



CAL POLY
California Cybersecurity
Institute

ANNUAL REPORT

2021-2022

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.

2021-2022

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California Cybersecurity Institute Annual Report

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INTRODUCTION

Message from Director, William J. Britton

Cal Poly's California Cybersecurity Institute (CCI) focuses on addressing our state's severe and growing cybersecurity workforce development challenges. The future vision of the CCI is to create a world-class training and research 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 education, workforce development, and applied research, the CCI works 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.

The CCI consists of three buildings: a cyber forensics lab, an operation and training facility, and a cyber range suitable for hosting large-scale, immersive training events. Through a combination of training courses, grants, special events, donations, and research efforts, the CCI offers an attractive environment for students from technical and liberal arts majors to "Learn by Doing."

Over the last year, we have successfully leveraged the CCI to accomplish several critical stepping-stones toward success and set the stage for some exciting future accomplishments in collaboration with faculty, staff, and students. The CCI currently supports a team of dedicated staff and student employees that drive the vision of the CCI.

I look forward to the exciting road ahead for the California Cybersecurity Institute and the impact this institute will continue to have on Cal Poly's students, staff, and faculty.

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 the state of 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.

MISSION

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.

BENEFITS TO CAL POLY

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. As an Authorized Amazon Web Services (AWS) Training Partner, Cal Poly and CCI delivered AWS training to 615 individuals in 2021 through AWS Discovery Days. CCI also provided digital literacy training to Trust Automation in October 2021.

In partnership with the state of California 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 2021-2022 fiscal year, 57 students were employed at the CCI as Student-Assistants in various roles ranging from developers to communication specialists. The opportunity for Student-Assistants is to work on programs and projects in partnership with professional staff. Some of the projects the student assistants worked on include:

- California Cyber Innovation Challenge (CCIC) 2021 / Space Grand Challenge (SGC) 2022
- Trafficking Investigations Hub (TIH)

BENEFITS TO CAL POLY

Additionally, CCI continues working with private partners to structure programs that grow student professionalism, like the arranged internship program with Dragos. Additional student opportunities included professional certifications and training for platforms like Nvidia, Splunk, AWS, and Fortinet.

Finally, CCI has worked as a thought leader in the cybersecurity space. In addition to some of our past work in the Trafficking Investigations Hub, 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 within the state of California. This work was also aggregated and supported by Cal Poly Student Assistants.

Empower

CCI delivers foundational training to middle and high school students from across the globe through its Cyber to Schools program and California Cyber Innovation Challenge 2021.

Throughout 2021-2022, CCI worked with schools in El Salvador, Kansas City, and the Cherokee Nation to deliver Cyber to Schools content to underserved students in these communities. With a curriculum designed by the CCI staff and industry experts, Cal Poly students served as mentors for these middle and high school students. They regularly met with the Cyber to Schools participants to provide instruction and ensure the completion of coursework and certifications.

Similarly, CCI focused on empowering early education in cybersecurity through the annual California Cyber Innovation Challenge (CCIC). This annual cybersecurity competition 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 Advisor to develop this competition. The CCI Technical Advisor also worked with partners across industry and academia, such as the Royal Melbourne Institute of Technology (RMIT), to create new and unique space and cyber-themed challenges.

For the 2021 competition, 298 students participated. The event was simultaneously broadcast live on Twitch, generating almost 1000 views. During the second half of the 2021-2022 period, CCI Student-Assistants begin working on the successor to the CCIC, the Space Grand Challenge (SGC), scheduled for October 2022.

BENEFITS TO CAL POLY

Grants

Project Name	Sponsor	Grant Amount (\$)	Grant Start Date	Grant End Date
Cybersecurity Space (CASCADE II)	OFFICE OF PLANNING & RESEARCH	\$340,091	7/1/2019	11/30/2021
GenCyber Space Cybersecurity Camp	NATIONAL SECURITY AGENCY	\$99,341	4/1/2020	3/31/2022
Initial Emp Training Contract	CA EMPLOYMENT TRAINING PANEL	\$175,890	5/18/2020	5/17/2022
Digital Literacy	TRUST AUTOMATION	\$50,000	6/15/2020	12/31/2021
Fed/State Cyber Prot Team FDN	WILLIAM AND FLORA HEWLETT FOUNDATION	\$300,000	6/29/2020	1/31/2023
Space Commercialization	OFFICE OF PLANNING & RESEARCH (CADENCE)	\$308,158	9/1/2020	8/31/2022
Verizon Volunteerism	VERIZON FOUNDATION	\$49,996	1/1/2021	12/31/2021
Focused Internship	DRAGOS, INC.	\$64,818	1/1/2021	12/31/2022
Disaster Recovery Engr	SENSEMAKERS LLC	\$29,449	1/1/2021	10/31/2021
Incident Handling Engr	SENSEMAKERS LLC	\$18,999	1/1/2021	10/31/2022
Cyber Security Services Contract	CA DEPT OF TECHNOLOGY	\$50,000	4/15/2021	4/14/2024
Advancement Officer	WILLIAM AND FLORA HEWLETT FOUNDATION	\$600,000	5/1/2021	5/1/2025
Digital Forensics For Cybershield	DOD - NATIONAL GUARD BUREAU	\$45,000	7/2/2021	7/31/2021
Cherokee Nation Pilot	CHEROKEE NATION FND	\$25,394	8/26/2021	8/25/2022
San Bernardino Innovation 2021	COUNTY OF SAN BERNARDINO	\$1,520,028	9/14/2021	9/13/2024
Operational Support Grant	VERIZON FOUNDATION	\$15,000	12/17/2021	12/31/2022
Cyber Security Services Contract	CA DEPT OF TECHNOLOGY	\$19,040	3/1/2022	2/28/2023
Cyber Security Serv Contract	CA DEPT OF TECHNOLOGY	\$280,128	4/1/2022	6/30/2024

BENEFITS TO CAL POLY

Accomplishments

CCI has had success across its three work verticals for 2021-2022, this includes:

- Training 355 individuals on cybersecurity (in addition to 615 trained on AWS through AWS Discovery Days),
- Employing 57 Cal Poly students as Student-Assistants at the CCI,
- Expanding the California Cyber Innovation Challenge (CCIC) to a broader national audience, hosting 298 players for the first time,
- Participating and publishing work on the California Advanced Defense Ecosystems & National Consortia Effort (CADENCE) and California Advanced Supply Chain Analysis and Diversification Effort (CASCADE), and hosting a public forum on its findings at Cal Poly in April 2022,
- The Trafficking Investigation Hub (TIH) helping draft policy recommendations for the state of California, one of which passed the State Assembly in May 2022 (AB 2130: requiring various EMT classifications, upon initial licensure, to complete at least 20 minutes of training on issues relating to human trafficking),
- Cyber to Schools introduced cybersecurity to 762 middle and high school students across four regions.

EXTERNAL RELATIONS

Development

CCI, during this period, prioritized shifting towards opportunities for fundraising and sponsorship to bolster activities further and support the overarching mission of the CCI. The early portion of the FY was crafting and recruiting for a position, in partnership with the University Development and Alumni Engagement (UDAE), to help the CCI make this transformation. In November 2021, Kayvan Chinichian joined CCI as the new Senior Director of Development for the CCI in November 2021.

The Senior Director of Development, since January 2022, has been working on revamping sponsorship opportunities at the CCI, recalibrating innovative programs and projects and coordinating them with other entities at Cal Poly, as well as increasing communication and exposure of CCI activities with Cal Poly alumni.

Communications

In 2021, the CCI emphasized renewing communication products to expand outreach, including a revamped website with refreshed branding for the future Space Grand Challenge and a focus on communicating ongoing efforts and activities to keep audiences informed about upcoming events, training, and projects.

CCI dedicated additional resources to maintaining its monthly newsletter, Space & Cybersecurity Newsletter (initially launched in November 2020). The Space & Cybersecurity Newsletter aims to inform CCI audiences about current space and cybersecurity news relating to workforce development, domestic security, international efforts, and upcoming events.

The CCI also launched a new podcast series, the Cyber Diner, in August of 2021. The series included six episodes with a range of experts from the cybersecurity space. All episodes are available on Spotify, YouTube, and the CCI website. CCI also hosted and participated in several webinars and news interviews covering various topics, including the CCI's Space Grand Challenge competition, cybersecurity best practices, and preparing for careers in the technology industry. News clips and webinars are available on the CCI website and YouTube.

Finally, CCI has planned a new emphasis on building professional followings for social media through targeted communication and timely postings about CCI activities. The priority for this year was LinkedIn, with the goal of growing connections by fifty percent by the end of the fiscal year.

EXTERNAL RELATIONS

Events

The CCI annually supports Cal Poly students, faculty, and staff attendance at conferences and events throughout the country in support of cybersecurity, workforce development, and education. The CCI participated in 8 conferences this past year, promoting various program initiatives, including the newly launched Space Grand Challenge, Cyber to Schools, and workforce development. Furthermore, CCI participated in several cyber-related events for the community, state, and Cal Poly students over the last year, including:

- Hosted the GenCyber Space Camp (July 2021)
- Speaker at California State University Connect Conference (July 2021)
- Attended the UC Cybersecurity Summit (October 2021)
- Hosted the California Cybersecurity Innovation Challenge (CCIC) (October 2021)
- CTF featured at Aerospace Village at RSA (June 2021)
- CTF featured at Aerospace Village at DEF CON (August 2021)
- CTF shared with Blacks In Cyber (February 2022)
- Exhibitor at the NSSA The Defense and Intelligence Space Conference (February 2022)
- Exhibitor at the CubeSat Developers Workshop (April 2022)
- Hosted the CADENCE Site Visit (April 2022)
- Hosted the Public CADENCE Showcase (April 2022)
- Speaker at CyberLeo Conference (May 2022)
- Speaker at National Initiative for Cybersecurity Education (NICE) Conference (June 2022)
- Student Assistants joined RSA Scholars Program (June 2022)

FINANCIAL ACTIVITY

California Cybersecurity Institute Statement of Financial Activity July 1, 2021 - June 30, 2022

Description	Amount (\$)
Contracts and Grants Funding	+\$4,016,327
Staff Salaries and Benefits	-\$354,587
Student Assistants	-\$48,491
Travel	-\$3,793
Consultants	-\$100,468
Rent	-\$24,868
Supplies and Materials	-\$29,096
Marketing	-\$11,505
Insurance	-\$6,230
Total Expenses	-\$579,038

UNIT ORGANIZATION AND MANAGEMENT

Organization

The California Cybersecurity Institute Fall 2021 Organizational Chart highlights the Cal Poly student body's significant contributions to sustaining our operational tempo while intimately involved in their professional development. We ensure that the Cal Poly student is 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. The CCI continues to utilize the associated warehouse as a modular training space featuring the Cal Poly Learn by Doing immersive training for our cyber innovation challenges. Additionally, the California Central Coast Forensics Lab (CCCFL), located adjacent to the CCI main office, provides a modern forensics facility that Poly's law enforcement officers have actively used to solve cases in our region.

Management

Bill Britton serves as Director, and Martin Minnich serves as the Program Manager for CCI. The Director and Program Manager meet 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. Due to COVID, Minnich has continued to oversee CCI operations while working remotely out of state over the last fiscal year. Additionally, Minnich announced his resignation from Cal Poly during the next fiscal year reporting period, effective July 31, 2022.

UNIT ORGANIZATION AND MANAGEMENT

Partnerships

Local, State and Federal Agencies

- 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
- Royal Melbourne Institute of Technology (RMIT)
- United States Space Force

Industry Partners

- Amazon Web Services
- Crowdstrike
- Fortinet
- LMNTRIX
- Mile2

UNIT ORGANIZATION AND MANAGEMENT

- Secureworks
- Splunk
- Twitch

Nonprofit Partners

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

FUTURE STATE

Future Projects & Opportunities

The CCI continues to offer various learning opportunities for students, with a curriculum that can evolve based on the identified needs of Cal Poly, affiliated state agencies, and the CMD. The CCI is working to include professional training certifications focused on other sectors connected to the Department of Homeland Security's (DHS) identified "DHS Sectors of Critical Infrastructure."

For the 2022-2023 fiscal year, CCI will look to grow the size and scope of its Cyber Capture the Flag (CtF) event by launching the Space Grand Challenge (SGC) in October 2022. This event expands the scope of the 2021 Cyber Innovation Challenge, bringing together players from around the world in a gamified cyber competition.

Additionally, in coordination with Cal Poly, the CCI is focused on developing the Cleared for Success program to foster a ready workforce prepared for secure jobs on day one. This program will include a secure facility at Camp San Luis Obispo and new training programs to aid Cal Poly students in understanding secure public and private sector job opportunities.

Finally, Cal Poly's AWS Training Program seeks to expand its reach in the coming years by partnering with the California Employment Training Panel, Amazon Web Services, UpSkill California, and Cal Poly Extended Education. Professionals across the state will have the opportunity to earn AWS cloud certifications and learn from Cal Poly's AWS-certified instructors, who are experts in utilizing the cloud. This training program will upskill and reskill the workforce to prepare them for careers in the decade of tech.

To learn more about the training programs offered by the CCI, visit our website: <https://cci.calpoly.edu/training>

FUTURE STATE

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 our website: <https://cci.calpoly.edu/>