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Computer Vision in Underwater Navigation Systems

The use of computer vision in navigation, especially navigation in underwater environments is directly dependent on the quality of the images and the ability of the computer to process them accurately. The unique conditions of underwater environments provide a particular challenge in image analysis as glare, light scattering, and particulates in the water can cause interference in pattern recognition. The computer vision system being tested focuses on navigating an underwater competition course that requires the use of path, shape and color recognition. To accomplish this, the robot is tested on a mock course, located in the university pool, which is designed to mimic the conditions found at the competition, and also tested on images obtained from the course in previous years. The algorithms used in this system heavily utilize the open source library Open CV and the code is written using C++ to minimize compatibility issues with the rest of the submarines operating platform.