

# CAMP CYBERBOT

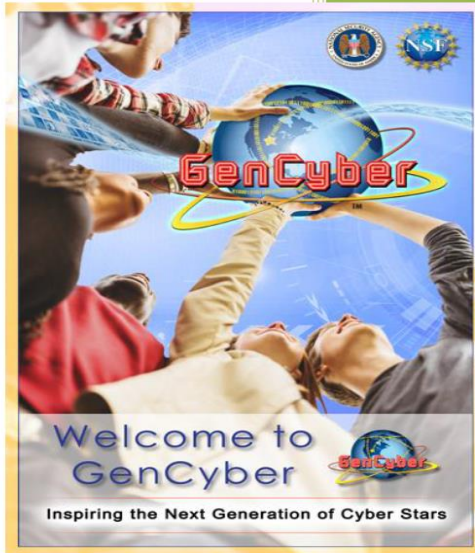
Dr. Pauline Mosley, PI





# STUDENT LAB BOOK

## 2016 Camp CyberBot



Pace University  
Seidenberg School of CSIS  
July 2016

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# LOST TOP SECRET CODES

## Scenario:

The United States Navy has lost one of its Remotely Operated Vehicles (ROV) in Choate Pond. This vehicle is marked with Top Secret Codes to communicate between Navy submarines. Due to security reasons and highly classified information, they must be located immediately.



# LOST TOP SECRET CODES

## Mission:

Build a ROV as a team to search and retrieve the lost codes without getting caught by the enemy-hackers. Once this mission is completed you will be promoted from Seaman to Master Chief.



# CYBERSECURITY WATER ROBOTICS

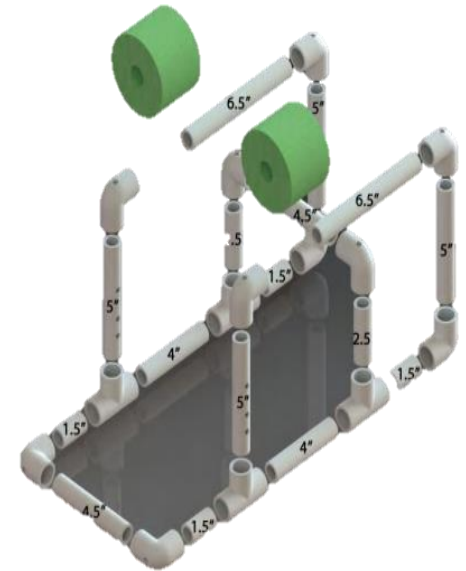
- STUDENTS are placed in teams of 5 to build an underwater robot to compete in the lost codes challenge.
- Each student is given a specific roles to form cohesion and demonstrate the “modularity” principle of cybersecurity.
- The challenge consisted of teams using their rovs to find codes placed on the “mother ship” rovs.
- During challenges teams were either mission seekers or hackers in the challenge.
- The water robotics challenge allowed students to demonstrate the following principles:
  - I. ROV design: simplicity
  - II. Team roles: layering
  - III. Challenges: information hiding,

# CYBER CHALLENGE – FINDING THE SECRET CODES

- 3 Teams were divided into Hackers or Mission Seekers (Domain Separators) for the final challenge.
- **Hacker teams** were challenged to reach the mothership and read the partial url codes on the mothership and enter the completed url into a browser to complete the challenge.
- **Mission seekers:** practiced the principle of Domain Separation and tried to protect the Mothership from the hackers trying to read the codes. The objective was to block the hackers in any way possible and protect the Lost Codes on the Mothership from the hackers.

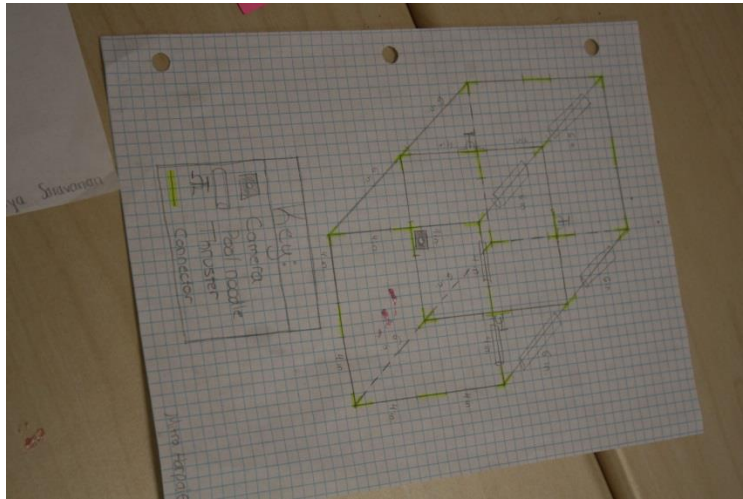
# SEAPERCH

- **using water robotics in cybersecurity**
- Students were provided design information in their welcome packet which explained expectations for creating their own seaperch design as part of a team challenge.
- Students were given original seaperch schematics for direction, in addition to what equipment would be used.
- Students were further challenged with incorporating a secure place on their roV to attach an underwater camera.





# ROV DESIGN - TEAMWORK



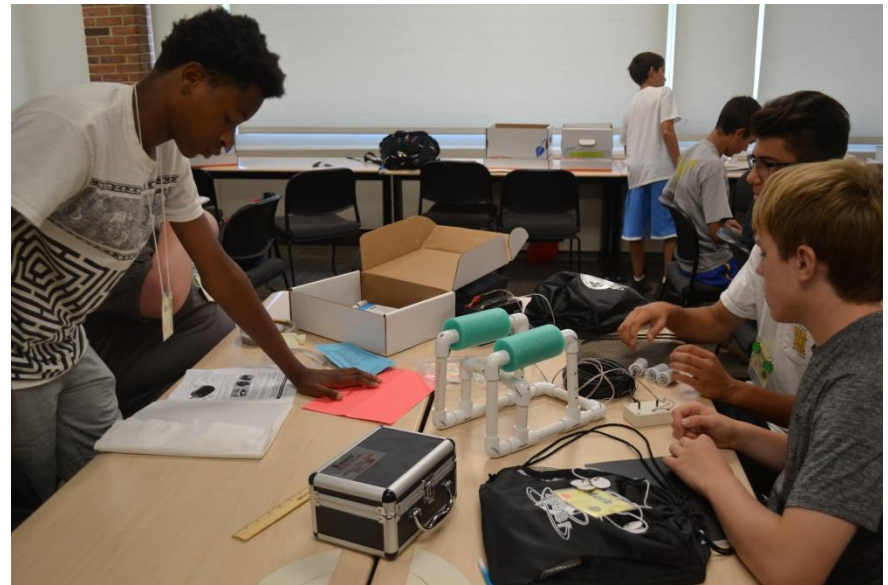
# ROV DESIGN - TEAMWORK



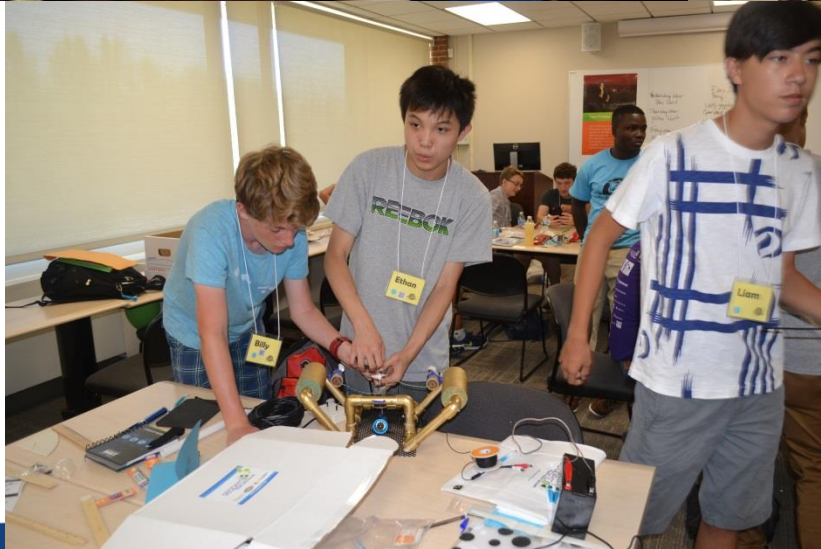
# ROV BUILDING - TEAMWORK



# ROV BUILDING - TEAMWORK

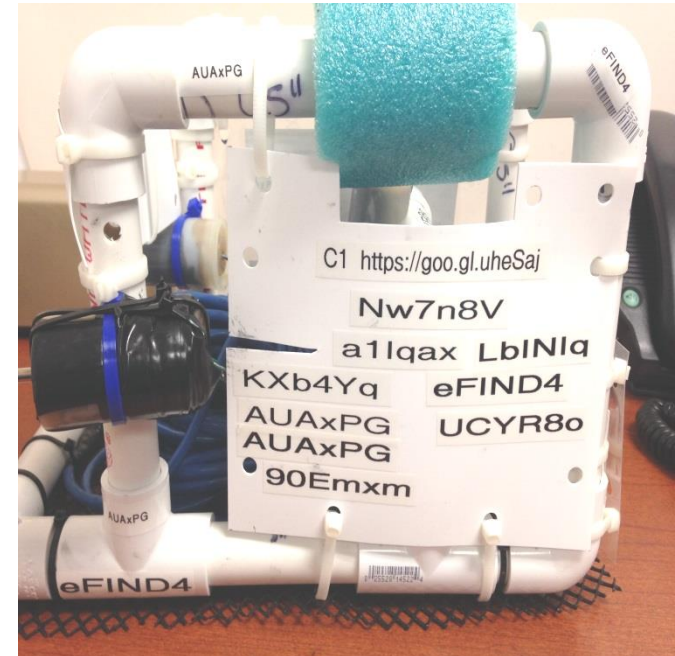


# ROV BUILDING - TEAMWORK



# ROV TESTING - TEAMWORK

- Teams tested their rovs in the pond to verify rovs maneuverability, camera visibility and team work by collecting partial url codes.
- Each url code represents one cyber security principle. The goal is for each team to collect all codes and enter their teams information online. This test is similar to for final lost code challenge.



# ROV TESTING - TEAMWORK









**Camp Cyberbot**  
**Water Robotics Practice Challenges**  
**Wednesday, July 27, 2016**

**Team Copy**

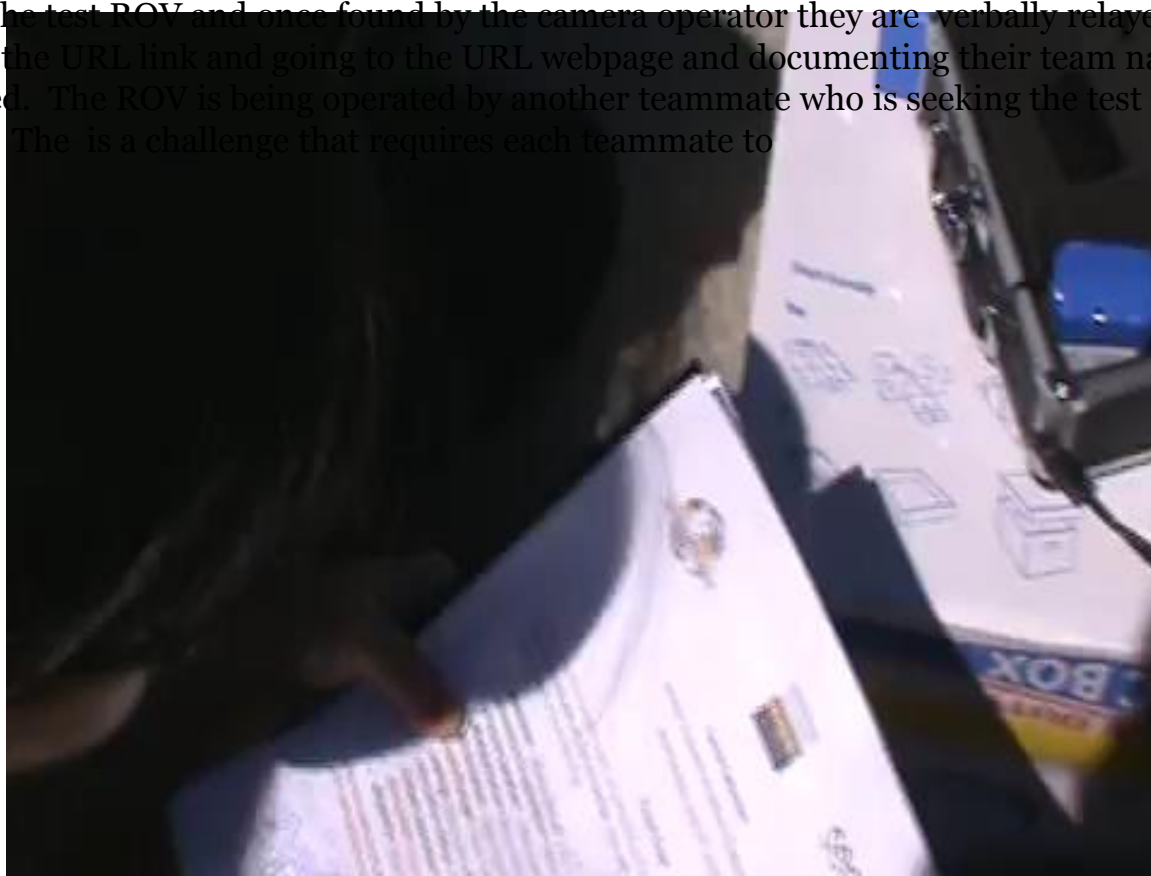
Please collect as many codes as possible and match them to the appropriate Cyber Security Principle on the list below. You will need to visit the complete URL site for team credit of each finding.

- Welcome: <https://goo.gl/>\_\_\_\_\_
- Resource Encapsulation: <https://goo.gl/>\_\_\_\_\_
- Process Isolation: <https://goo.gl/>\_\_\_\_\_
- Modularization: <https://goo.gl/>\_\_\_\_\_
- Minimization: <https://goo.gl/>\_\_\_\_\_
- Least Privilege: <https://goo.gl/>\_\_\_\_\_
- Layering: <https://goo.gl/>\_\_\_\_\_
- Information Hiding: <https://goo.gl/>\_\_\_\_\_
- Domain Separation: <https://goo.gl/>\_\_\_\_\_
- Abstraction: <https://goo.gl/>\_\_\_\_\_
- Simplicity: <https://goo.gl/>\_\_\_\_\_

Write the code found below. After you visit the full webpage link check off which principle your code belongs to above.


# Testing phase video

This team is demonstrating a full team effort to complete the test challenge. She is writing down URL codes in order to virtually collect all cybersecurity principles through a live URL link. The codes are located on the test ROV and once found by the camera operator they are verbally relayed to teammate completing the URL link and going to the URL webpage and documenting their team name which is timestamped. The ROV is being operated by another teammate who is seeking the test ROV with the codes on it. This is a challenge that requires each teammate to



# THE MOTHERSHIP



# Seaperch cyber challenge – finding the lost codes

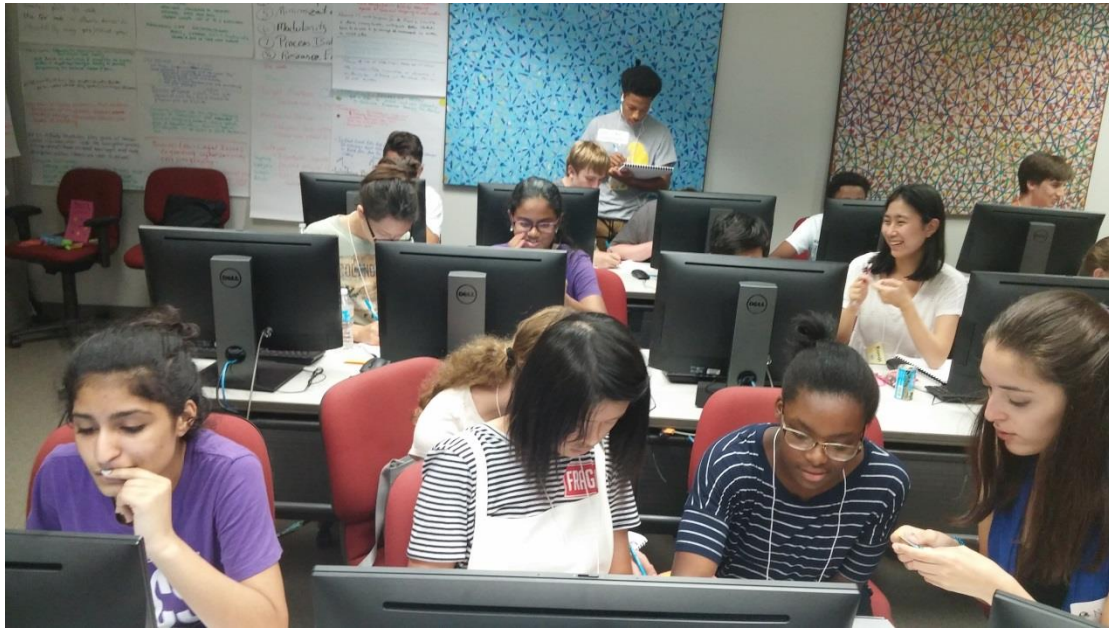




# THE WINNING TEAM



# CYBERSECURITY LAB



# CYBERSECURITY LAB ACTIVITIES





# SPY GLASSES

- STUDENTS USED SPY GLASSES TO....
- INVESTIGATE THE “PRIVACY” PRINCIPLE OF CYBERSECURITY. This activity demonstrates around giving students an understanding of ethical/moral practices. Is it ok to photograph someone without their permission?
- Spy glasses were also used to demonstrate the need to protect your information at all times. An example of protecting your information was during the designing phase of the seaperch when students were able to take pictures of other team’s designs.
- **The spy glasses were also used to.....**



# Token System

- Reward system used in all games and as an incentive.
- tokens are awarded to students who win special games.
- Tokens are used as exchangeable chips between students who correctly answers cyber principles trivia between each other during play cyber challenges.
- 



# Play cyber

- STUDENTS challenge other students with a cybersecurity principles trivia cards Using a token exchange
- Students were given a set number of tokens on the first day of camp.
- If a student were unable to answer the question posed by another student incorrectly, the student would have to forfeit one of their chips.
- Students use gencyber playing cards to verify correct answers.
- If both students are wrong no tokens are exchanged.
- Students who accumulated the most tokens in a set amount of time won a prize.

# Play cyber Rules

- **Rules To The Game:**
- 1) Any student can challenge any student to play at anytime - the student must accept the challenge.
- 2) If both students are wrong - no tokens are exchanged.
- 3) If both students are correct - no tokens are exchanged.
- 4) A token can only be earned if a student fails to answer the scenario correctly. He or she must give a token to the other player.
- 5) A student may borrow a max of 5 tokens from the bank each day.
- 6) The Game will officially end on Thursday after lunch - at that time all students **MUST** cash in their tokens to the Token Bank.
- 7) If the students are unsure about who is correct - they will see an instructor.

# Cybersecurity jeopardy

- A cybersecurity principles jeopardy game...

First Principles	IP Addressing	Privacy	Encryption	Cyber Security	World Wide Web
▶▶▶ Final Jeopardy ◀◀◀					
<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>
<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>

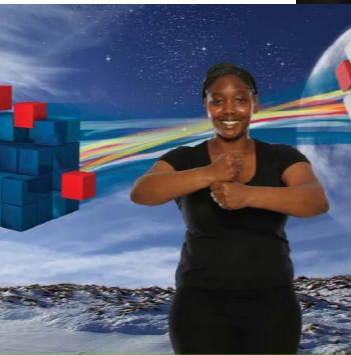
# Cybersecurity principles dance off

- STUDENTS competed in a dance off to demonstrate cybersecurity hand signs.
- Students were allowed to chose to compete individually or in a team.
- Students picked songs played on youtube for their danceoff
- Student/teams that demonstrated the most cybersecurity hand signs awarded a prize.
- Judges based winner on number of hand signs, routine and audience response to dance.

# principles: #5 Layering & #8 Modularization



Layering



Modularization



# Principles #1 Domain Separation & # 7 Information hiding



Domain Separation



Information Hiding





# Principles: #8 Modularization & #9 Simplicity



Modularization



Simplicity



# Girls cyber principle Demonstration



Minimization



Modularization



Process Isolation



Simplicity



Information Hiding



Domain Separation



# Girls cyber principle Demonstration



# Student feedback



## HAVE YOUR SAY!

Please complete BOTH camp surveys. Your camp experience is important to us... so tell us what you think!

GenCyber Camp Survey  
[goo.gl/l3eDGI](https://goo.gl/l3eDGI)



Student Survey  
[goo.gl/iOolro](https://goo.gl/iOolro)

