

Multi-Vessel Coordinated Eye Gaze Control

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ABSTRACT

Maritime vessels, such as underwater remotely operated vehicles and surface vessels, are a popular tool to enable or enhance data collection within the scientific research communities. Utilizing multiple vessels can increase the efficiency and quantity of data collection, but current teaming methods rely on multiple operators or need to be highly constrained to reduce risk. Additionally, traditional maritime vessel controllers occupy the operator's hands which hinders switching between tasks, but eye gaze control is a promising solution. This paper introduces a mixed eye gaze control/autonomous maritime vessel team using two unmanned surface vessels (USVs) with the ultimate goal of improving the data collection process within scientific research. Past work showed effective proof-of-concept of an eye gaze controlled USV, therefore the focus within this paper is showing successful teaming of an eye gaze controlled and autonomous vessel. The system was based around ArduRover, which allowed for ArduRover's follow mode to be leveraged for the autonomous operation of the follower vessel. In-water testing showed successful operation of the eye gaze control/autonomous maritime vessel team, with areas of improvement in the follower vessel's ability to maintain its position and avoid unintended collisions.