CHAPTER NINE
CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions:

Indirect Field Oriented Controlled induction motor system has been introduced. The drive system was simulated using fuzzy logic controller, and its performance are compared with conventional PD, scalar, and direct operation. Simulation results showed that the performance of FLC is better than that for other types of controllers. Beside that, simulation results showed that the fuzzy logic controller is more robust during load disturbances. The drive system was simulated with fuzzy logic controller, and its performance were compared with various number of variables and shape of membership functions. Simulation results showed that the performance fuzzy controller 5*5*5 involves smaller overshoot and faster response compared to 3*3*5 and 7*7*7 .

Increasing the number of membership functions increases the complexity, and does not necessarily lead to significant improvements in the performance. An optimal minimum number of MFs should be considered while designing fuzzy controllers as long as that number achieves the control objectives. The performance of triangular MF is much better compared to that of the Gaussian MF and bell shape MF.

The use of such a dedicated DSP for motor control has reduced the hardware complexity and it has provided all functions of speed control.

9.2 Recommendations for Future Research:

The results of this thesis open some interesting and challenging problems of great importance. In what follows, we point out of possible future research directions:

- The comparison on this research focused only on using simple PD fuzzy controllers for induction motor control. The same work could be extended to be tested on adaptive fuzzy control, adaptive neuro fuzzy control, different motor control strategies, or by applying it to other process types.
- Only Triangular, Gaussian and Bell membership functions are considered for the shape. It could be possible for new work to compare the trapezoidal, polynomial-Pi, or other types of membership functions.