

ABSTRACT

The tuning of PID controllers of a Dynamic Positioning System used on vessels and platforms in order to maintain a fixed position in offshore or to perform a maneuver has always been a challenge to be overcome. It is a time consuming task, which depends on the environmental conditions and has a high financial cost, since the hours of dedicated qualified professional are expensive. In addition, the vessel must keep position during the period of time that the operation is performed, for example, drilling, supply or pipe launching. It was used a software to simulate the positioning of a vessel under different conditions of wind, wave and current conditions, and it was possible to verify the influence of the tuning parameters of PID controller in the control system performance. Some questions considered in this work are the non-linear behavior of the dynamic system studied and its sensibility to strong unmeasured disturbances. In this context, neural networks were designed to improve the technique used to determine the gains of the PID controllers of a Dynamic Positioning System. The best results were obtained through the performance evaluation from several simulations of neural networks that demonstrated the feasibility of implementation of automatic tuning procedures for the controllers of Dynamic Positioning System.

Keywords: PID, Neural Networks, Dynamic Positioning System.