Chapter 6

Conclusion

This thesis has been investigated the problem of the robust stability for several linear systems such as linear parameter dependent (LPD) system, uncertain LPD system, uncertain linear system with nonlinear perturbation (with delay-independent or delay-dependent). We consider in the case of continuous and discrete time delay systems. We use appropriate Lyapunov functions and derived stability conditions in terms of linear matrix inequalities (LMIs). However, based on combination of the Riccati equation approach and the use of suitable Lyapunov functional, sufficient conditions for robust stability of linear non-autonomous delay systems with time-varying and norm-bounded uncertainties have been established. The conditions have been formulated in terms of the solution of curtain Riccati differential equations, which allow to compute the decay rate as well as the constant stability factor. Moreover, we have studied the problem of robust stability for uncertain impulsive switched system and uncertain impulsive switched LPD system with time-varying delays and nonlinear perturbations which are called the linear discontinuous time delay systems. By using the Lyapunov function method and linear matrix inequality (LMI) technique, sufficient conditions have been obtained. Numerical examples have been presented to illustrate the effectiveness of the theoretical results.