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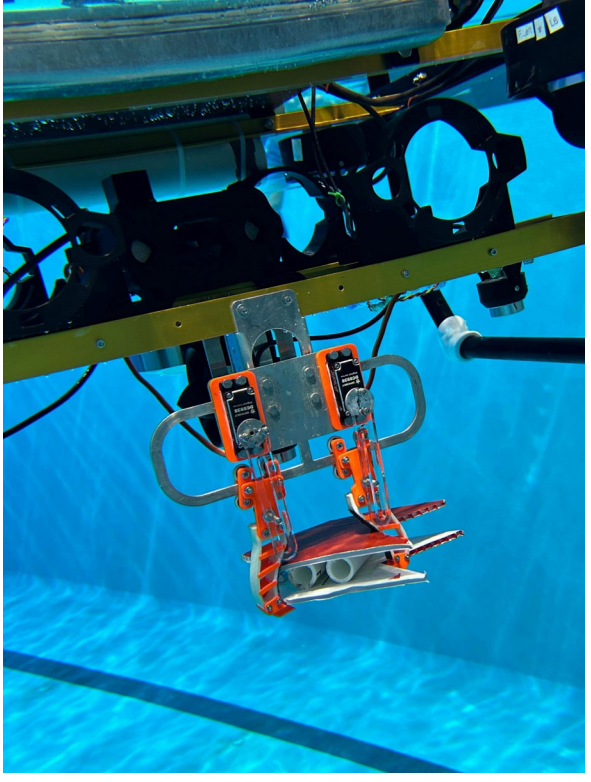
ARVP

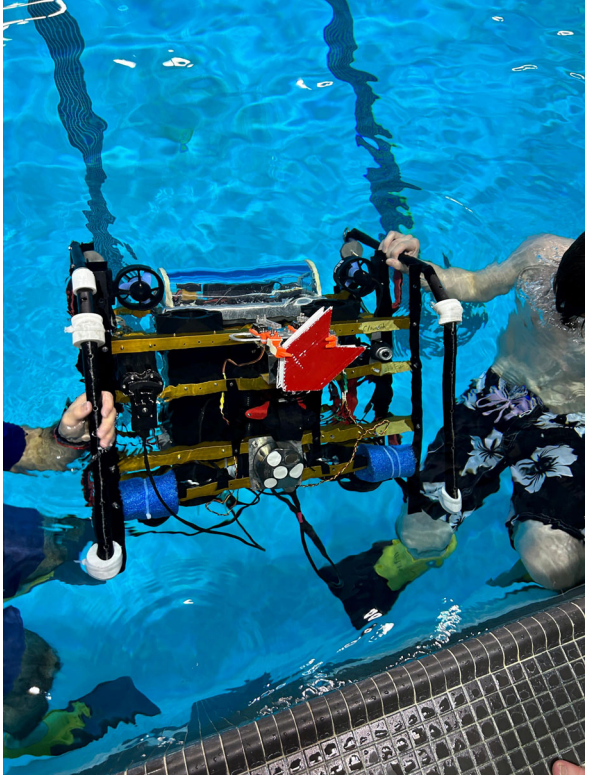
NEWSLETTER

FEBRUARY/MARCH, 2024

Join Our Community Showcase!

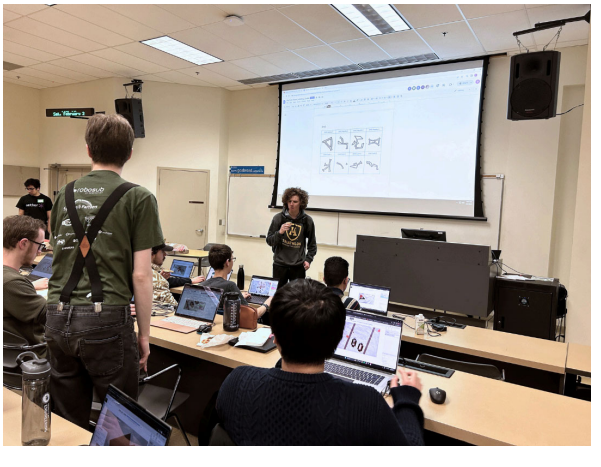
The Autonomous Robotic Vehicle Project is cordially inviting you to our 2024 Sponsorship Showcase on Sunday April 21, 2024 from 1 PM to 2:30 PM at the Kinsmen Sport Centre. Our current sponsors, prominent UofA faculty members, and alumni from across the club's long history are coming down to visit. If you've ever wanted to know more about ARVP, meet our members, and see Arctos in action, this is your chance. We will be hosting a $20k fundraiser with a catered lunch, a presentation for the "State of ARVP", and full demo of our robot's 2023 obstacle course run. Sign up here: https://bit.ly/ARVP_Showcase_RSVP



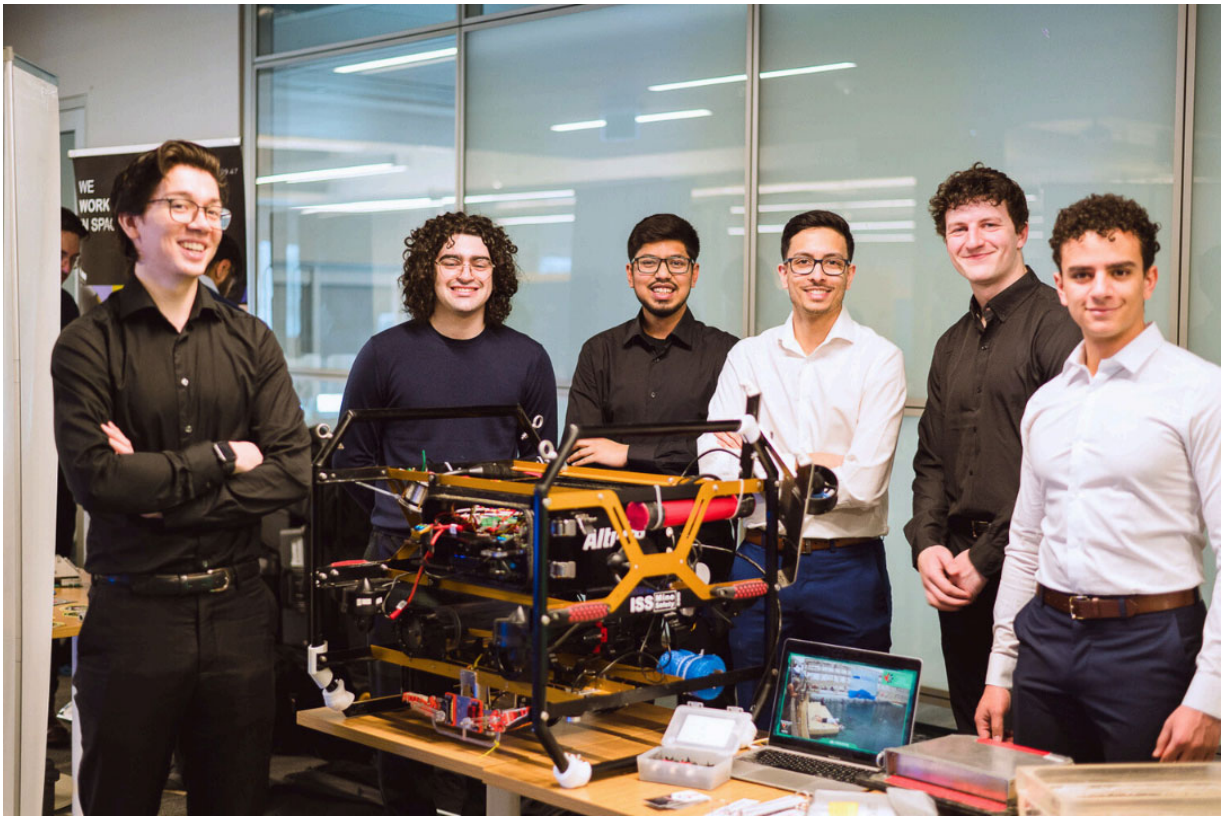


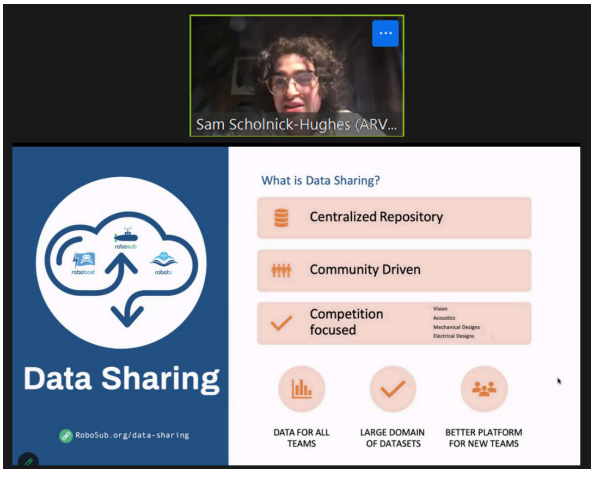
On a less cordial note - sorry for the delay! We've had issues with authenticating our newsletter system, and we may experience some further disruptions as problems are diagnosed and solved. The timing was unfortunate considering the number of achievements we've hit in the last two months. We'd like to share some highlights below.

Labeling for all competition tasks has been completed! This allows us to train a machine vision model that will detect objects and help Arctos interact with them. It all started with our labeling party on February 2nd, where we labeled approximately 2.5k images! Some require a significant amount of effort like our 13 shape/image octagon pictures. But we pulled through the night with the promise of free pizza.



From a reach perspective, these past two months have been tremendous. Our very own Sam Scholnick-Hughes was also co-presenter in Robosub's first Team Time of the year, where he promoted the Robosub Data Sharing Committee to help every team attending the competition train their models faster! Members have attended Mecha Mayhem, APEGA Community Events, ECE/MECE First Year Nights, and Admitted Student Days to help engage younger students in robotics, and hopefully join ARVP in the future. We've also been extremely fortunate to have executive members attend the Canadian Business Leader Awards, meet the Albertan ministers as the UofA joined the NATO DIANA test center network, and engage directly with Tesla engineers when they visited our lab. These opportunities to deepen our network in our local and global communities have been incredibly rewarding, and we're looking forward to future reach engagements.





Work on Arctos itself has been equally promising and equally frustrating. In February, Electrical and Mechanical systems on Arctos were confirmed complete for the April Showcase. However, software development has been hampered by multiple leaks through the front cap of Arctos, which has forced us to cancel multiple tests early. An interim solution prior to replacing the front lid is still in progress, but we're hopeful we'll be able to demonstrate Arctos' full capabilities for the showcase still. That said, significant process has still been made. In March, we completed our first ever successful claw manipulation task by picking up a chevron from an elevated platform. This accomplishment is only rivaled by the university of Singapore, the top competitor from RoboSub 2023.

Beyond the showcase, future Arctos developments are being prepared for installation in early May. External battery pods and a new sonar system will be added to Artcos. With the functionality these systems bring, we will have the capacity to achieve 1st place at RoboSub 2024. Design for the next autonomous underwater vehicle after Arctos is also underway, but initial procurements have

unfortunately stalled due to a lack of funds. Hopefully we can overcome this issue with the showcase!

ACCOMPLISHED TASKS ✓

☑ All the Outreach 💪

☑ Rotating Vision Bounding Boxes (ft. YoloV8) & Successful Claw Pickup

☑ Live Streamed Testing Capabilities (available soon)

MEMBER QUOTE 😎

"New Electrical Lead."

- *Cody Sorochan (Electrical Member)*

"I'm not getting downgraded bro."

- *Logan Krezan (Project Co-Lead)*

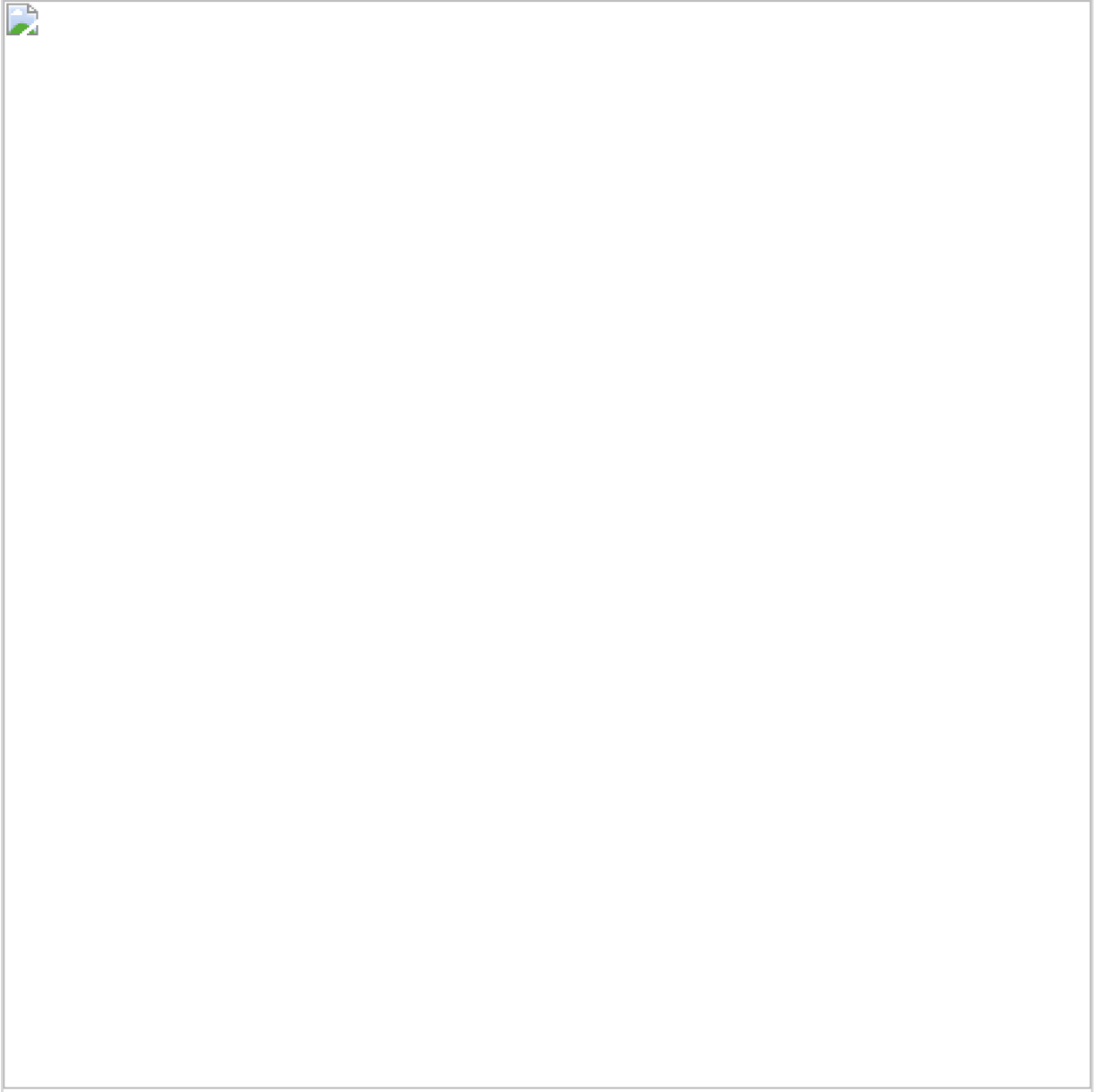
Software: The Simulator!

ARVP is only able to pool test Arctos biweekly. Consequently, the Software Team has been pressed for time and has needed to devise an alternative method to run supplementary tests for operation confirmations. Our custom-built simulator was designed to quickly test and verify other subsystems in the software stack, even testing full-length missions in a virtual environment.

The simulator is built on top of Gazebo with custom plugins to simulate the hydrodynamics of the robot, control thrusters and actuators on the robot. Generating mock sensor data to interface with the rest of the software stack. Gazebo gives us the flexibility to quickly modify plugins, models, and worlds when needed, while also being tightly integrated with ROS2. Giving our Software Team more flexibility on when to test new updates!

Tesla Visit!

Checkout our time with Tesla this month!



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On March 22nd @teslamotors visited the UofA! As a autonomous robotics project group, we had the opportunity to meet some of the bright minds of Tesla's engineering team!

Our team had a great time showcasing what we've been working on and what members have been doing. A big thank you to the @ualberta_engineering faculty and Tesla team for setting this up!

#UofA #Tesla #ARVP #MachineLearning #AI

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