Chapter 9

Conclusion and Future Scope of work

9. Conclusion & Future scope of Work

In previous chapter, various real time applications are implemented and their results are shown. By analyzing the same in details we can conclude following...

In cargo ship heading regulation problem, results of fuzzy controller shows oscillations around the changes in the desired heading. It is also shown there that this performance can also be tuned using different scalar gains g_e, g_c and g_u. This tuning of scalar gains forms the basis for the implementation of the fuzzy controller as a part of Fuzzy model reference learning controller also.

The implementation of fuzzy model reference learning controller shows improvement in tracking performance of the ship compared to PD controller, fuzzy controller and even with neural controllers. The effect of heading sensor noise and wind disturbances, which are major factor of having dynamic uncertainty in the application, is also reduced to a larger extent. Embedding evolutionary algorithm like GA for improving learning process of the fuzzy model reference controller has improved its real time performance.

For the aircraft application, fuzzy model reference controller is developed and its performance to achieve fault tolerant performance of highly nonlinear aircraft like F16, is quite significant.

Implementation of the fuzzy model reference controller using first order and second order reference model, depending upon the application is quite significant.

Embedding evolutionary algorithm for the optimal tuning of the PID gains for the Helicopter show its effectiveness in improving the real time performance of the PID controllers.

Still, evolutionary algorithms can be embedded to the fuzzy model reference learning controller for aircraft application as well as fuzzy model reference learning controller for the Helicopter application can be implemented. After the successful implementation of fuzzy model reference learning controller for Helicopter, evolutionary algorithms can embedded.