

AUTONOMOUS WIRELESS UNDERWATER SURVEILLANCE VEHICLE CONTROL, HARDWARE-SOFTWARE CO-DESIGN FOR FISHERIES APPLICATIONS

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ABSTRACT

Navigation technology is considered as a fundamental problem in robotic technology. In this paper, we present hardware, software and algorithm design of a wireless control system for Autonomous Underwater Surveillance Vehicle (AUSV). We carefully designed and developed a wireless hardware control system for AUSV movement to assist fisheries operators in the collection and transmission of image data. We also developed software using C#(C-Sharp) programming language to control the movement of the AUSV. We, as well, proposed the adoption of a Hybrid Grid Map Based Genetic (HGMBG) path planning algorithm for finding an efficient optimal path in the grid map for the proposed AUSV. Extensive performance simulation results show that our control system is able to find optima path within a short time in similar environment with existing control system in almost all the simulation cases. Our system can, as well, provide an efficient and cost effective AUSV surveillance control operation consistently in a shallow water environment such as fisheries applications.

KEYWORDS: Wireless, Control System, Programming, Underwater, Surveillance, Fisheries Application