Submergible Robotic System Used to Clean Calm Bodies of Water

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The robotics and mechanical field are expected to replace humans in tedious jobs, performing research, and hazardous tasks in the near future. Oceanic cartography, deep-sea exploration, and underwater oil extraction are a few sectors that have led to the creation of an underwater vehicle that can be controlled from a distance. Remote operated vehicles (ROVs) are under the umbrella of robotics that helps humans achieve feats that they would normally not be able to accomplish. The researcher will brainstorm what challenges will need to be tackled and create a list of engineering goals. Next, the student will research to find if any ROV designs had already been created relating to the specific goals. None were found. Computerized models were created to accommodate the set challenges. Physical building led to a redesign in the ROV. Brushless DC motors were used for surge, heave, and yaw motions. Foam pool floats kept the ROV's pitch and roll levels flush. A GoPro™ Hero Session 5 was used to analyze ROV performance and document the demonstration for judging purposes. A ramp was created for getting underneath sunken pieces and acted as a spoiler. Syringes were used as a ballast tank to help with diving and surfacing. Controlled testing of the ROV came from a pool. There were 5 trails ran, 4 achieve a full success. The hypothesis was supported and all engineering challenges laid out by the student engineer were met. A pool was filled with simulated macroplastics, the ROV retrieved them all in a timely manner.

Awards Won:

Oracle Academy: Award of $5,000 for outstanding project in the systems software category.