Abstract

In this paper, we explore fuzzy logic approach for lateral control of aircrafts. Here the effect of roll on yaw and that of yaw on roll is taken into account. The dynamic modeling of lateral control system that controls the lateral dynamics of an aircraft is presented. The aircraft being considered in this work is a standard NAVION Transport aircraft [1]. A suitable mathematical model to describe the dynamics of an aircraft is derived. A single fuzzy controller is designed which will control both yaw and roll of the aircraft simultaneously. In this paper the transfer functions for yaw and roll is derived and their effects on each other is taken into account so that the system will have greater accuracy and efficiency than the application of two separate controllers. This design is very cost effective and will significantly reduce instability and increases maneuverability. Simulation results for the response of lateral controller are presented in time domain. Finally, the performance of lateral control system is analyzed based on common criteria of step’s response.
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Index Terms

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