**Background**

Underwater ordnance is a growing concern for mariners worldwide. These mines are placed in shallow water or continental shelves during periods of war. While some minefields are effective, some are not and these mines are left to age in the ocean. These aging mines pose a huge safety and environmental concern due to unstable nature of the ordinance. It is not uncommon for live mines to wash ashore and threaten the local population. With age, the mine with malfunction due to corrosion and cause detonation. Many of the current solutions to subsea mines are expensive and complicated. The ORC project is a low cost solution to naval mine removal.

**The Crawling Systems**

Unlike traditional ocean crawlers the ORC uses a worm screw propeller design. These are designed to help provide additional thrust when in open water. However more importantly they are necessary for the maneuverability of the crawler on the ocean floor, especially sandy or muddy surfaces where traditional tread systems will fail.

**Ordinance Retrieval Crawler**

ORC-GI is the first generation of design and fabrication on an underwater remote operated vehicle (ROV) known as the O.R.C. This project is used to teach students the aspects of the design process and to provide a small ROV prototype that can be used to remove the threat of underwater ordnance. The requirements of the ORC is to be operational at depths of up to 100 meters, be able to operate at sea state 3, be able to fly in currents up to 3 knots, and have dimensions smaller than 122 cm long, 61 cm tall, and 61 cm wide. The last requirement is have an extremely low influence on the magnetic fields around the ORC.

**The Electrical Systems**

The crawlers electrical system and communications system uses a combination of PIC and Arduino Microcontrollers to control and relay information to the system. The communications protocol used is a standard half Duplex RS485 commination standard.