Eco-Dolphin I

Kevin Matiko
  • Lead Engineer/Designer

Carlsvi Finn
  • Attitude Control Engineer

Jonathan Jaworski
  • Structural Engineer

Ryan Gauthier
  • Computer Engineer

Dr. Hong Liu
  • Advisor

• Highly integrated and streamlined Autonomous Underwater-Vehicle (AUV) development.
Objectives

Phase I: Yellow Eco-dolphin

• Cruise autonomously 32 feet below the water, at 6.5 ft/sec.

Phase II: Buoy Control systems

• Communication with ground station via Buoy relay system.

Phase III: Blue and Red Eco-Dolphin

• Communication among a small fleet of AUV’s (3).
Vehicle Design

Yellow Eco-Dolphin

Body: Elliptic

Weight: 132lbs.

Length: 4ft.

Width: 1ft.

Thrust: 2 x 15 lbs
Symmetry allows for equal and counteracting forces on top and bottom control surfaces, thus resulting in net-zero lift at zero angle of attack.

Source: White “Fluid Dynamics”
Propulsion Design

Yellow Eco-Dolphin

• 2 – Brushless/DC thrusters powered by two 22 volt Lithium-Polymer battery packs.
• The pitch control design involves changing the Center of gravity instead of redirecting the thrust.
We will utilize the Non-linear Wave lab in the Lehman Building.
• Pose and position determined through active sonar relay system.
Blue & Red Eco-Dolphin

Phase 3

- Cooperatively missions such as surveillance or environmental monitoring.

- Send and receive high volume message, including pictures through wireless network when it is surfaced.

- Communicating small volume messages, commands and status under water through acoustic sensor network.

- The fleet can relay message from ground station (Laptop) to surfaced AUV, then from surfaced AUV to submerged team members to fulfill mission cooperatively.
Conclusion

- AUV Research and Development
- Testing and Simulation
- Building a Cooperative fleet of AUV’s
- Mathematical modeling and underwater mapping
Sponsors

- Mathematics
- Student Government Association (SGA)
- The Fund for Embry-Riddle
- Ignite
- Embry-Riddle Aeronautical University Honors Program
- Hydroplus Engineering
Contacts

Kevin Matiko  
Kevino@my.erau.edu

Carlsvi Finn  
Carlsvif@my.erau.edu

Jonathan Jaworski  
Jaworskij@my.erau.edu

Ryan Gauthier  
Gauthier@myerau.edu

Dr. Hong Liu  
Liuho@erau.edu