FUZZY LOGIC CONTTROLLED INDUCTION MOTOR

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ABSTRACT

In this paper different types of membership functions are used in order to control the motion of the AC induction motor. The motor controller of the induction motor is connected with the fuzzy logic controller, this fuzzy logic controller adds additional controllability over the motor and increasing the overall efficiency of the induction motor.

KEYWORDS: Membership function, fuzzy logic,

INTRODUCTION

Induction motor are now days everywhere from small home to big industries. Since the induction motor comes in variety of speed and torque characteristics hence are very popular. The induction motor provides various control over the motion of the rotor[1]. The speed and torque characteristics of the induction motor provides freedom in the movement for various tasks and functions[2].

The controller that controls the overall characteristics of the induction motor are programmed in a way so that it control the induction motor[3] as accordance with the command given by the user.

Since the conventional controller are not very efficient in controlling the motion of the induction motor, hence a new way or method is introduced in this paper that is introduction of fuzzy control with the conventional controller[4].

METHODOLOGY

There are various membership functions that are used in fuzzy logic control. Some of them are mentioned below with their figures[5].

Triangular, trapezoidal, Gaussian, two sided Gaussian, bell shaped, sigmoid right, sigmoid right, difference sigmoid, product sigmoid, polynomial z, polynomial s, and polynomial pi membership function[6].

Figure 1 shows different types of the membership functions that are tested on the controller to control the motion of the induction motor.

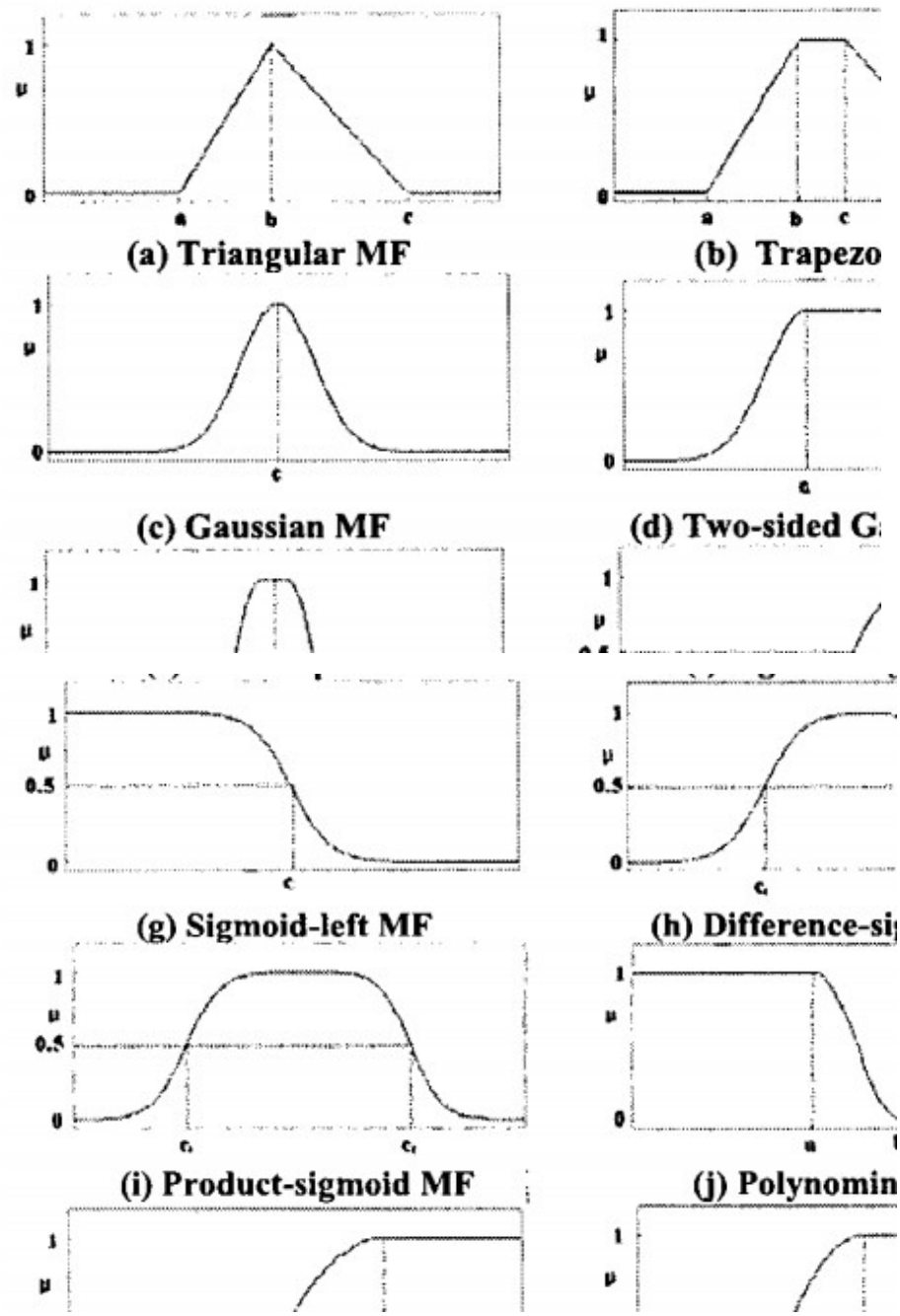

Figure 1: Member ship functions

Figure 2 shows the basic controller of the induction motor in combination with the fuzzy logic control, this controller is trained with various factors that affect the efficiency of the induction motor. The controller with the fuzzy logic control now controls the induction motor with more precise value, and increases the overall efficiency of the motor operation.

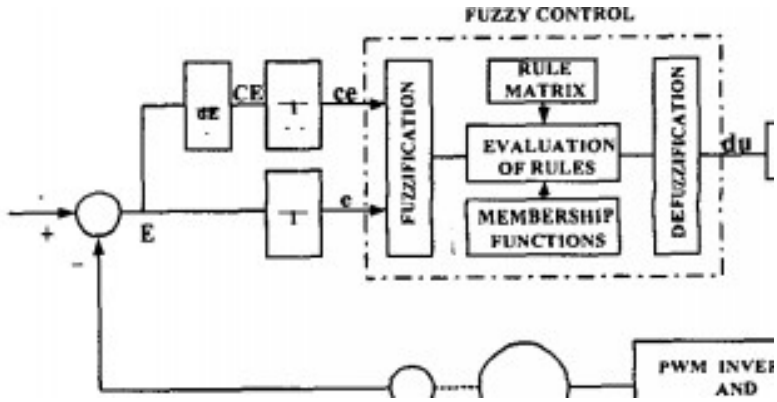

Figure 2: Basic controller with Fuzzy logic

CONCLUSION

The controller with the combination of fuzzy logic now controls the operation of the induction motor more smoothly. Thus increasing the overall efficiency of the induction motor with precise control over the speed and torque ratio. The controller with the fuzzy control changes the overall performance of the motor. The different membership functions are used in order to generate or produce an efficient control system. The membership functions produces different output with different combination.

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