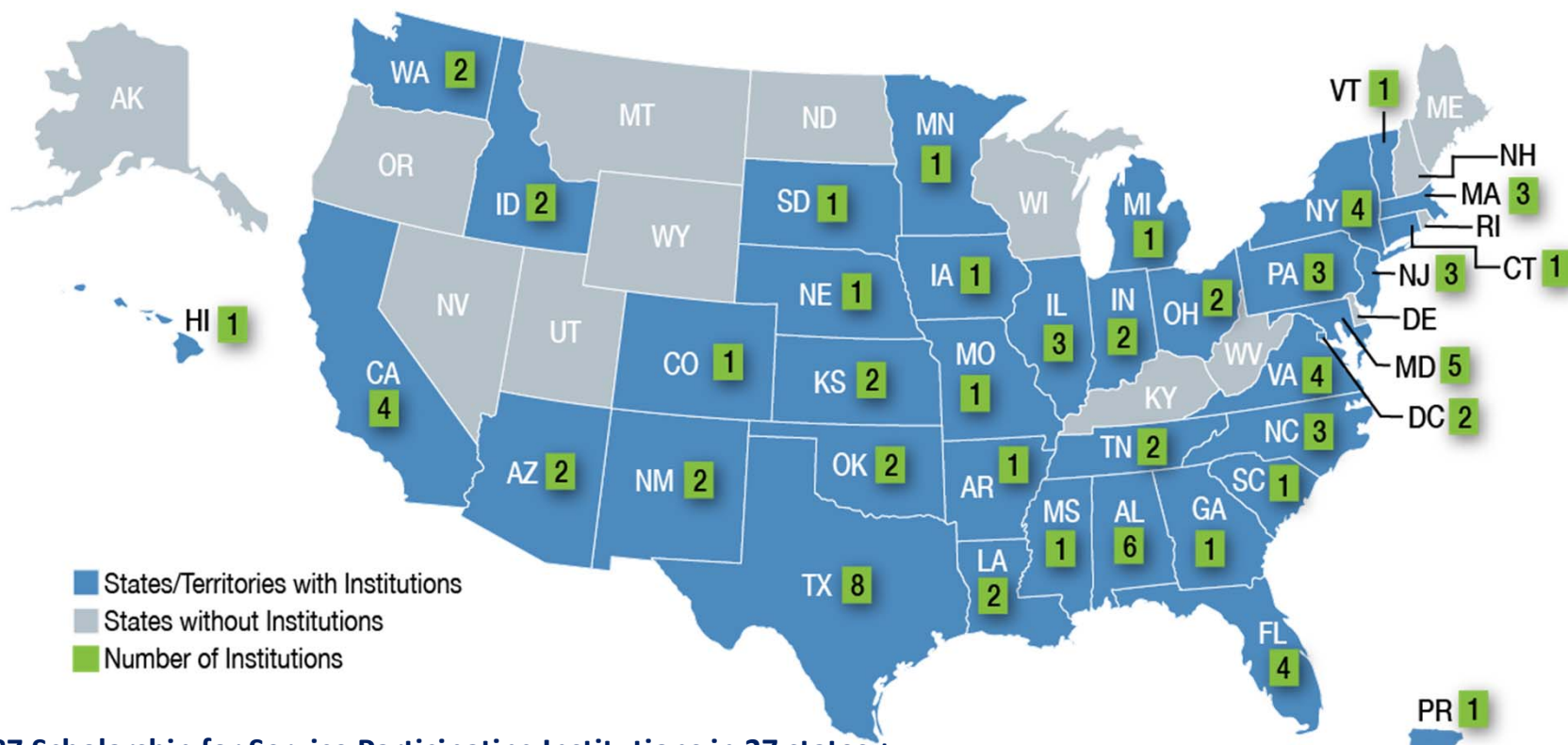
- **Funding:** full tuition plus stipends \$25K/\$34K and professional development \$6K per year, up to 3 years
- **Obligation:** Summer internship and post-graduation service requirement (work in a government agency for a period equal to the scholarship length)

IMPACT

- As of January 2020, **4,040** SFS scholarship recipients
- **2,834** entered government service
- Placed in **357** government organizations
- **800+** in the academic phase
- **340+** will graduate in May 2020
- B.S. (35%), M.S. (62%), Ph.D. (3%)
- Female (25%) (2013-2018)
- Placement rate **95%**



CyberCorps® SFS Academic Institutions



87 Scholarship for Service Participating Institutions in 37 states + District of Columbia and Commonwealth of Puerto Rico





CyberCorps® (SFS) Top Universities

Top 15 Universities by Student Enrollments 2013-2018	
University of Tulsa (OK)	95
Dakota State University (SD)	67
Carnegie Mellon University (PA)	59
Florida State University (FL)	58
Naval Postgraduate School (CA)	57
University of Maryland Baltimore County (MD)	56
California State University at San Bernardino (CA)	55
Mississippi State University (MS)	52
University of Alabama Huntsville (AL)	46
Northeastern University (MA)	45
U of Illinois at Urbana-Champaign (IL)	44
University of North Carolina (NC)	42
Towson University (MD)	38
University of Texas at Dallas (TX)	38
North Carolina A&T State University (NC)	37





CyberCorps® (SFS) Top Placements

Post-Graduation Agency	Number
National Security Agency (NSA)	600
Department of Navy	271
MITRE managed FFRDCs	225
State/Local/Tribal Government	191
Department of the Army	153
Department of Homeland Security	125
Sandia National Laboratories	123
Department of Defense	104
Department of Justice	81
John Hopkins Applied Physics Laboratory	76
Department of Air Force	74
Central Intelligence Agency (CIA)	66





CyberCorps® SFS Top Placements (cont.)

Post-Graduation Agency	Number
Lincoln National Laboratory	61
Software Engineering Institute (SEI)	58
Federal Reserve System/Federal Reserve Board of Governors	56
Department of Commerce	52
Federal Reserve Bank System	47
Department of Treasury	40
Government Accountability Office	38
Pacific Northwest National Laboratory	32
Los Alamos National Laboratory	31
Idaho National Engineering Laboratory	25
Department of State	25





CyberCorps® SFS Student Retention

- In Fall 2019, a survey was sent to 1,164 SFS students that have already completed their obligation.
- Of 403 individuals who responded to the survey, **65% stated that they are still working** in the SFS covered position (i.e. beyond the required period).
- The remaining 35% of the responders are now:
 - **working in a private sector (23%)**
 - continue working for the government as a **contractor (10%)**
 - are either **self-employed or not working (2%)**




<http://SFS.OPM.gov>





CyberCorps®: Scholarship for Service

About Us ▾ Become an SFS Student ▾ Current SFS Students ▾ Academia ▾ Agencies ▾

Designed to
INCREASE AND STRENGTHEN
the cadre of federal information assurance professionals that protect the
government's critical information infrastructure.

 **Students**

 **Academia**

 **Agencies**

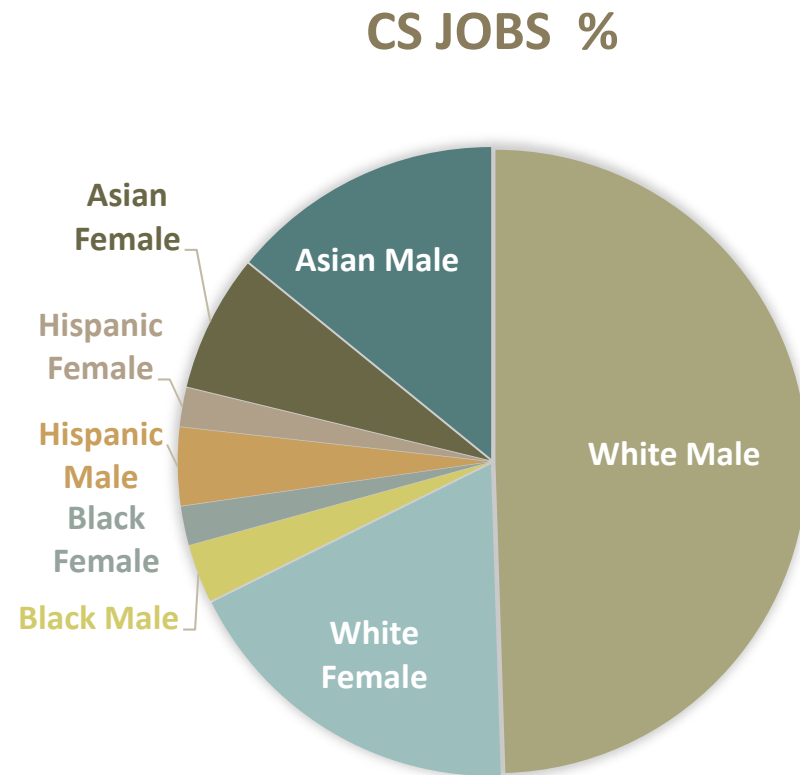
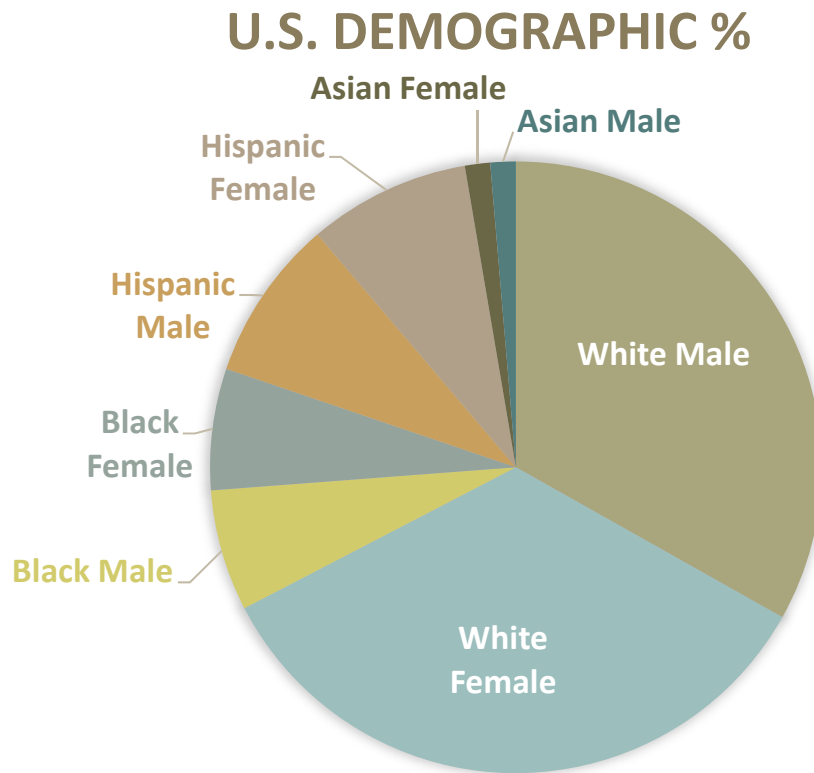
Start your cybersecurity career with the U.S. government

Scholarship For Service (SFS) is a unique program designed to recruit and train the next generation of information technology professionals, industrial control system security professionals, and security managers to meet the needs of the cybersecurity mission for Federal, State, local, and tribal governments. This program provides scholarships for up to 3 years of support for cybersecurity undergraduate and graduate (MS or PhD) education. The scholarships are funded through grants awarded by the National Science Foundation. In return for their scholarships, recipients must agree to work after graduation for the U.S. Government, in a position related to cybersecurity, for a period equal to the length of the scholarship.



DIRECTORATE FOR EDUCATION
AND HUMAN RESOURCES

Broadening Participation in Computing and Cybersecurity



CyberCorps® SFS Minority Serving Institutions

- University of Arizona – HSI
- Arizona State University – HSI
- Cal Tech Pomona – HSI
- CSU Sacramento – HSI
- CSU San Bernardino – HSI
- Florida International Univ. – HSI
- **Hampton University – HBCU**
- University of Illinois at Chicago - HSI
- New Mexico Tech– HSI
- **Norfolk State University – HBCU**
- **North Carolina A&T St. Univ. – HBCU**
- University of New Mexico – HSI
- Polytechnic Univ. of Puerto Rico – HSI
- Texas A&M University – HIS
- **Tuskegee University - HBCU**
- University of Texas at El Paso – HSI
- Univ. of Texas at San Antonio – HSI
- University of Houston – HIS
- University of Hawaii – ANNHI



National Capacity - WiCyS



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National Capacity - GenCyber



Summer 2018

- 150 GenCyber camps in 43 states, DC and PR
- 82 hosting institutions
- 4,123 students and 1,156 teachers participated
- female students - 48%; teachers - 68%
- ethnic/racial diversity of students – 44%; teachers – 32%



Employment of new North America **PhDs in Cybersecurity**

New PhD Employment	2018	2017	2016	2015	2014
TOTAL	114	120	106	76	83
Tenure Track Faculty	14	14	11	8	4

(Source: Taulbee Survey by Computing Research Association)



FY 2020-21 Activities

- Continue efforts to address shortage of faculty with cybersecurity expertise (Faculty Fellows)
- Building educational capacity and curricular recommendations for AI in Cybersecurity and Cybersecurity and Privacy of AI
- Support collaboration among 4-year, 2-year, and K-12 institutions to expand and sustain pipelines
- Continue investment in broadening participation projects



Contact Information

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Information for students and hiring officials:

<http://sfs.opm.gov>

Information for universities to apply for Cybersecurity Education grants:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504991

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504709

