



Performance Comparison of Sliding Mode Control and Sliding PID for Rescue ROV

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Received: July 31, 2022; Revised: October 17, 2023

Abstract: The underwater vehicle has been developed by many countries to be one kind of defense technology. This unmanned underwater vehicle is usually called the Remotely Operated Underwater Vehicle (ROV). The ROV is commonly used for underwater exploration and as a defense vehicle. The ROV can move by using six degrees of freedom (6-DOF) and requires a control system in order for the ROV to move as intended. In this paper, a controller was synthesized in the 6-DOF Evacuation ROV linear model with the Sliding Mode Control (SMC) and Sliding PID (SPID) methods. The contribution of the paper provides an analysis of numerical study and stability analysis by using the Lyapunov function for the performance of both control system methods. The focus of this paper is the comparison between the performance of SMC and SPID on the AUV linear model, of which SPID is a combination of SMC and PID. The simulation results show that the SMC and SPID methods have a good stability and small error of about 0.1% - 4%. Further, the results show that the SPID method is more stable than SMC.

Keywords: *remotely operated underwater vehicle; sliding mode control; sliding proportional integral derivative; linear model; Lyapunov function.*

Mathematics Subject Classification (2010): 93C10, 93D05.

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