Neural network controller for two-degree-freedom helicopter control system

ABSTRACT

Now a day automatic flight control is a crucial issue especially for emergency services. One of the fittest candidates for such services is two-degree-freedom (2DOF) helicopter. Automatic control features of 2-DOF helicopter are usually approximated using the linear quadratic regulator (LQR), which can be further enhanced in-terms of Neural Network (NN). Hence, this paper presents the nonlinear flight control of 2DOF helicopter using NN. A back propagation, feed forward NN model is developer and employed to approximate the nonlinear control features of 2DOF helicopter using Matlab software. The effectiveness of the basic 2DOF helicopter NN controller is apparent (~ 2% pitch and 14% yaw improvement) compared to the conventional (LQR) methods.

Keyword: 2-DOF; Neural network