INTELLIGENT CONTROL SYSTEM DESIGN OF GUARDED MISSILE WARSHIP - KRI DIPONEGORO SIGMA CLASS TO IMPROVE MANEUVERABILITY BY MEANS OF FUZZY LOGIC METHOD

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Abstract
Existing auto-pilot system of guarded missile warship - KRI Diponegoro sigma class still uses auto-pilot control system using PID control method. It also needs maneuver control system to support the auto-pilot system in the warship. The maneuver control is determined by yaw angle (heading) as its control variable. Therefore the warship needs a safety system in the path way of ship when it activates auto-pilot mode to avoid the detected obstacle. In this research, fuzzy method is proposed to design intelligent control system in KRI Diponegoro for improving maneuverability. Inputs of fuzzy control design in maneuver system are yaw rate, error yaw and distance which is combined with fuzzy gain scheduling. The model is well verified by maneuvering trials and maneuver test to avoid the obstacle. The result shows that the designed controller can response the dangers by taking motion to avoid the obstacle in front of the warship while it is in auto-pilot system. Design fuzzy logic control only able to respond a movable obstacle which have speed 2.8 times than the speed of the warship whit a motion to avoid from the obstacle about 34.97 meters.

Keywords: Maneuver, Fuzzy Logic Control, Autopilot, Guarded Missile Warship – KRI Diponegoro