Chapter 5

CONCLUSION & FUTURE SCOPE

6.1 CONCLUSION

This thesis is concerned with the regulation, tracking and stabilization of nonlinear systems. Different control algorithms are designed for varied nonlinear systems. The control objective is to investigate an improved outcome in extending the formulation of control problem from using conventional approaches to optimal & intelligent control techniques.

The conventional PID controller is optimized with meta-heuristic approaches like teaching learning based optimization (TLBO) and grey wolf optimizer (GWO). These two optimization techniques validate their supremacy over the other well known conventional tuning approaches. Both the optimization techniques ensure the minimization of the performance index, selected as per the design requirements.

The optimized PID controller is designed to control the magnetic levitation system and also ensures the reference tracking with and without band-limited white noise. The GWO scheme regulates the nonminimum phase system in such a way so that the robustness properties will preserve.

The intelligent control technique like Fuzzy logic control (FLC) successfully stabilized the inverted pendulum system. The result shows the effectiveness of the FLC over Linear Quadratic Regulator and PID controller.

6.2 SCOPE FOR FUTURE WORK

There are several ways in which the research can be pursued to enhance the capability of the proposed control schemes:

- The real-time implementations of the controller can me made since the performance of the controller is designed in off-line environment.
- The nonlinear control techniques like: Feedback linearization, Back-stepping control and Sliding mode control can be used to control the nonlinear system.