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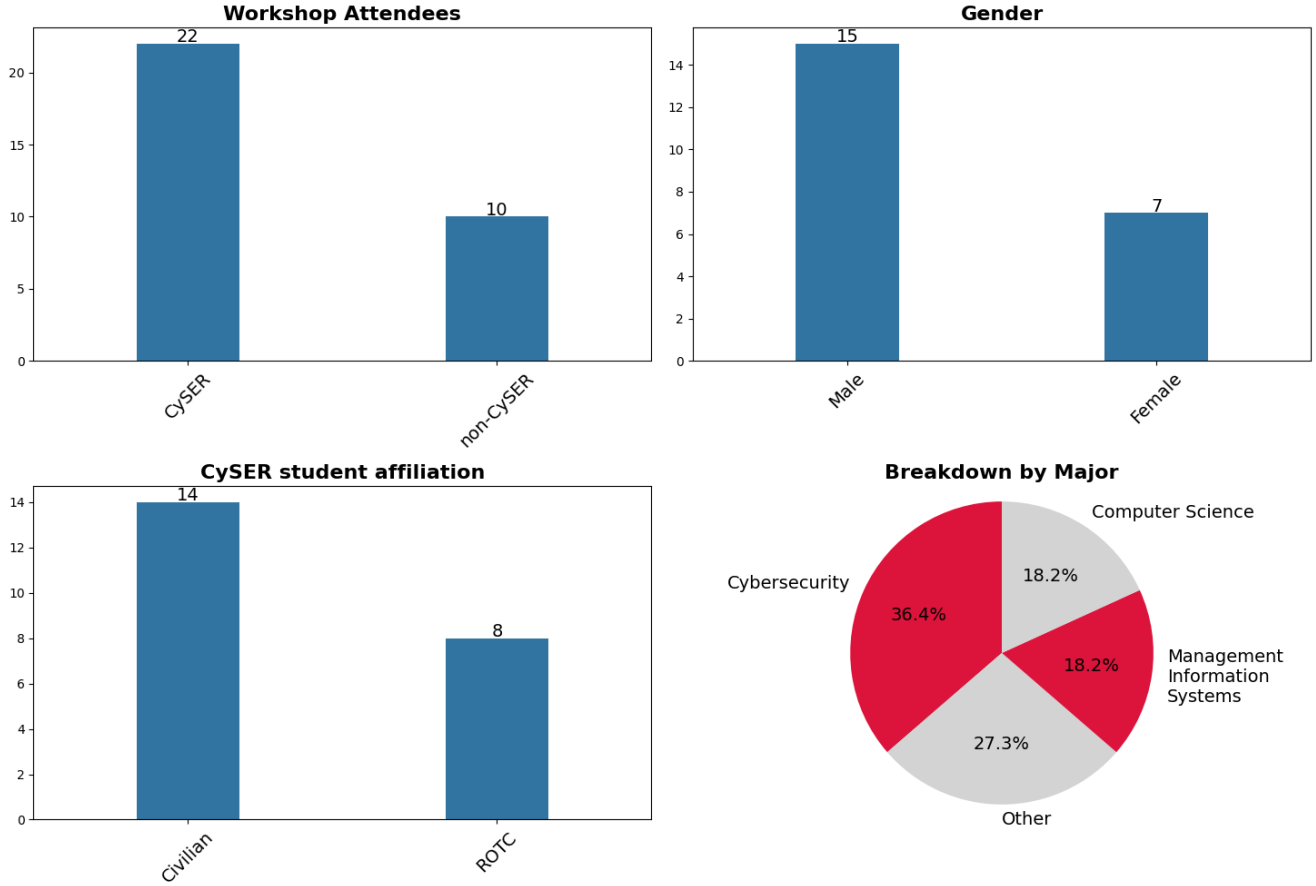
Ten Takeaways from the VICEROY CySER Summer Workshop 2025

By Assefaw Gebremedhin and James Crabb

Introduction

The VICEROY Northwest Institute for Cybersecurity Education and Research (CySER) led by Washington State University (WSU) holds a workshop each summer for its undergraduate participants. In its fourth edition this year, the VICEROY CySER Summer Workshop 2025 was held over the week of May 19 to May 23, 2025, at WSU in Pullman, WA. The workshop featured a wide variety of presentations, tutorials, and hands-on experiential learning activities on a broad range of cybersecurity topics. The workshop also featured an industry panel answering questions from students about careers in cybersecurity, and two field trips: a half-day trip to Schweitzer Engineering Laboratories (SEL) power grid components factory in Pullman, and a half-day trip to SEL's printed circuit board factory in Moscow, ID. The workshop was attended by twenty-two VICEROY CySER students and ten guest participants including faculty, graduate students, and incoming freshmen. In total, the workshop featured twenty-four speakers and panelists (besides the organizers) from eleven different organizations.

In this article, we share ten key takeaways from the workshop from our point of view as the workshop's organizers that we believe the Military Cyber Professionals Association (MCPA) community and readers broadly will find useful in organizing similar events.



Participant metrics for the CySER Summer Workshop 2025.
Gender, ROTC status, and majors are displayed for CySER students who attended the workshop only.

Keynote Address Set the Tone for the Workshop

Chester "CJ" Maciag, VICEROY National Director and lead of Cyber-Spectrum Academic Outreach at the Office of the Undersecretary of Defense for Research and Engineering (OUSD R&E), delivered the workshop's keynote address. As one of the pioneers in the creation of the VICEROY program and its ongoing operation, Mr. Maciag is uniquely qualified to speak about the purpose of the program.

This set the tone for the workshop and contextualized the broader mission of the VICEROY program, which is to "Establish academic cyber institutes at institutions of higher learning, to develop foundational expertise in critical cyber and spectrum operational skills for future military and civilian leaders of the Armed Forces and the DoD, including such leaders of the reserve components." CySER is one such cyber institute and contributes to the broader mission by providing curricular as well as extracurricular cyber training to its students through such activities as the summer workshop.

Field Trips Take the Workshop Further

Each summer workshop that CySER has held included multiple field trips. In the past, these included destinations such as the Pacific Northwest National Laboratory and Fairchild Air Force Base. This year, students saw firsthand the facilities at Schweitzer Engineering Laboratories' (SEL) Pullman, WA and Moscow, ID campuses, which produce power grid components and printed circuit boards, respectively. Students also spoke with a panel of four cybersecurity specialists that work at SEL about their roles there.

Field trips provide a major benefit to students by immersing them in an environment where the topics they are studying, in this case cybersecurity, are applied every day. Students interact with people working in that field, ask them questions and hear their advice and stories. They also see actual workspaces as well as hardware and equipment that is involved. Together, these experiences can help students decide what specific roles they might be interested in within a broader professional field or even help students understand abstract concepts they may have been exposed to in their classes by providing real-world examples and applications of those concepts.

Industry Panel Channels Experience and Wisdom

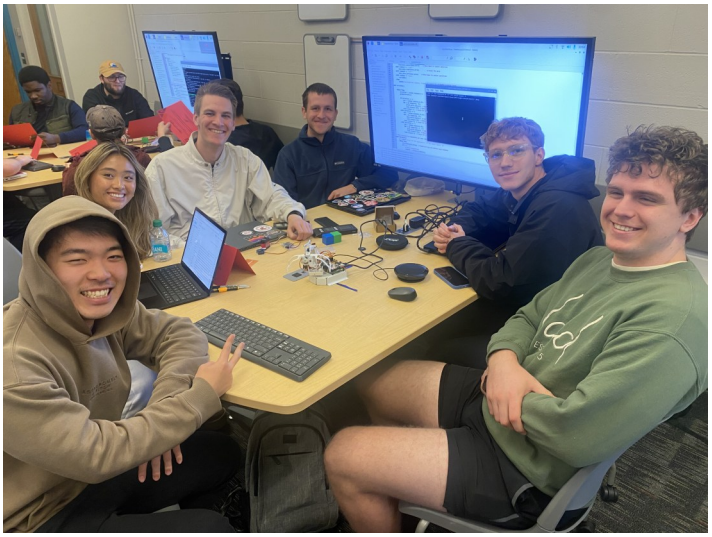
The final day of the workshop featured an industry panel with five cybersecurity practitioners from across industry and government. The panelists were from the Air Force Research Laboratory (AFRL) Information Directorate, Pacific Northwest National Laboratory (PNNL), Google, Schweitzer Engineering Laboratories (SEL), and the Cybersecurity and Infrastructure Security Agency (CISA). Collectively, the panelists brought around a century's worth of experience in the cybersecurity field. They put that deep wealth of experience to effective use in answering students' questions related to cybersecurity careers. The main goal here is to motivate students by helping them understand what their own roles and responsibilities could look like, and to help get them started leaning on the advice of industry veterans.

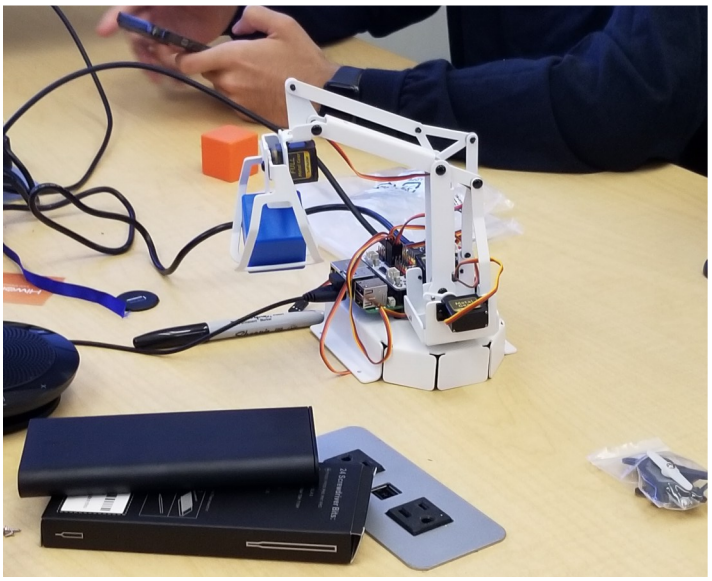
CySER Summer Workshop 2025 students and staff at SEL's printed circuit board factory.

Hands-on Experiential Learning

We include hands-on demonstrations in our workshops to give students the opportunity to actively engage in cybersecurity lessons and learn by doing. This year we had two hands-on demos. The first taught students about cyber-physical systems security by having students write code to control and then hack a small robotic arm. This was particularly immersive because the students could see the direct effects of their benign and malicious code on the actions of the robotic arm.

The second hands-on demo taught students about digital forensics by having them use real-world tools to examine digital files. This activity was additionally framed as a capture-the-flag challenge, with teams of students being awarded small, fun prizes for finding the flags hidden in the digital files.





Students participating in the cyber-physical systems security hands-on demonstration during the CySER Summer Workshop 2025.

Broad Set of Participating Organizations

Cybersecurity is an incredibly diverse field in terms of the broad array of jobs it encompasses. As such, we try to include as many different organizations in the workshop as possible from across academia, government, and industry to make our students aware of a variety of different cybersecurity career pathways and focus areas. From academia, this year's workshop included speakers from Washington State University, Montana State University, Oregon State University, and Tennessee Technical University. WSU and MSU are members of the VICEROY CySER institute, whereas OSU and TTU were engaged from outside of the consortium. Workshop speakers and panelists from government included OUSD R&E, AFRL, Naval Undersea Warfare Center Keyport, PNNL, and CISA. Industry contributors included SEL and Google.

Wide Range of Topics Covered

As diverse as the cybersecurity field is, we do our best to include a variety of topics that are both timely and impactful. This year's workshop included presentations on the following cybersecurity topics, delivered by nationally renowned subject matter expert speakers:

- Cyber-physical systems security
- Digital forensics
- Image privacy
- Vulnerability and attack pattern mapping
- Large Language Models and AI security
- Quantum computing
- Cybersecurity education in the U.S.
- Software contracts for verification
- Cybersecurity incident response strategy
- Web security and privacy
- Digital repression
- Security of time series machine learning
- Post-quantum cryptography
- Professional development in cybersecurity

Professional and Career Advice

Additionally, given VICEROY's mission to enhance the cybersecurity talent pipeline and development, we include events discussed throughout this article such as the field trips, industry panel, and research showcase to help students develop professional and "soft" skills that are often cited as being in high demand across all cybersecurity jobs.

To that effect, we include talks and events aimed at helping students find relevant jobs that are interesting to them. In addition to the industry panel and field trips, one of our speakers, a career services director, gave a talk on

how to make the most of an internship through intentional actions taken before, during, and after the internship. And as any cybersecurity professional knows, the field is constantly evolving and requires them to continue learning about emerging topics in cybersecurity. In line with this, one of the talks during the workshop was on how to be a lifelong learner, delivered by an education professor with research expertise on the subject.

Student Research Showcase

Over the course of at least one of their semesters in the CySER program, students participate in a mentored research project led by graduate students, faculty advisors, and sometimes even other CySER students who have completed the program and are now seniors. The goal is to have students work in groups to learn a specific cybersecurity topic more deeply while at the same time showing them what the research side of the cybersecurity world looks like.

Each group creates a poster showcasing their project, the work they did, and any results that came out of it. These posters are then presented during the summer workshop to their fellow CySER participants, faculty, and graduate students. On top of the research itself, this gives students a chance to develop their written and oral communication skills and to discuss their work with peers.

CySER students discuss their mentored research projects with other students and faculty at the CySER Summer Workshop 2025.

"It Takes a Village"

There is a lot of organization and planning that goes into a week-long event like this workshop, and a significant amount of support from staff not directly affiliated with the CySER program is required. Field trips need prior arrangement for vehicles and drivers, which for us means working with the university motor pool. Students not staying in Pullman through the summer need housing, which requires help from another university office to arrange. Providing snacks and refreshments requires arranging for catering or having someone to go purchase food and deliver it. All the above require paperwork for approving and purchasing them and administrative staff to process it. Beyond our own time and effort, there are significant institutional resources that go into making such a workshop possible.

Enthusiasm of Participants

This being the fourth iteration of the CySER Summer Workshop means that it is well-known among past participants, both students and speakers. Organizations such as CISA, PNNL, and SEL who have worked with us on past workshops have formed strong partnerships with CySER, resulting in their perennial involvement. Many of the people we invited to speak this year had participated in previous workshops, and all the new speakers were professional colleagues that we knew through the organizations listed above or through other cybersecurity-related programs.

Nearly every single one of the speakers we invited responded quickly and enthusiastically, reflecting a high regard for the workshop; we attribute this to the partnerships we have formed with them over the past several years and a shared goal of contributing to national workforce development. Both the dean of the college and director of the school that houses CySER took the time to give opening remarks on the first day of the workshop. The field trips to SEL were arranged by their Lead University Relations Partner and included four panelists, as discussed above, as well as three guides at the Pullman site and two guides at the Moscow site; together, these represent a significant time investment on the part of SEL. Similarly, three speakers from PNNL, a bit over two and a half hours away, drove to the workshop and gave their talks in person. Establishing relationships like these early on can make a huge difference in the success of an ongoing, annual workshop.

Conclusion

CySER's mission is to educate the next generation of military and national defense-aligned civilian workforce in cybersecurity. Our workshop is an integral part of that mission, and we would like to recognize the outstanding contributions of all our speakers, panelists, and field trip hosts and the strong institutional support. We also recognize the active participation and commitment of workshop attendees. Recordings, materials, and photos from the workshop are publicly available on the CySER website.

Dr. Assefaw Gebremedhin (assefaw.gebremedhin@wsu.edu) is the Lead PI and Director for the VICEROY Northwest Institute for Cybersecurity Education and Research, and currently an associate professor with the School of Electrical Engineering and Computer Science at Washington State University, where he leads the Scalable Algorithms for Data Science Laboratory. He earned the MSc and PhD degrees in computer science from the University of Bergen, Norway. His research interests include data science, AI, network science, and cybersecurity. He also directs a CyberCorps Scholarship for Service (SFS) program at WSU and a Department of Education-funded Graduate Assistance in Areas of National Need (GAANN) program at WSU focused on training PhD students in AI for engineering applications.

Dr. James Crabb (jamescrabb@wsu.edu) is the Program Coordinator for the VICEROY Northwest Institute for Cybersecurity Education and Research. He originally studied horticulture, earning Bachelor's and Doctorate degrees in Horticulture from Washington State University. During his previous graduate studies, James recognized the importance of computer science to all other scientific domains, leading him to earn a second bachelor's degree, this time in computer science. This was followed by a master's degree in computer science again at Washington State University, with a focus on cybersecurity and data science.
