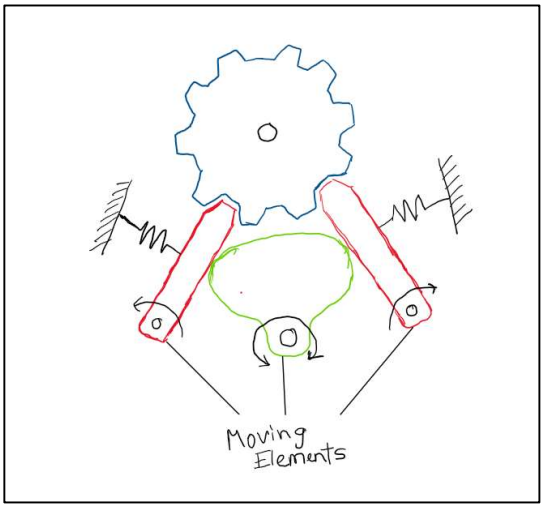
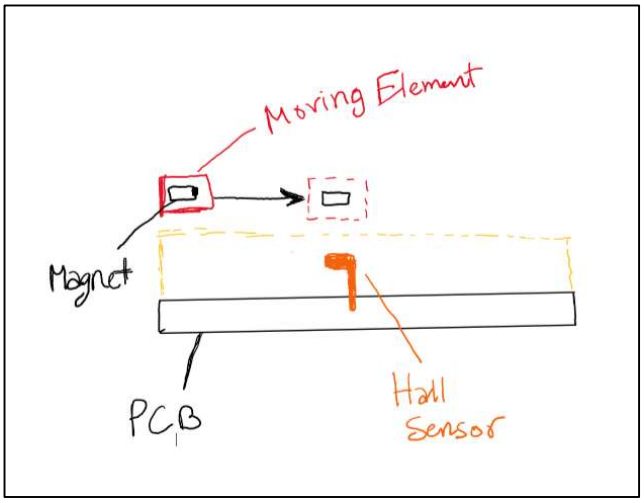
Winch PCB Design

Electrical Design, PCB Layout

Description:
This project was done for my design team, UBC Sailbot. This design team develops robotic sailboats which can make autonomous voyages across large oceanic pathways. This specific project is related to the boat's Winch system which controls the position and orientation of the sails by coiling/uncoiling rope.

The goal of this project was to design a hall-sensor based circuit board which could sense the position of 3 moving elements in the winch (Shown below). Magnets are embedded in the moving elements and the sensor PCB is placed underneath them to sense movement.





Beginning with paper designs and breadboard circuits, I tested and iterated the circuit until the desired functionality was achieved. The final PCB layout was done in Eagle CAD. The design steps and final device are shown below: