CAL POLY

California Cybersecurity Institute

LEARN BY DOING

ANNUAL REPORT

2023-24

OVERVIEW

The following report follows the reporting criteria as required by Cal Poly for approved Campus Centers and Institutes with Academic Affiliation (Academic Senate, March 11, 2014). This report delves into the state of cybersecurity in California, summarizes the institute's activities for the year, provides financial activity, and illustrates how the institute supports faculty and students.

The California Cybersecurity Institute (CCI) brings academic and private sector know-how to bear on today's pressing cybersecurity challenges, including workforce development and applied research.

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California Cybersecurity Institute Annual Report

BILL BRITTON

Special Advisor to the President
Director, California Cybersecurity Institute

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INTRODUCTION

Message from Director William J. Britton

The Cal Poly California Cybersecurity Institute (CCI) is focused on a serious and growing workforce development problem by addressing the growing cybersecurity defense challenges facing our state. The future vision of the CCI is to create a world-class training and education facility dedicated to the complex and emerging cybersecurity challenges facing the United States, the State of California, and Cal Poly. Additionally, the CCI serves as a focal point for cybersecurity collaboration through strategic relationships with academia, government, and industry.

Through our work, CCI endeavors to build a skilled and innovative cyber workforce capable of navigating today's complex threat landscape. By training a new generation of cybersecurity experts in the latest tools and techniques, this initiative helps to safeguard California's data, computer systems, and critical infrastructure. We will accomplish this across three distinct work streams: **Train** to reskill, upskill, and build tech literacy across the State of California and communities around the country; **Accelerate** unique opportunities to advance the Cal Poly Learn by Doing pedagogy for students and faculty; **Empower** early education opportunities to build a pipeline for future students interested in careers in technology.

The impact of our work, regardless of where you are in the workforce, is beneficial. If you are coming to CCI as a secondary school educator or student, we have programs like our Space Grand Challenge that will help you understand the depth of opportunities available to you in cyberspace. Likewise, if you are seeking reskilling opportunities around IT or cyber, we have our Cyber Civics and ATP trainings that can help you start your journey into technology.

Our programs are supported by physical facilities, generously made available to us at Camp San Luis Obispo by the California Military Department and the California National Guard. Our facilities include an operations/training facility, and a cyber range suitable for hosting large-scale, immersive training events.

Our work is made possible because of the generosity of our supporters from around the country. Like us, they understand that building a future diverse, and day one ready workforce requires investments in institutions, like the CCI, allowing Cal Poly students to bring to life the experiences and knowledge from the classroom in a professional work setting. To learn more about how you can support our student assistants and our Learn by Doing activities, please visit our Support page.

Finally, I would be remiss if I did not mention the gratitude we have to the host of faculty and students that come to the CCI daily in support of our mission. They are the secret sauce that make everything possible.

I invite you to look through our website and to familiarize yourself with the breadth of our work. I also invite you to join our monthly Cyber/Space Newsletter to stay involved, as well as follow our social media accounts, where we bring the updates directly to you. We look forward to showing you more of what we do. Ride High, You Mustangs!

With gratitude,

Bill Britton
Special Advisor to the President
Director, California Cybersecurity Institute

MISSION

Executive Summary

The California Cybersecurity Institute (CCI) at California Polytechnic State University (Cal Poly) in San Luis Obispo, California, leads a state and national initiative to address cybersecurity challenges. By bringing together the tech community, government agencies, and educational institutions, the CCI is enhancing cybersecurity defense capabilities at Cal Poly for California and across the nation. We do this through our work focused on three pillars:

Train to reskill, upskill, and build tech literacy across the State of California and communities around the country.

Accelerate unique opportunities to advance the Cal Poly Learn by Doing pedagogy for students and faculty.

Empower early education opportunities to build a pipeline for future students interested in careers in technology.

ASI Chartered Purpose

Educating and empowering well-prepared, socially conscious, and career-ready students to be leaders.

Produce Security Cognizant Graduates: that ultimately create opportunities to ignite social change and create innovative, purposeful cybersecurity solutions no matter their field or work.

Enhance the Growth of the University: through increased research projects, increased desire for enrollment applications, and increased public and private partnerships through the creation of a center for security studies that will have the ability to boldly address a security issue but also transform all the people involved.

Core Values

The following core values guide the operations and management of the California Cybersecurity Institute:

Learn by Doing - Demonstrated by hands-on, student-centered, interdisciplinary education and an approach to continuous improvement in the fields of Cybersecurity.

Excellence - Demonstrated through a collegial community and industry partnerships that pursue responsive scholarship, innovation, leadership, and service.

Knowledge - Demonstrated by scientific integrity responsiveness to the security space, industry, and social needs through a dedication to fostering lifelong learning.

Student Success - Demonstrated by students who are prepared to contribute to the diverse needs of society.

Integrity - Demonstrated by the highest possible ethical standards and accountability for working in cybersecurity.

Passionate Professionalism - Demonstrated by respectful collaboration in collegial, industry, and government communities in the pursuit of excellence in teaching and learning, resulting in meaningful research and scholarship.

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Programs

CCI tracks programs in three distinct workflows: Train, Accelerate, and Empower.

TRAIN

CCI aims to continue to provide training to the public and private sectors to help upskill and reskill the workforce to prepare professionals for future careers.

Provided training reaches different audiences, ranging from IT professionals to law enforcement. The increased emphasis on digital literacy and cybersecurity awareness prepares the current and future workforce for advancing careers in technology.

CCI works with outside stakeholders to provide training to professionals as part of its workforce development efforts. Through a partnership grant with the State of California Department of Technology, CCI provided courses on cyber threat intelligence, ransomware response planning, and attack communication preparation for 116 state staff over the last year. Additionally, in collaboration with the State of California Office of Planning and Research and the CADENCE and CASCADE programs, CCI provided students from multiple institutions around California with IT and security training.

ACCELERATE

The CCI works on providing unique opportunities to advance the Cal Poly Learn by Doing pedagogy for students and faculty.

During the 2023-2024 fiscal year, 24 students were employed at the CCI as student assistants in various roles ranging from developers to communication specialists. Student assistants have the opportunity to work on programs and projects in partnership with professional staff. Some of the projects the student assistants worked on include:

- Space Grand Challenge Sandbox Series – October 2023
- Space Grand Challenge Annual Competition – April 2024
- Cyber/Space monthly newsletter
- Live stream event and partner interview production

Furthermore, CCI continues working internally and externally with partners to structure programs that grow student professionalism. Additional student opportunities included professional certifications and training for platforms like Splunk, AWS, Unity, and Fortinet.

Over the last year, CCI has continued to be a thought leader in cybersecurity. In addition to some of our past work, CCI has partnered with the California Advanced Defense Ecosystems & National Consortia Effort (CADENCE) and California Advanced Supply Chain Analysis and Diversification Effort (CASCADE). These initiatives work with a consortium of partners, examining the role of cybersecurity and space within California. Additional student and staff support for these grants was provided via Cal Poly's Digital Transformation Hub (DxHub) through digital transformation challenges, allowing for increased cross-

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collaboration and experiential learning for student staff, as profiled by the Markle Foundation.

Finally, CCI staff continue to support internal and external cybersecurity education and informational events on and off campus. This support has included external presentations to the National Initiative for Cybersecurity Education (NICE) and NICE K-12 Conferences, AWS conferences and events, DEFCON and RSA Cyber Conferences, presentations and collaboration sessions with Lawerence Livermore Lab, Vandenberg Space Force Base, and the Department of Education. Additionally, CCI hosted internal presentations and classes, the United States Space Force 65th Cybersecurity Squadron, Space Systems Command, and Vandenberg Digital Transformation Office, as well as events for Cal Poly alumni and continued partner support of the University's GenCyber program.

EMPOWER

CCI delivers foundational training to middle and high school students from across the globe through its game-based cyber education platform.

Over the last year, CCI continued its focus on empowering early education in cybersecurity through the Space Grand Challenge (SGC) virtual game-based cyber training platform. This cybersecurity program, designed for middle and high school students, involves a complex, fictional cybercrime written and developed by CCI staff and students. Participating teams work to investigate a satellite hacking cybercrime by solving intricate puzzles and challenges using various technical skills, digital forensics, and cybersecurity tools. Student assistants worked closely with a professional Technical Curriculum Developer to develop this competition.

In addition to providing a fun and interactive learning approach to cyber concepts for players, the SGC game platform provides experiential learning and development opportunities for CCI's student assistants. Engaging with staff, students learn AWS infrastructure development techniques while building the underlying game architecture, Unity-based gamified education strategies to support frontend interaction, and cybersecurity concepts to support challenge and puzzle creation. CCI students and players also gained new skills in 5G and private network-based cybersecurity strategies by including new game rooms during this last season.

In the spring of 2023, CCI expanded the number of SGC events to increase the operational reach. With the introduction of Sandbox events, players now have more opportunities to engage with the platform and incorporate practice sessions, as requested by participating schools. Over the last competition season, 750 players registered across 13 states for SGC events. This included 323 registered players for the October 2023 Sandbox event and 427 registrants for the annual competition in April 2024. Additional outreach and platform interactions are provided during national conferences, like DEFCON, RSA, and NICE K12, where educators can play demo games and learn more about CCI's educational mission.

The SGC annual competition, last held on April 27, 2024, continues to be broadcast and hosted live by CCI students (twitch.com/calpolycci), creating an additional platform for broad programmatic interaction. This year's broadcast included numerous interviews with cybersecurity luminaries, like Eric Escobar, from SecureWorks, Cal Poly educators, like Dr. Chris

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Lupo, Director of the Noyce School for Applied Computing, and partner companies, like Splunk and AWS. Run from the CCI's office at Camp San Luis Obispo, the event garnered in-person participation from the United States Space Force 65th Cybersecurity Squadron, whose Guardians interacted and met with CCI students to share their experience securing national space assets.

Additionally, the institute's SGC program garnered the attention of the Department of Education, which invited Cal Poly to participate in their Ed Games Expo in Washington D.C. during cyber awareness month in October 2023, and the Department of Commerce's NICE program, which aided in promoting the event. Finally, the CCI also gained support this year from new media partner SimplyCyber (simplycyber.io), run by Dr. Gerald Auger, who conducted live interviews and demos of SGC for a national YouTube audience of over 158,000 subscribers.

Grants

Several grants were successfully completed during the last fiscal year including CCI's consortium partnership CASCADE III grant for the Department of Defense, managed by the California Office of Planning and Research (OPR). This grant, which supported Cal Poly's cybersecurity workforce development efforts generated multiple opportunities for engagement with federal, state and private partners. The success of this grant has led OPR to continue collaboration with Cal Poly and partner organizations and seek future funding opportunities for the group.

During this period, CCI has extended multiple grants at the funder's request, including the training program with the California Department of Technology (CDT) and the Woody Biomass Remediation development project with OPR. Also, CCI has applied for additional funds to support research efforts around the Paso Robles Spaceport initiative and regional cyber awareness and workforce development.

Project Name	Sponsor	Total Fund Amount	Grant Start Date	Grant End Date
Social Impacts of AI & Adv Tech	New Venture Fund	$89,614.00	1/1/23	4/30/24
Advancement Officer	WILLIAM AND FLORA HEWLETT FOUNDATION	$600,000.00	5/1/21	5/1/25
CyberSecurity Serv Contract	CA DEPT OF TECHNOLOGY	$280,128.00	4/1/22	6/30/25
San Bernardino Innovation 2021	COUNTY OF SAN BERNARDINO	$1,520,028.00	9/14/21	12/20/23
CASCADE III	CA GOVERNOR'S OFFICE OF PLANNING & RESEARCH	$25,000.00	5/1/22	6/30/24
OPR Woody Biomass	CA GOVERNOR'S OFFICE OF PLANNING & RESEARCH	$499,688.00	7/1/22	3/30/25
Paso Robles Spacesport	City of Paso Robles	$110,171.00	12/6/22	2/29/24
Fed State Cyber Protection Team	WILLIAM AND FLORA HEWLETT FOUNDATION	$300,000.00	8/1/20	12/1/23

Figure 1 - Active grants during fiscal year 2023-2024

BENEFITS TO CAL POLY

Development

Development at the CCI, managed by Kayvan Chinichian, Senior Director of Development, continues to build systems and relationships to foster more philanthropic support. In 2022-2023, a major priority was to revamp how sponsorships were approached for SGC activities. This goal continues with the new SGC cadence, allowing partners to participate with SGC at multiple points in the year.

Development has also prioritized working with individuals and establishing annual fund support from alums, parents, and friends. Development has, for the second year, participated in PolyGives.

This renewed focus on individual support has meant Development has needed to work with the CCI team to recalibrate projects around student support and project needs, which has also meant that Development, with Communications, has put a new emphasis on marketing tools that help stakeholders stay engaged with CCI activities year-round.

Communications

In 2023, CCI partnered with the Cal Poly Partners to enlist dedicated marketing and communications support. This strategic collaboration, renewed in 2024, has enabled CCI to channel its efforts into crafting a cohesive and uniform messaging strategy across all operational domains, encompassing digital platforms, print materials, and presentations.

During the last year, CCI rebranded and relaunched its newsletter as the 'Cyber/Space Newsletter.' Managed by CCI students, the newsletter has continued to serve as an informative conduit to keep CCI's stakeholders abreast of ongoing activities and engagements. It also remains a reliable source of updates on space and cybersecurity developments relevant to workforce development, domestic security, international initiatives, and forthcoming events. Since July 2024, the distribution of the newsletter has expanded its readership from just over 600 individuals to more than 2,200, with an average open rate of over 48%, beating industry marketing standards for email communications.

 Work has continued on CCI's goal to grow communications outreach, particularly via social media platforms like LinkedIn. During the last fiscal year, CCI has seen considerable growth, most notably in the CCI LinkedIn account, which includes alumni, partners, and more, and now boasts a reach of over 1,400 followers.

A primary focus this past year was maintaining and organizing communication outreach with individuals and partners which led to implementing a new Customer Management System to help track engagements, outreach, and development opportunities. This new tool has successfully consolidated customer and interaction tracking management across CCI operations and teams, aiding CCI Sr. Development Officer in fundraising activities.
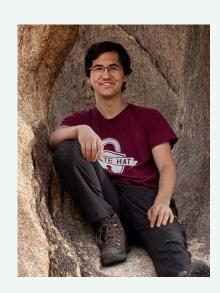
BENEFITS TO CAL POLY

Students

Cal Poly students are a vital part of CCI's programs and operations. Spread across five teams, student assistants focus on game development, communications, technical support, and promotional tasks. Over the course of the year, the CCI employs an average of 20 students across these roles, where through their work they gain valuable knowledge and skills in cybersecurity and public sector support.

JENNY HAUNG

Third-year Computer Science major, Jenny Haung, has always had an interest in technology and has grown a passion for teaching others technology, fueling her passion for teaching middle and high schoolers cybersecurity through the Space Grand Challenge. Jenny credits seeing how much her older brother valued cybersecurity inspired her to take cybersecurity more seriously, putting effort into keeping her data safe from malicious activity.

ISSAC RUDNICK

According to Computer Science major Issac Rudnick, his interest in cybersecurity began in high school with an introductory cybersecurity class and through participating in capture-the-flag (CTF). Before long, he was hooked and got involved in CyberStart America's CTF, eventually competing in and winning their competition. One thing led to another, and soon, he received his first GIAC certification.

Visit Student Spotlights for more.

BENEFITS TO CAL POLY

Events

The CCI annually supports Cal Poly students, faculty, and staff attendance at conferences and events throughout the country supporting cybersecurity, workforce development, and education. Over the last year, individuals and teams participated in 15 external conferences and events and hosted several local collaboration sessions, promoting various program initiatives, including the Space Grand Challenge and workforce development, including:

- Presented at AWS Imagine (July 2023)
- Hosted online session for NASA STEM Engagement Minority University Research and Education Project (July 2023)
- Attended and presented at DEFCON 2023 (August 2023)
- Hosted GenCyber teacher training camp (August 2023)
- Hosted California National Guard (August 2023)
- Presented at USSF Space Systems Command, El Segundo (September 2023)
- Exhibited at the Department of Education Ed Games Expo (September 2023)
- Presented at San Diego CCOE Cybersecurity Industry Economic Impact Forum (October 2023)
- Attended Hewlett Foundation Cybersecurity Awardees Meeting (October 2023)
- Hosted 5G Lab Exploration Forum (November 2023)
- Hosted online session for Space Systems Command Communications & Guidance Narrowband (November 2023)
- Hosted USSF 65th Cybersecurity Squadron and VSFB Digital Transformation Office (November 2023)
- Hosted Cal Poly Military Science Department (December 2023)
- Presented at the National Initiative for Cybersecurity Education K12 Conference (December 2023)
- Hosted online session for Space Systems Command Communications & Guidance Narrowband (January 2023)
- Presented at Vandenberg Space Force Base (February 2024)
- Participated in AWS Higher Education AI/ML Day Event (March 2024)
- Presented at Lawerence Livermore Lab (March 2024)
- Interviewed by Simply Cyber podcast (March 2024)
- Exhibited at RSA Security Conference (April 2024)
- Presented at Municipal Information Systems Association of California (April 2024)
- Hosted the annual Space Grand Challenge competition (April 2024)
- Participated in Cal Poly's Evening of Green & Gold student showcase (May 2024)
- Participated in Cal Poly 5G Lab Advanced Wireless Ag Tech Workshop (May 2024)
- Presented at California Defense Leadership Summit (May 2024)
- Hosted VSFB Digital Transformation Office Off-site Strategy Meeting (May 2024)
- Participated in AWS Higher Education Summit (June 2024)

BENEFITS TO CAL POLY

Accomplishments

CCI has had success across its three work verticals for 2023-2024, this includes:

- Employing 24 Cal Poly student assistants at the CCI.
- Expanding the SGC to a broader audience across 13 states and over six countries.
- Increasing SGC player registration by 114% over the previous season with 750 registered players.
- Invited by the California Governors Military Council and the California Office of Planning and Research to present at the 2024 California Defense Leadership Summit.
- Once again, being invited to present the CCI's programs to multiple state and national organizations.
- Increase of Cyber/Space Newsletter audience by 367% with over 2200 subscribed readers.
- Expanded interactions with DoD through increased collaboration with USSF and work to develop a new Cooperative Development and Research Agreement (CRADA) between VSFB and Cal Poly.
- Launch of Cleared for Success, clearance training program.
- Collaborative development work with regional partners seeking to form the San Luis Obispo County Cybersecurity Consortium (SLOC3).
- Completing grant programmatic work on the California Advanced Defense Ecosystems & National Consortia Effort (CADENCE) and California Advanced Supply Chain Analysis and Diversification Effort (CASCADE).

FINANCIAL ACTIVITY

California Cybersecurity Institute
Statement of Financial Activity
July 1, 2023 - June 30, 2024

Description	
Contracts and Grants Funding	$3,424,629.00
Staff Salaries and Benefits	$227,503.09
Student Assistants	$46,118.04
Travel	$23,552.90
Consultants	$255,693.75
Rent	$12,427.99
Supplies and Materials	$5,485.23
Marketing	$2,590.15
Insurance	$0.00
Total Expenses:	$573,371.15

UNIT ORG & MGMT

Organization

The California Cybersecurity Institute highlights the Cal Poly student body's significant contributions to sustaining our operational tempo while intimately involved in their professional development. Our student developers lead the way in our work, and we ensure they are front and center in all our engagements and activities to demonstrate the intellectual prowess and capabilities of the university.

Resources

Operating at Camp San Luis Obispo enhances CCI's training ability. The base offers a secured military environment and multiple training spaces that enable the CCI to conduct various activities. Additionally, the California Central Coast Forensics Lab (CCCFL), located adjacent to the CCI main office, provides a modern forensics facility that Cal Poly's law enforcement officers have actively used to solve cases in our region.

Staff

Henry Danielson serves as Technical Curriculum Developer, supporting training and cyber education development. Rob Randle serves as Technical Project Coordinator, overseeing CCI's student employees and SGC development and operation. Kayvan Chinichian serves as Senior Director of Development, working directly with partners and philanthropic outreach.

Management

Bill Britton serves as Special Advisor to the President and Director of CCI. Dustin DeBrum is Operations Director for CCI, New Programs, & Digital Transformation Hub (DxHub). Management meets regularly to discuss the priority of efforts and targets of opportunity, including developing strategic and long-range planning to identify and provide a steady stream of partnerships and projects for the CCI. Paul Jurasin, Director of New Programs & Digital Transformation Hub (DxHub), provided oversight to CCI beginning in July 2022 and retired in October 2023.

UNIT ORG & MGMT

Partnerships

The CCI is thankful to all partners and supporters that make our mission possible. Our support came from Local, State, and Federal agencies, private industry, nonprofits/foundations, and individuals.

Local, State, and Federal Agencies

- Air Force Research Labs (AFRL)
- California Department of Technology (CDT)
- California Employment Training Panel (ETP)
- California Military Department, California National Guard
- California State University
- County of San Bernardino
- Governor's Office of Planning and Research, State of California
- National Guard Bureau
- National Security Agency
- United States Space Force (USSF)

Industry Partners

- Amazon Web Services
- Crowdstrike
- Fortinet
- LMNTRIX
- Lockheed Martin Corporation
- Mile2
- Secureworks
- Splunk

Nonprofit Partners

- Aerospace Village
- Cal Poly Corporation
- Cal Poly Foundation
- Foundation for the Future
- National Security Space Association
- William and Flora Hewlett Foundation

Individual Supporters

- Kayvan Cinichian
- Ryan Matteson

To learn more about partnership opportunities with the CCI, please contact cci@calpoly.edu.

FUTURE STATE

Future Projects & Opportunities

For the 2024-2025 fiscal year, CCI will focus on the growth of SGC. This includes increasing opportunities for small gameplay and leveraging existing platform functionality for focused training. To accomplish this goal, CCI is leveraging its in-house AWS knowledge via the DxHub and will engage external partners to aid in developing an improved and modular game platform. The CCI will also focus on the establishment of an advisory board for SGC, intending to help professionalize program offerings and raise revenue.

In coordination with Cal Poly College of Engineering (CENG), the CCI is working to launch the Cleared for Success (CFS) program within the next fiscal year. CFS prepares students to work in secure environments on day one, helping them understand expectations and the type of work they can expect in government/industry. This program will feature new training programs to aid students in understanding secure public and private sector job opportunities. CFS is an expansion of existing campus partnerships with the United States Space Force and DoD partners.

As Cal Poly's partnerships with the defense sector continue to grow, the CCI will seek to build new collaborations with the United States Space Force, Vandenberg Space Force Base, and other DoD branches to support cyber education and training initiatives. The CCI will also continue to offer various learning opportunities for students, affiliated state agencies, and the California Military Department (CMD). Furthermore, CCI is working with regional partners to identify future training opportunities to support both residents and the local workforce's understanding of cybersecurity.

Although participation in the California Advanced Defense Ecosystems & National Consortia Effort (CADENCE) and California Advanced Supply Chain Analysis and Diversification Effort (CASCADE) has ended, CCI and its consortium partners continue to seek new opportunities in collaboration with the California Office of Planning and Research (OPR), to make connections with federal, state, and regional partners to drive innovation and student experiential learning opportunities.

Summary

During the past year, Cal Poly CCI has participated in various lines of effort that further its mission and continue to serve as a resource for university audiences, the state, national workforce, and outside organizations to improve cybersecurity skills and protect individuals and organizations from cyberattacks. The institute focuses on addressing the cybersecurity defense and workforce shortage across the state and upskilling students and professionals in underserved communities nationwide. In the coming year, the CCI will continue to focus on critical initiatives through its train, accelerate, and empower efforts. The CCI will continuously emphasize student participation at the forefront of everything we do. By continuing to expand our efforts and reach a wider audience with the help of Cal Poly staff and students, the CCI expects to build strong partnerships, provide resources to students and professionals, and impact the workforce and cybersecurity space for several years to come.

To learn more about the CCI, visit cci.calpoly.edu.