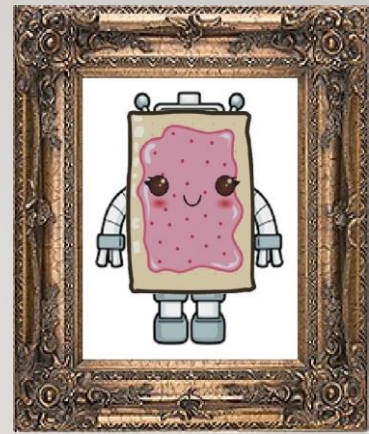


TELEOPERATED ROBOT ART



RYAN GIBBS, DOROTHY KIRLEW, ASTHA PRASAD, SIDA WANG

INTRO VIDEO



PROJECT GOALS

- Teleoperate HERB using Razer Hydra
- Use HERB to paint with multiple colors
- Lock paintbrush to canvas

RAZER HYDRA

- 6 DOFs and 7 buttons on each controller
- Smooth relative position by averaging performed over every 15 inputs
- Using 3 buttons – one analog trigger, two binary buttons
- Publishing at a rate of 10Hz



ROS COMMUNICATION



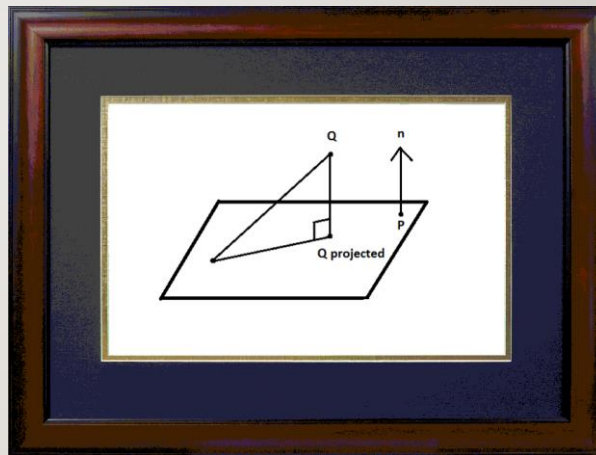
- Interpreted input from razer hydra to send:
 - Relative X,Y, and Z delta positions
 - Binary indicators of:
 - Tele-Op
 - Lock to Plane
 - Rotate Wrist

FUNCTIONS

- Relative XYZ positions used to servo joints based on Jacobian
- Look ahead collision checker ensures HERB does not collide with environment
- Planner used to change wrist orientation to dip brush
- Lock to plane restricts HERB's hand to move in a plane parallel to canvas

LOCK TO PLANE

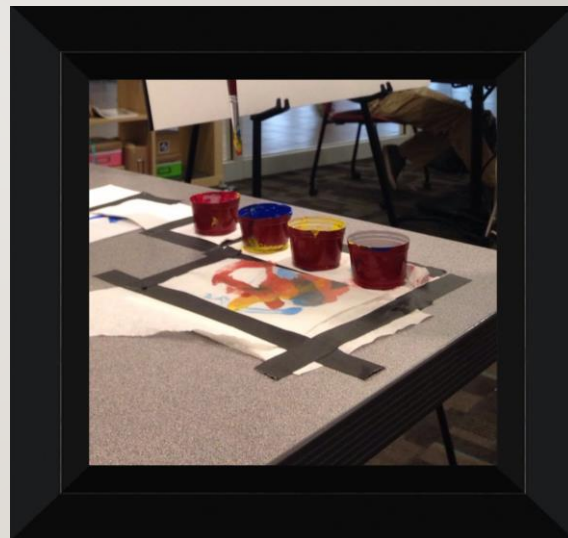
- Point in 3D is projected onto a plane parallel to the canvas
- $Q \text{ projected} = Q - \text{dot}(Q-P, n) * n$
- Canvas normal is defined while defining the environment



SIMULATION VIDEO



SET UP

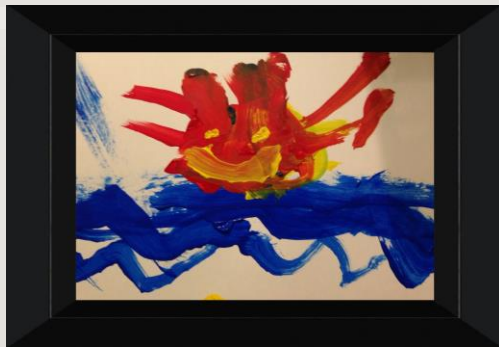


FINAL VIDEO





RE Triangle



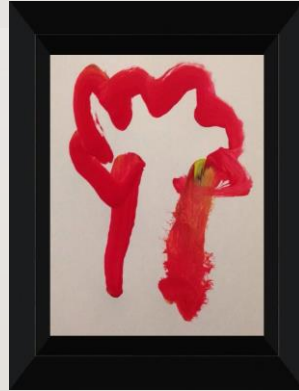
Happy Sea Demon



*Angler Fish Attack
on Love*



Swan



Red Broccoli



*Woman on Trapeze
Fleeing Sun*

“OMG is that a swan?!”
-S. Srinivasa

USER REVIEWS

“It’s really fun”
-S. Srinivasa

“Oh my god this is so much fun”
-Sidd Srinivasa

“I have no idea what I’m doing but it’s fun”
-Siddhartha Srinivasa

“Big circles, very bold”
-Professor Srinivasa

“I don’t know why it’s fun, but it’s a lot of fun”
-Siddhartha Srinivasa

“It’s super awesome, I love it!”

-Professor Srinivasa

“I’m very proud of myself”
-Professor Srinivasa

“This is so much fun!”
-Mr. Srinivasa

“I’m so scared”
-Sidd

“Oh my god, I’m rocking it”
-Sidd

“Highly addictive”

-Experienced User

“Oh my god, can I change colors?!”
-S. Srinivasa

USER REVIEWS

“It works.”

-Laura Herlant

THANK YOU

SPECIAL THANKS TO LAURA, SIDD, AND MEMBERS OF THE PERSONAL ROBOTICS LAB