

## A PROPOSAL OF FUZZY CONTROL SYSTEMS FOR TRAILERS DRIVEN BY MULTIPLE MOTORS IN SIDE SLIPWAYS TO HAUL OUT SHIPS

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**ABSTRACT.** *This paper describes a method of fuzzy control systems for trailers driven by multiple motors in side slipways to haul out ships. The main objective of the proposed control system is to get synchronized movements of trailers, which carry a ship in the hauling process of side slipway dry dock. A fuzzy control system is used as a key control system for compensating velocity error, rotational error and distance error, which can lead to unsynchronized motion of the trailers. Compensating forces are the outputs of fuzzy control systems and these forces are used to determine the applied forces to trailers. A simulation system is used to evaluate the performance of the control system and five different types of noises are used for testing the outputs of the control system. Finally we discuss the limitations of our proposed control system to maintain a safe process of hauling ships out and to avoid any accidents in operations.*

**Keywords:** Fuzzy control, T-S fuzzy model, Synchronized motion control, Side slipways, Shipyard