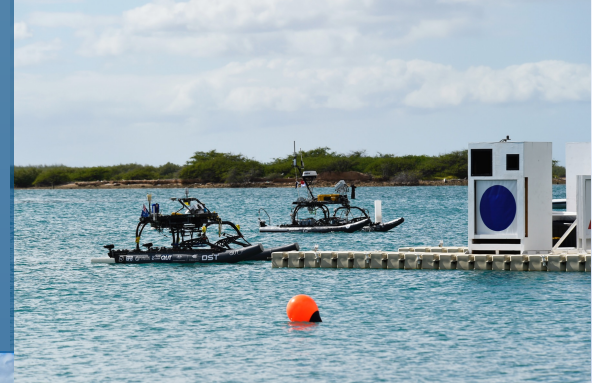




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ROBOTX TEAM TIME

Wednesday, April 3, 2024 | 9:00 a.m. Eastern (US & Canada) Daylight Time



Welcome 2024
RobotX Teams!

GET
STARTED



ROBOTX TEAM TIME #1

AGENDA

- [09:00-09:10] Welcome & Competition Introduction
- [09:10-09:20] Venue & Schedule Expectations
- [09:20-09:40] Task Ideas Overview
- [09:40-09:50] Data Sharing Introduction
- [09:50-10:00] Questions?

1

Edit your name to "Name | Team Name"
E.g., Aamir | University of RobotX

2

Let us know in the chat:



What year(s) have you competed in RobotX?





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ROBOTX 2024

 November 3-10, 2024

 Nathan Benderson Park,
Sarasota, Florida, USA



Credit: City of Irvine

Meet the Humans



Aamir Qaiyumi
Technical Director



Julianna Smith
Director of Program Operations



Lindsey Groark
Vice President of Programs



Cheri Koch
Senior Events Manager



Laverne Imori
Competition Coordinator



Joe Conway
Technical Manager



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














Welcome 2024 Teams

19 Teams

Status Update

- How many people support your project?
(students + mentors/advisors)
- Is your team developing a UAV for competition?
- Has your team continued work with the HSI camera?



 Advancing Science, Technology, and Art / University of California San Diego Team Inspiration / Triton-AI Read More ▾	 Embry-Riddle Aeronautical University Team Winton Read More ▾	 Flinders University Team Wildu Read More ▾
 Florida Atlantic University Omltanoreus Read More ▾	 George Mason University GMU Robotx Read More ▾	 Georgia Institute of Technology Marine Robotics Group Read More ▾
 Istanbul Technical University ITU UZMAR Autonomous Sailing Team Read More ▾	 Korea Maritime and Ocean University KMOU MACRO Read More ▾	 Kyushu Institute of Technology OUMT-Polaris Read More ▾
 Lake Superior State University Team AMORE Read More ▾	 Nanyang Technological University SINGABOAT2024 Read More ▾	 National University of Singapore Bumblebee Autonomous Systems Read More ▾
 Pontificia Universidad Católica de Chile Caleuche Read More ▾	 Pontificia Universidad Católica del Perú TutiTeam Read More ▾	 Singapore University of Technology and Design MARVL Read More ▾
 The University of Queensland Team Mantis Read More ▾	 University of Florida/Machine Intelligence Laboratory Navigator AMG Read More ▾	 University of Louisiana at Lafayette Bayou Bot Krewe Read More ▾
 University of Newcastle NU MARINE Read More ▾		



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Competition Structure



Autonomy Challenge

Build an AMS based on a standard platform to showcase autonomous performance.



Design Documentation

Prepare documentation showcasing AMS design and competition strategy.

Design Documentation

- *Team Website*
- *Technical Design Report*
- *Team Intro Video*
- *Design Presentation*
- *System Assessment*



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Timeline

Date / Deadline	Event
November 1, 2023 – March 18, 2024	Registration
September 23, 2024	Event Submissions Deadline <ul style="list-style-type: none"> • Team Information • Background Checks • On-Site Requirements • Merchandise Order • Award Information
September 30, 2024	Design Documentation Deadline <ul style="list-style-type: none"> • Technical Design Report • Team Video • Website • Community & Outreach (optional)
November 3-10, 2024	2024 Maritime RobotX Challenge



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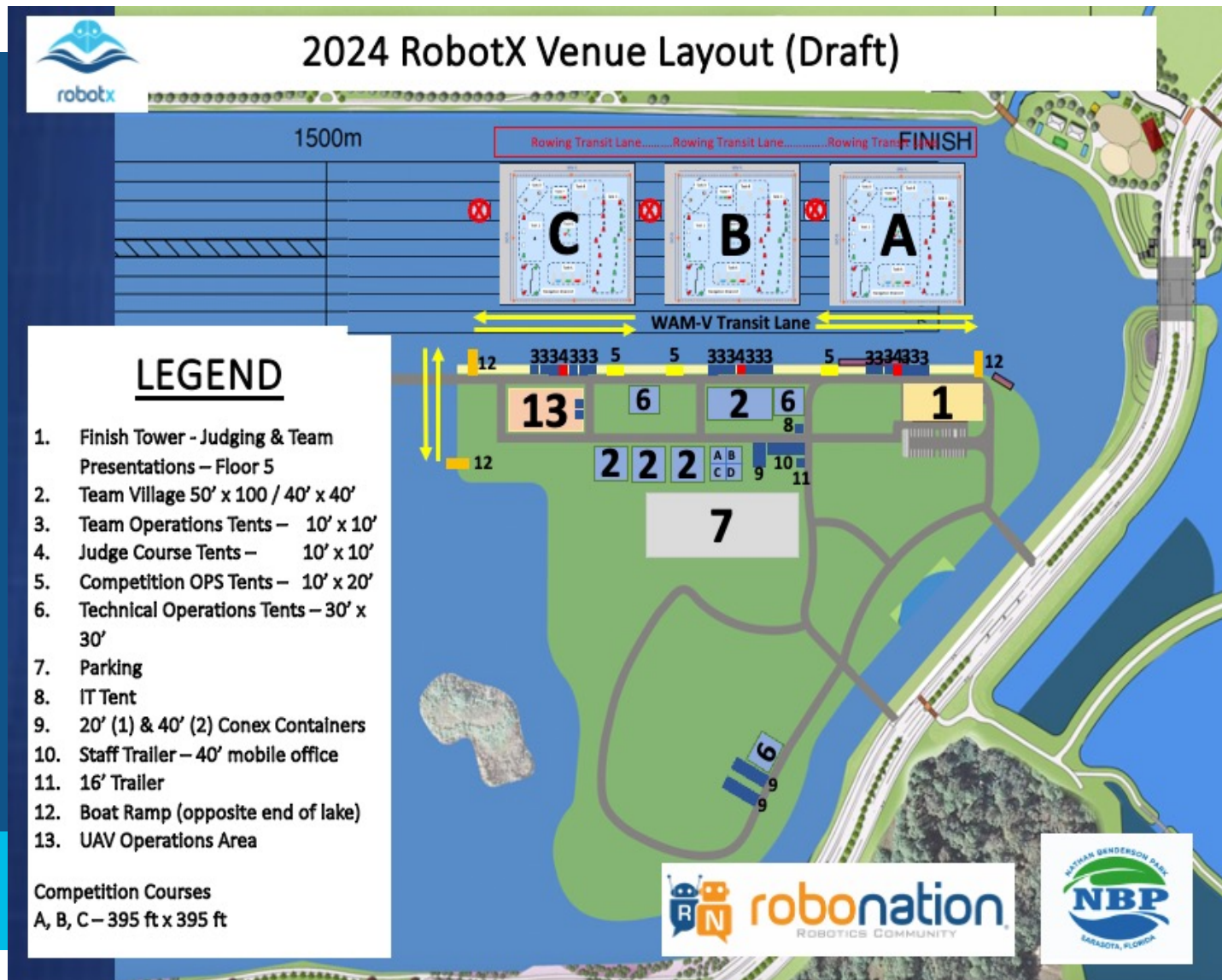
Preliminary Schedule

Sunday 3 November	Monday 4 November	Tuesday 5 November	Wednesday 6 November	Thursday 7 November	Friday 8 November	Saturday 9 November	Sunday 10 November
	0730 Team Meeting						
Team Check-In	0800-1700 Autonomy Challenge Practice & Qualifying Safety Inspections			0800-1700 Autonomy Challenge Semi-Finals Day 1	0800-1700 Autonomy Challenge Semi-Finals Day 2	0800-1100 Third Chance / Finalist Practice Runs	900-1700 Team Pack-up
Mandatory Orientation							
Pilot Flight Tests							
	<div>Presentations & Assessments</div>						
						1200-1600 Autonomy Challenge Finals	
	1800 Team Meeting					1800-1900 Awards	
	1900 Venue Closes						

Nathan Benderson Park

Sarasota,
Florida

OVERVIEW



Accommodations

Options

1. Local Hotel

- Conference hotel to be selected soon
- Rates range from \$150 - \$200 per night for quad occupancy

2. Airbnb or VRBO –

- Whole house or apartment
- Sleeps 6 - 8
- Rates range from \$165 - \$515 per night (plus fees & cleaning surcharge)



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Shipping 101

How to Start - Get Help!

- RoboNation Freight Forwarder (selected soon)
- RoboNation – Cheri Koch – ckoch@robonation.org

RoboNation Responsibilities

- Shipping Stipend for selected teams
- Transportation from port of entry (Tampa) to competition
- All transfers and storage during RobotX event
- Transportation back to port of entry
- Ends when shipment leaves Sarasota or one week after competition ends



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Shipping 101 (cont.)

Team Responsibilities

- Planning – begin preparing a shipping plan NOW!
- Crate Inspection / Determination Shipping Worthiness for all Crates / Boxes
- Develop a packing plan (packing list, weights, packing materials)
- Batteries, Batteries, Batteries – Dangerous Goods
- Determine Importation Customs Type - CARNET or Temporary Import Bond
- Inbound and Outbound Shipping – Air vs. Ocean
- Prepare to complete all shipping paperwork – Bills of lading, customs power of attorney, packing lists, safety data sheets, hazardous material forms, etc.



YOU GOT THIS!

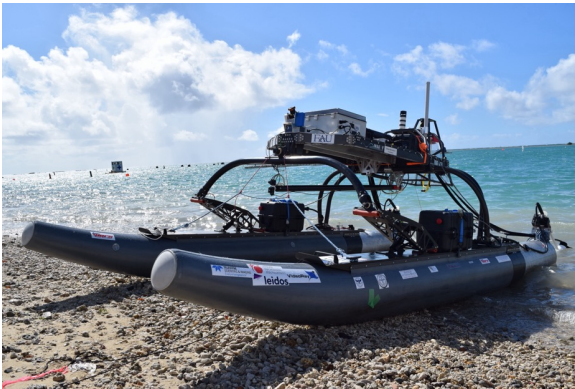


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Getting In & Out of Water

- Beaching
- Deploying





Primer & Task Ideas

Task Overview

USV Demonstration



Safety
Check



Navigation
Demonstration

Mandatory before deploying

UAV Demonstration



Safety
Check

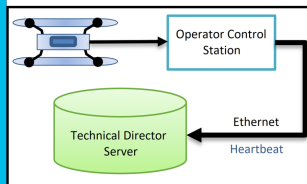


Pilot Safety
Check + Demo

Mandatory before deploying

Task 1

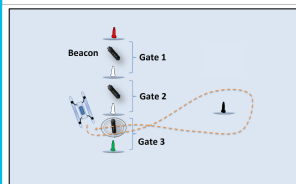
Situational Awareness



AMS transmits messages reporting various behaviors and data collected in course.

Task 2

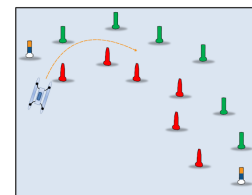
Entrance & Exit Gates



AMS detects active beacon and enters and exits course through corresponding gates.

Task 3

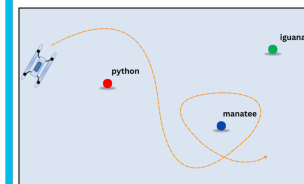
Follow the Path



AMS maneuvers pathway.

Task 4

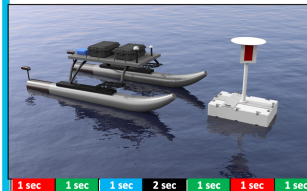
Wildlife Encounter



AMS detects and scans signatures / RGB images, signaling USV to circle.

Task 5

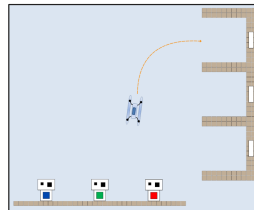
Scan the Code



AMS observes and reports three-light sequence display.

Task 6

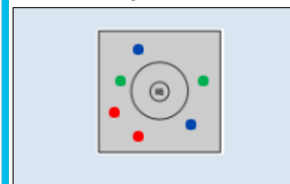
Dock & Deliver



AMS detects colored panels, docks in bay and delivers racquetballs.

Task 7

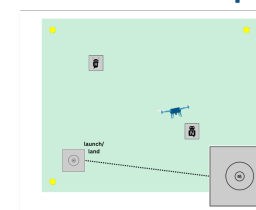
UAV Replenishment



AMS launches UAV, locates floating helipad, collects and delivers tin to other helipad.

Task 8

UAV Search & Report



AMS launches, conducts search of field and reports location of two objects.

Autonomy Challenge

Qualifying Round

- Qualifying and Practice Course accessible for teams upon completion of safety checks and mandatory tasks
- Multiple teams on course
- Teams schedule times to practice or qualify individual tasks with Technical Director

Semi-Finals Round

- Semi-Finals Course accessible for qualified Semi-Finals teams
- Only one team on course at a time
- AMS demonstrates ability to collect and use information from individual tasks to complete other tasks
- Teams may attempt tasks in any order
- AMS must operate autonomously for entire run

Finals Round

- Finals Course accessible for qualified Finals teams
- Only one team on course at a time
- AMS demonstrates ability to collect and use information from individual tasks to complete other tasks
- Teams may attempt tasks in any order
- AMS must operate autonomously for entire run



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USV Demonstration

Mandatory Activity

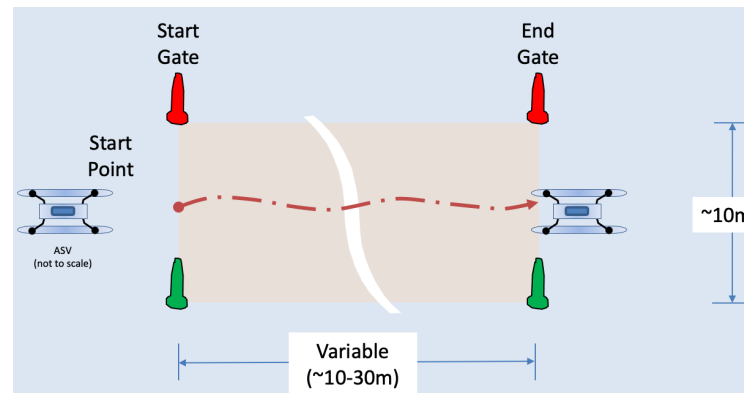
The inspection and demonstration must be successfully completed as prerequisites for entry to the practice courses.

1 Static Safety Inspection

- . USV must meet all safety requirements:
 - . Buoyancy pods
 - . Emergency stop system
 - . Tow points and tow line
 - . Lift points are clearly marked
 - . Safety requirements for propellers (and propeller guard)
 - . All systems are properly secured

2 Dynamic Navigation Demonstration

- . USV must autonomously maintain positive control, detect channel markers, and successfully navigate through two sets of gates.



UAV Demonstration

Mandatory Activity

The inspection and demonstration must be successfully completed as prerequisites for entry to the practice courses.

1 Static Safety Inspection

- . UAV must meet all safety requirements:
 - . Propellers
 - . Motor mounts
 - . General airframe & wiring integrity
 - . Battery security
 - . Battery capacity checks
 - . Range test(s)
 - . Integrations tests with autonomous systems

2 Pilot Safety Check

- . Autonomous flight control disconnected to enable manual flight control mode to demonstrate the pilot's ability to take control of the drone/aircraft and land it safely.

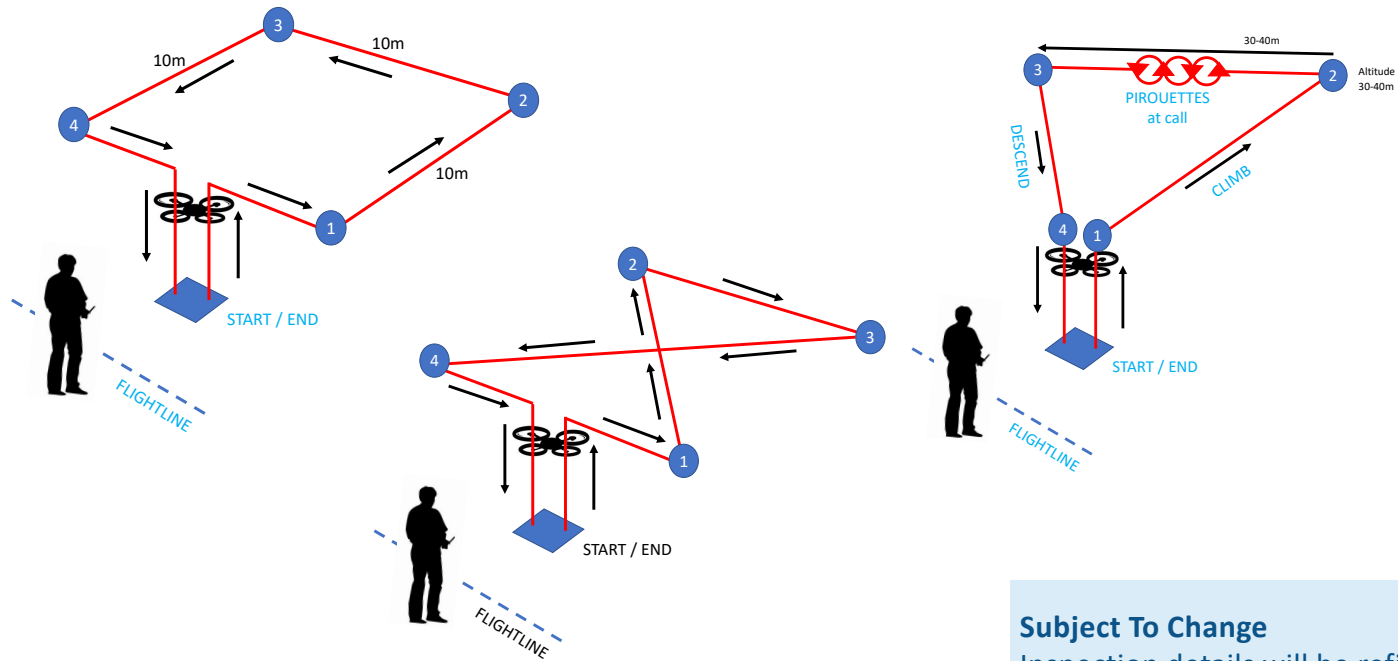
Subject To Change

Inspection details will be refined in accordance with host nation requirements.

UAV Demonstration

Pilot Safety Check

The following maneuvers are required as part of the **Pilot Safety Check**.



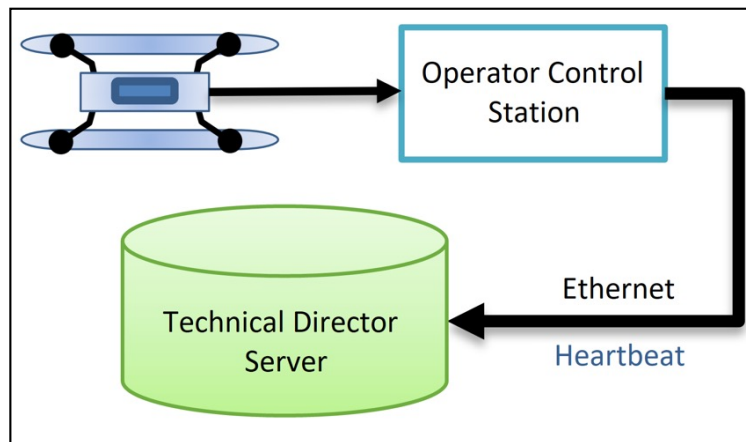
Subject To Change

Inspection details will be refined in accordance with host nation requirements.

Situational Awareness & Reporting

Task 1

- The AMS transmits a heartbeat message to the Technical Director (TD) Network.
- During Semis/Finals runs, The AMS transmits specific messages reporting various activity and data collected throughout the run.
- All messages are required to follow the format outlined in the Team Handbook.

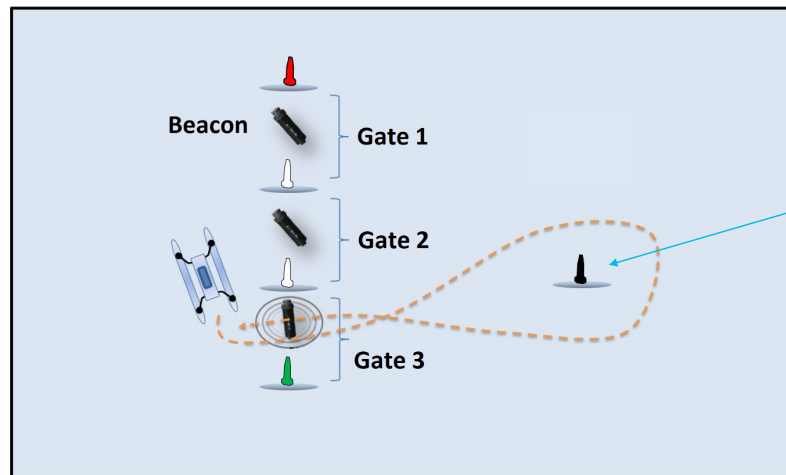



- Teams are provided a wired RJ45 connection to transmit from the team's Operator Control Station (OCS) to the TD Network, in the course operations tents along the shoreline.

Entrance and Exit Gates

Task 2

- The AMS detects the active beacon and navigates through the corresponding gate. Only one beacon on each course will be activated at any time.
- During Semis/Finals runs, AMS enters the course through the active gate before proceeding to other tasks and exits through the active gate at the end of the run.

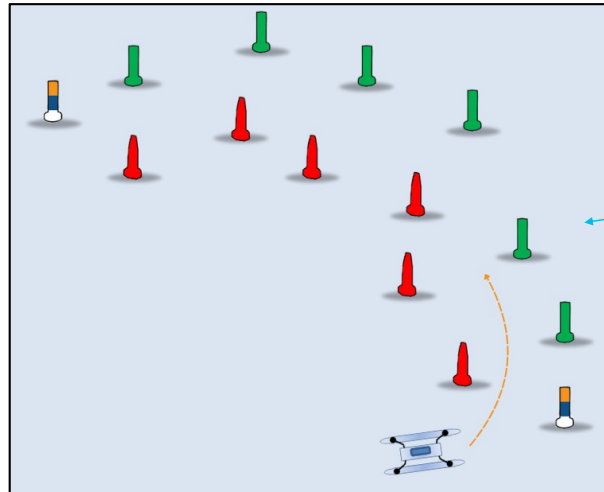


 **Heartbeat Message:**
Additional points available
for reporting AMS activity.


Follow the Path

Task 3

- The AMS navigates through the pathway. Teams will be instructed to use pathway to either exit or return to harbor, considering the expression, "red right returning." The AMS must avoid all obstacle buoys in pathway.
- Exit harbor: red buoys on port (left) side during navigation
- Return to harbor: red buoys on starboard (right) side during navigation



Example:
AMS exiting harbor.

 **Heartbeat Message:**
Additional points available
for reporting AMS activity.

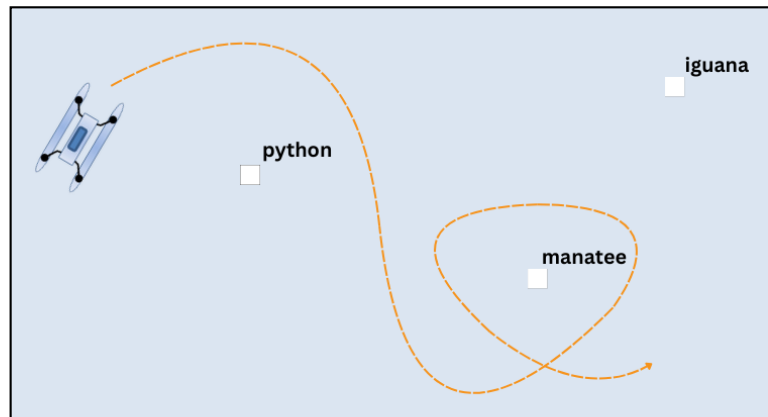
Wildlife Encounter

Task 4

Hyperspectral Imaging

RoboNation is working to acquire the hyperspectral paint for this task. There is an alternative task approach on the next page.

- The AMS detects and scans each spectral signature, signaling the USV to circle each marine creature as specified. For example:
 - Circle the python in clockwise direction.
 - Circle the manatee in anti-clockwise direction.
 - Circle the iguana in any direction.



Graphic Display:

Additional points available for developing graphic display.



Heartbeat Message:

Additional points available for reporting AMS activity.

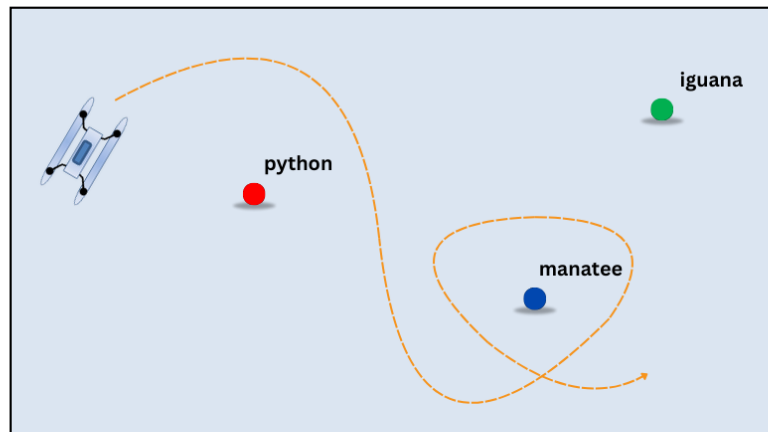
Wildlife Encounter

Task 4

No Hyperspectral Imaging

As a backup plan for not acquiring the hyperspectral paint for this task, this is an alternative approach to this task.

- The AMS must detect and scan each colored buoy, signaling the USV to circle each marine creature as specified. For example:
 - Circle the python (red buoy) in clockwise direction.
 - Circle the manatee (blue buoy) in anti-clockwise direction.
 - Circle the iguana (green buoy) in any direction.



Graphic Display:

Additional points available for developing graphic display.



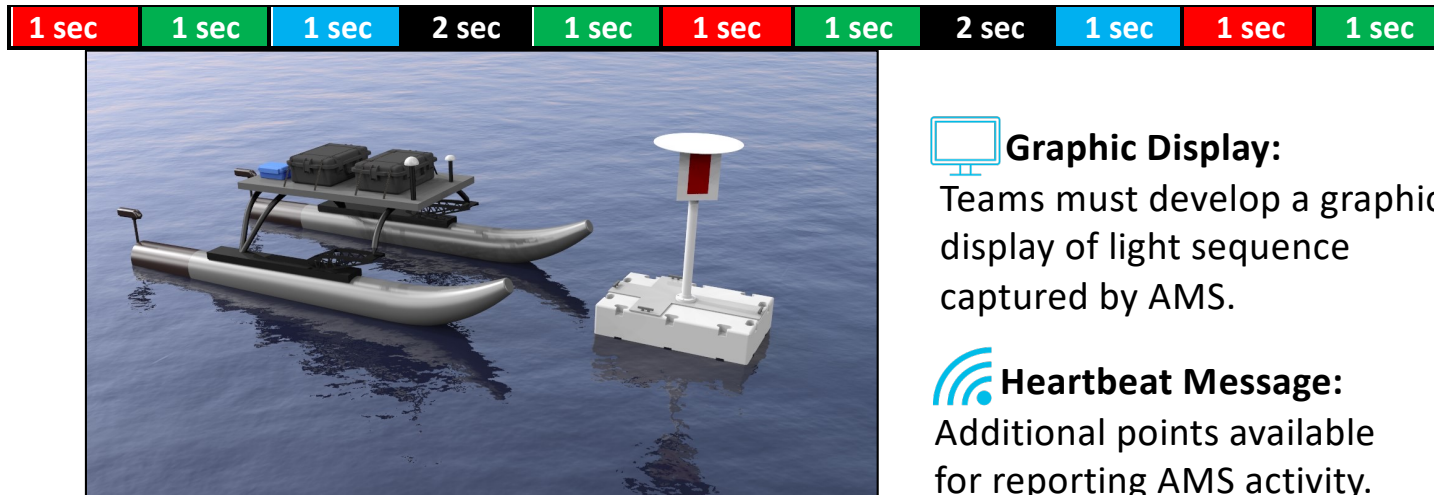
Heartbeat Message:

Additional points available for reporting AMS activity.

Scan the Code

Task 5

- The AMS observes the three-light sequence display and reports the RGB colors observed in the sequence they appeared.
- This light sequence informs the AMS of the correct information to complete other tasks in the Semi-Finals and Finals Rounds.



Graphic Display:

Teams must develop a graphic display of light sequence captured by AMS.



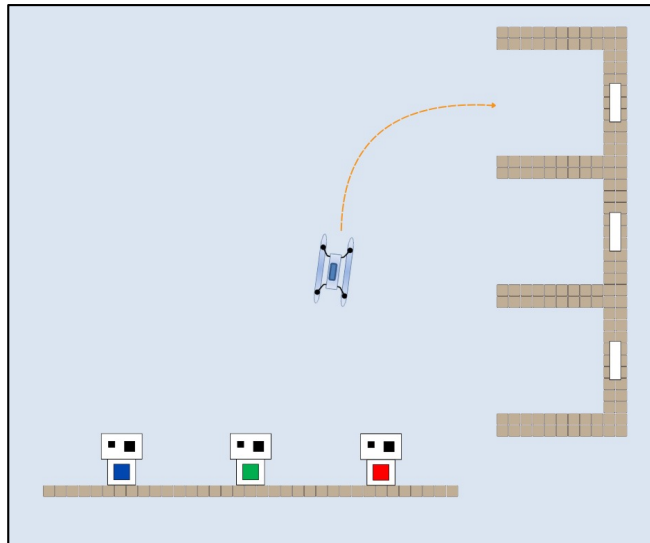
Heartbeat Message:


Additional points available for reporting AMS activity.

Dock and Deliver

Task 6

- The AMS detects different colored panels (red, green, or blue) and docks in the corresponding bay.
- Each panel has a colored square and two square holes. Once the AMS has found the designated color and docked, the system flings racquetballs into either of the two holes.



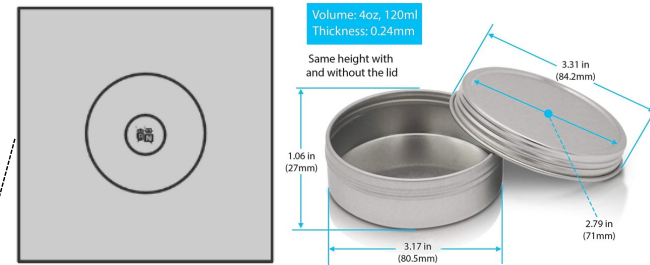
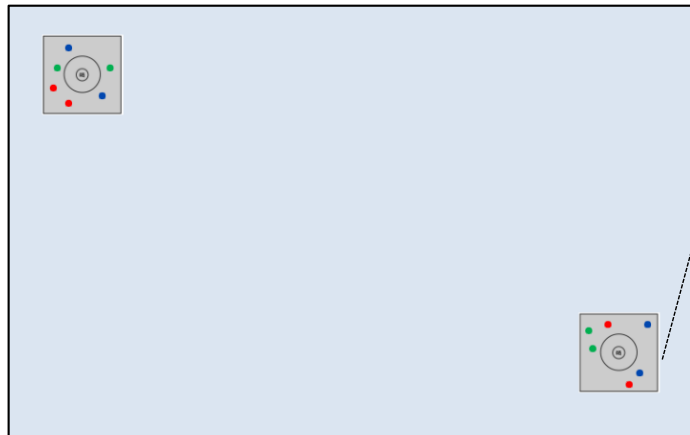
 **Heartbeat Message:**
Additional points available
for reporting AMS activity.


UAV Replenishment

Task 7

Feedback Request:
What weight do you want the tins?

- This task is designed to be accomplished by a UAV.
- The UAV launches from the USV, locates a floating helipad, and collects a small colored tin (red, green, or blue).
- The UAV delivers the tin to the circular target area on another floating helipad, then returns to the UAV.
- This task will be available on land for practice.



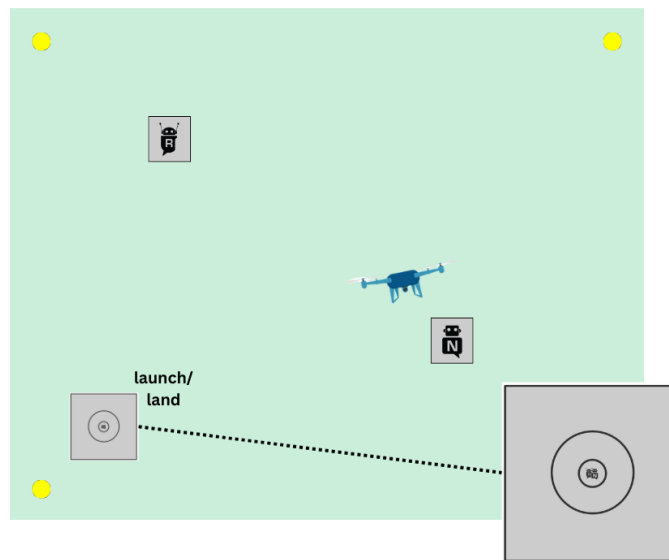
 **Heartbeat Message:**
Additional points available
for reporting AMS activity.


UAV Search and Report

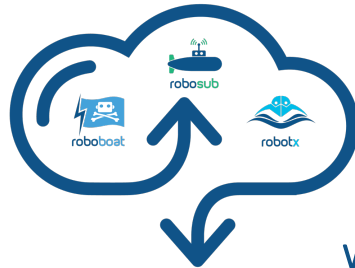
Task available both on water and on land.

Task 8

- The UAV launches from designated start point (or directly from USV), conducts a search of a field marked by four orange markers, detects and determines the location of two distinct objects.
- This task will also be available on water as an official Semis/Finals task.



 **Heartbeat Message:**
Additional points available
for reporting AMS activity.



Data Sharing

What is Data Sharing?



Centralized Repository



Community Driven



Competition
focused

Vision
Acoustics
Mechanical Designs
Electrical Designs



DATA FOR ALL
TEAMS



LARGE DOMAIN
OF DATASETS



BETTER PLATFORM
FOR NEW TEAMS





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Get Started



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How to Get Started:

- ☐ Task Ideas
- ☐ Competition Strategy
- ☐ AMS Design Process
- ☐ Secure Travel and Shipping Plans
- ☐ TeamTime Meetings





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TeamTime



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RobotX 2024 TeamTime Meetings

- #1 03 April | Open to All
- #2 12 June | Registered Teams
- #3 11 September | Registered Teams





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Stay Connected



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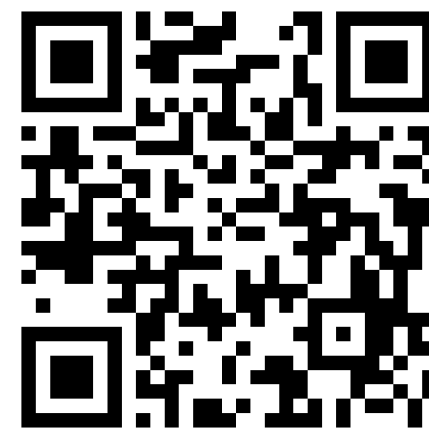
RobotX 2024 Discord



Discord

JOIN TODAY!

- Scan the QR Code
- Select the RobotX24 role
- Turn on notifications





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Get Started



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QUESTIONS?





robonation



seaperch



seaglide



gosense



roboboat



robosub



robotx



RoboNation is a 501c3 nonprofit organization whose mission is to provide a pathway of hands-on educational experiences that empower students to find innovative solutions to global challenges. Working together with the industry, research and educators, we have grown to include over nine student competitions and programs and engage more than 250,000 students per year.

For more information contact university-competitions@robonation.org