CHAPTER - 6
CONCLUSIONS & FUTURE SCOPE

6.1. Conclusions

The conventional method of speed control of Induction motors are now automatic, their advancements has necessiated to meet the present day situations. However the usage of the power electronic devices produces power quality problems of distortions at the output of the converters i.e., conventional inverter control fed induction motors has the same distortion outputs. This work can overcome the above problems effectively.

This work presents Conventional inverter fed three phase Induction Motor Drive with Impedance Source (Z - Source) Inverter fed Induction Motor Drive systems, which are modeled and simulated using MATLAB/SIMULINK. Next this work examines and compares the rectified output voltage, motor speed and Total harmonic distortion of conventional inverter systems for both Voltage Source Inverter (VSI), Current Source Inverter (CSI) fed three phase Induction Motor Drive with Impedance Source (Z - Source) Inverter fed system. From the analysis of results, it is observed that the rectified output voltage in Impedance Source (Z - Source) Inverter is lower than the other conventional inverters and harmonics from FFT analysis are reduced here. The simulation results are in line with the prediction.

Next the Induction motor drive system is fabricated and tested in laboratory, and the results are presented. The experimental results are in line with simulation results. Finally for the same three phase Induction Motor
Drive system the EZ-Source inverter is proposed. With that the corresponding EZ-Source fed three phase Induction Motor Drive is modeled and it is simulated using MATLAB/SIMULINK.

The results of EZ-Source inverter fed Induction Motor Drive systems are presented and these results are also compared with Z-Source inverter fed system results was done. It is observed that the ripple in the output of EZ-Source Inverter fed Induction Motor Drive system is lower than that of Impedance Source (Z-Source) Inverter fed Induction Motor Drive system. Frequency spectrum analysis (FFT) indicates that Total Harmonic Distortion (T.H.D) of EZ-Source Inverter fed Induction Motor Drive system is 1% less than that of Z-Source Inverter fed Induction Motor Drive System.

The EZ-Source Inverter fed system has advantages like Shoot-Through (ST) capability, boosting ability and reduced Total Harmonic Distortion (T.H.D) for Induction Motor Drive system. Therefore, EZ-Source Inverter fed Induction Motor Drive system is viable alternative to the existing drive systems i.e., for Z-Source & Conventional Source Inverter systems.

Latter the same proposed work (EZ-Source inverter fed three phase Induction Motor Drive) is fabricated and it is tested in the laboratory. The corresponding hardware results are presented. The experimental results coincide with the simulated results.

The contribution of this work is the development of EZ-Source Inverter fed Induction Motor Drive system with high performance.
6.2. Scope for future work

The simulation of Z Source & EZ Source inverter fed three phase Induction Motor Drive systems is done using MATLAB/SIMULINK. The simulation can also be done using PSCAD or PSIM. The hardware is implemented using micro controller. The hardware can also be implemented using DSP processor. Vector control or direct torque control may be implemented using DSP processor to control the speed of three phase Induction Motor Drive.