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APPLICATION OF INTELLIGENT CONTROLLER IN A BALL AND BEAM CONTROL SYSTEM

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ABSTRACT- Ball and beam system is one of a nonlinear and unstable control system, thus providing a challenge to the control engineers and researchers. There are a number of controllers which have been studied for years that can be used to stabilize the ball and beam system. This paper investigates the performance of few different control approaches that consist of conventional controller, modern controller and intelligent controller for a ball and beam system. It will involve the derivation of the mathematical modeling that includes the linearization of the model in order to be used with the linear controllers. The works followed with designing those controllers and simulating it in MATLAB. Each controller performance will be analyzed and compared which is based on common criteria's of the step response. An appropriate graphic user interface (GUI) has been developed to view the animation of the ball and beam system.

Index terms: ball beam, modeling, PID controller, LQR controller, neural network controller