

Performance evaluation on locomotion system, body size and hull design on amphibious-based design of unmanned ground vehicle using Taguchi method

Abstract

Unmanned Ground Vehicle (UGV) is a robotic structured-based vehicle that operated on the ground but did not contain any human on board. It controlled either autonomously or remote controlled by a human operator from a distance. The operator observes the situation by using a camera that contains live feed that had been attached to the UGV. More advanced version of UGV is called "Autonomous UGV", where it controlled fully by sensors system. Thus, make this version of UGV highly reliable in replacing human for doing jobs in hazardous area or a place that is impossible for human to reach. This paper study the performance evaluation of UGV in term of their locomotion system, body size and hull design by using Taguchi method. The current UGV design under study is less flexible as it only operates on land. The objective of this study is to identify the optimal design parameters of the UGV towards amphibious functionality development. This study bridge the gap between engineering and management perspectives in reducing the time needed to perform testing on new design and reducing cost of experiment by using the Taguchi Method. The result shows that the ideal parameters design combination based on the signal-to-noise ratio calculated using the larger the better formula is the wheeled locomotion system with 350 X 250 X 200 dimension of body size and round-bottom shape of hull design.