Creating a Model Cybersecurity Eco-System in Western Pennsylvania to Strengthen the National Cyber Workforce

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1. University & PI Backgrounds

Indiana University of Pennsylvania

- Part of the PA State System of Higher Education (PASSHE) and one of the first schools to be designated by the NSA as a National Center of Academic Excellence.

- IUP Institute for Cybersecurity (ICS) is the entity responsible for coordinating all cybersecurity education and research activities. Since its establishment in 2005, the ICS has been awarded over $11M in federal funding for over 25 programs and initiatives since 2012, with an additional $7M expected through AY 2027-28.

Dr. Waleed Farag

- Professor of Computer Science at IUP and director of the ICS since 2012, securing over $11M in federal funds to support research and the work of the ICS.

- Founder and current PI of several major initiatives that contribute to the enhancement of cybersecurity research and education across the region.

IUP GenCyber Program Overview

- IUP offered the first NSF/NSA-sponsored GenCyber Program in PA in 2016 and has held a program for middle and high school students and teachers each year since then.

- Each program consists of a five-day summer camp focused on teaching important cybersecurity topics through innovative and hands-on activities.

IUP GenCyber Program Goals

- Increase awareness of cybersecurity content and encourage students to consider entering the cybersecurity workforce.

- Increase student diversity in cybersecurity at the K-12 level.

- Facilitate teacher readiness to learn, develop, and deliver cybersecurity content.

GenCyber Program Advantages

- Completely free for all participants.

- Participation award provided to participants:

  - Previous student awards included Raspberry Pi 4 Kits, Arduino Starter Kits, Sphero Ollie Robots, Parrot Cargo Drones, and Droid Inventor Kits.

IUP GenCyber Summer Program Statistics (2016-Present)

550+ students and teachers trained over **10** summer programs.

730+ total applications recieved, with **28%** from female applicants.

Applicants represent **180+** school districts across **20** different states.

Overview: DoD CySP Capacity Building Project

In conjunction with the 2019 Cyber Scholarship Program, IUP received funding from the DoD to host cybersecurity skill building workshops at local community colleges.

- **12** workshops were offered between 2019 and 2021, with **120** participants from six local community and technical colleges.

Workshop Curriculum

Each day-long workshop was offered on a Saturday and provided hands-on activities covering:

- Agile and Scrum methodology.
- Addressing cybersecurity threats, vulnerabilities, and attacks.
- Defense strategies against dark hat hackers.

Proudly sponsored by the DoD, IUP and BC3

CYBERSECURITY WORKSHOP

April 10 & 17, 2021

Planned Activities

- Introduction to the CySP Program
- Hands-on activities using the Raspberry PI
- Guest speaker presentations by security experts
- Hands-on session on Social Engineering & Steganography
- Hands-on activities on Network Traffic Analysis

Workshop Details

9:00 a.m. to 3:00 p.m each Saturday

Held Virtually via Zoom

Please visit
www.iup.edu/dodscholarship
for more information

- Space is limited, please act now!
- Open to all interested students and faculty.

REGISTRATION INFORMATION

Email sherri.mack@bc3.edu

PARTICIPATION ADVANTAGES

- Student participants receive a Raspberry Pi 4 Starter Kit with Fan Cooled Case
- Faculty participants receive a $500 stipend

Workshop Details

- Community/Technical Colleges included:
  - Butler County Community College
  - Laurel Business and Technical Institutes
  - Northampton Community College
  - Penn Highlands Community College
  - Westmoreland County Community College
- Workshop presentations provided by representatives from The College of New Jersey, CyberSN, and Uber.
- Originally planned for in-person, 8 of the workshops were offered on Zoom due to the pandemic.

4. IUP DoD Cyber Scholarship (CySP) Program

Program Overview

- Funded by the DoD, the CySP provides scholarships to high-achieving undergraduate and graduate cybersecurity students enrolled at NCAE-C institutions.

- While enrolled, students complete a paid internship at a DoD agency, and are hired as employees upon graduation.

IUP CySP Benefits

- Full tuition, books, and fees for up to two years.

- $29,000 stipend to cover living expenses.

- One-time laptop/computer purchase.

- Research opportunities with Department faculty.

DEPARTMENT OF DEFENSE

CYBER SCHOLARSHIP

ADVANTAGES
- Full cost of tuition and ALL fees provided for 2024 - 2025 academic year.
- A $29,000 (undergraduate) or $34,000 (graduate) stipend for room and board.
- The cost of all required books.
- One-time laptop/computer purchase.

BASIC REQUIREMENTS
- Minimum cumulative GPA of 3.2 (undergraduate) or 3.5 (graduate).
- Must be entering junior or senior year or a graduate program in Fall 2024.
- Must be a U.S. Citizen.
- Agree to work for the DoD as a civilian for one year for each year of scholarship received.

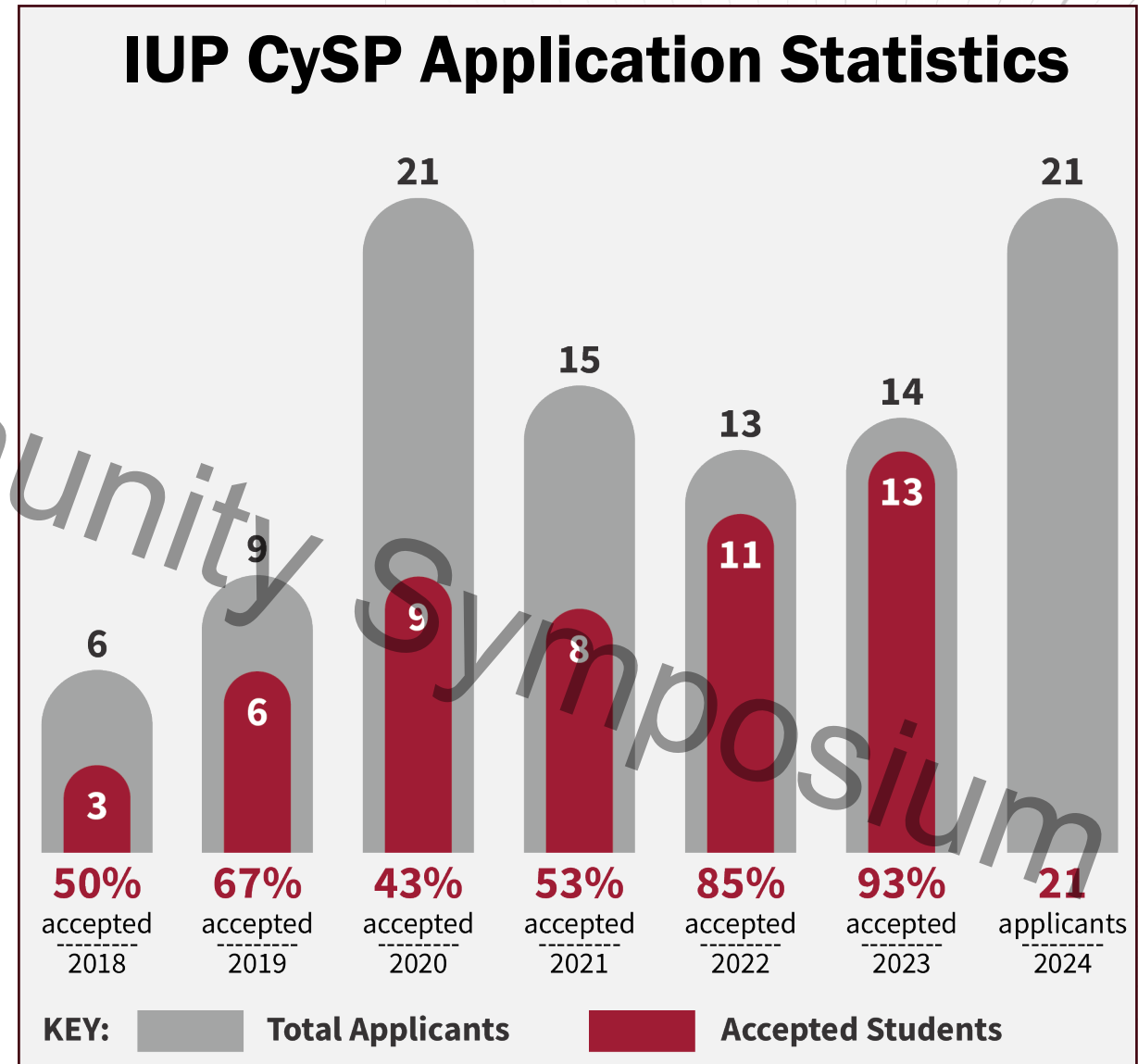**INFORMATION MEETING:** November 20, 2023 at 11:15 am (zoom)

Visit www.iup.edu/dodscholarship for detailed information and instructions on how to apply.
Send questions to the Program Director, Dr. Farag, at farag@iup.edu

Awardee Mentorship Program

- Each CySP recipient is mentored by IUP Computer Science faculty and staff throughout the academic year.

- Monthly meetings are held with all recipients to discuss academic progress and challenges, current and upcoming research opportunities, and provide support to ensure degree completion.

- Meeting documents for each CySP award year can be found on the program website at www.iup.edu/DoDScholarship.

IUP CySP Application Statistics

Year	Total Applicants	Accepted Students	Accepted %
2018	6	3	50% accepted
2019	9	6	67% accepted
2020	21	9	43% accepted
2021	13	8	53% accepted
2022	13	11	85% accepted
2023	14	13	93% accepted
2024	21		21 applicants

KEY: Total Applicants — Accepted Students

5. PA Comm. College Consortium Coop. Agreement (PC4A)

PC4A Program Overview

In AY 2022-23, IUP was awarded almost **$5 million** to establish a cybersecurity consortium with six community colleges across PA to strengthen the cybersecurity workforce in our country. The PC4A Project will continue through August 2025, with a possible extension to August 2028 and an **additional $6 million** in funding.

PC4A Program Objectives

Increase Certification Attainment Rates

HOW: Host certification preparation workshops, award free exam vouchers, offer hands-on labs, and promote career benefits of industry related certifications.

Increase Transfers to Four-Year Institutions

HOW: Establish program-to-program transfer agreements between community college partners and local four-year institutions.

Increase Interest in DoD/DIB Employment

HOW: Cultivate and strengthen relationships with DoD/DIB entities, provide paid internship opportunities, train faculty on contemporary topics, and promote employment opportunities.

Through PC4A, smaller cybersecurity eco-systems are being created across the state of Pennsylvania as partners work to reach project objectives.

Eco-System Establishing Initiatives

- Launch of new internship programs at government agencies and private companies.

- Design and offering of cybersecurity community events geared toward K-12 students and the public.

- Enhanced collaboration between partners and IUP through scholarship programs, partner conferences, and faculty development workshops.

- Sponsorship and support of STEM focused events.

5. PC4A Accomplishments

15 certification prep workshops held

174 tuition and book scholarships awarded

716 vouchers for free lab and textbook access provided

128 student participants in cert-prep workshops

27 paid internships offered at 25 different companies/agencies

1,650 internship hours completed

65 free certification exam vouchers awarded

1,272 hours of free tutoring provided

15 STEM courses added or updated in degree programs

19 DoD approved certs earned by students

12 faculty training events hosted or attended

39 STEM faculty trained in cybersecurity topics

50 events hosted or attended by partners

63 connections made with government, academic, and private entities

32 bi-weekly meetings held with partners

NCAE-C PhD Scholarship Program

In AY 2022-23, IUP received funding from NCAE to support a PhD candidate seeking a doctoral degree in cybersecurity. The scholarship recipient received full tuition and fees, a $35,000 annual stipend, and cost of books up to $1,000 for two academic years.

Annual Cybersecurity Days

Since 2008, IUP has hosted a public event for students, faculty, and members of the community to learn cybersecurity topics from experts in the field.

1,600+
Est. Participants

Guest speakers represent:
19 private companies
12 government agencies
6 colleges/universities

Student-Centered Events

- IUP students regularly participate in competitions against other colleges and intuitions, including the NCAE-CE Regional Hackathon and Bloomsburg University of Pennsylvania annual BloomCon.

K-12 Outreach

- IUP Computer Science faculty regularly collaborate with local K-12 institutions through classroom visits, career fairs, and participation in advisory boards.

6. Additional Eco-System Supporting Initiatives

Government Collaborations

- IUP has collaborated with representatives from many government agencies including NAVSUP, the US Dept. of State, and the White House Office of National Cyber Director to address important cybersecurity workforce challenges, initiatives, and best-practices.

7. Lessons Learned

1 Leverage Relationships

Relationships established through previous projects and activities have allowed for the expansion of IUP's eco-system.

2 Start with K-12

Programs like IUP GenCyber allow for additional collaboration with K-12 faculty and help provide a pipeline of students into other programs like the DoD CySP and PC4A.

3 Strategically Communicate

Through years of outreach, events, and activities, the IUP ICS has established a vast network of collaborators. Mailing lists are maintained to communicate opportunities for collaboration.

4 Maintain a Web Presence

The IUP ICS established many dedicated web pages within the IUP website which are invaluable for advertising programs, sharing resources, or providing contact information for those outside of our already established network.

- Outreach events, collaborations, and federally funded programs have all contributed to the establishment of a cybersecurity eco-system in western PA and beyond.

- Programs like IUP GenCyber, PC4A, and the IUP DoD CySP allow for engagement with students in middle through graduate school.

Questions?

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www.iup.edu/cybersecurity

www.pc4a.org