CHAPTER 8
Conclusion

In this thesis, we have established the following results. In Chapter 1, we have investigated the delay-dependent robust stability criteria for uncertain neutral systems with interval time-varying delays and time-varying nonlinear perturbations simultaneously. Based on Lyapunov-Krasovskii theory, new delay-dependent sufficient conditions for robust stability have been derived in terms of LMIs. The interval time-varying delay function is not required to be differentiable which allows time-delay function to be a fast time-varying function.

In Chapter 2, we have investigated the exponential stabilization of neutral-type neural networks with various activation functions and interval non-differentiable and distributed time-varying delays. The interval time-varying delay function is not necessary to be differentiable which allows time-delay function to be a fast time-varying function. By constructing a set of improved Lyapunov-Krasovskii functional combined with Leibniz-Newton's formula, the proposed stability criteria have been formulated in the form of LMIs.

In Chapter 3, we have investigated the delay-dependent robust stability criteria for uncertain neutral and Lur'e dynamical systems with sector-bounded nonlinearity. Based on Lyapunov-Krasovskii theory, new delay-dependent sufficient conditions for robust stability have been derived in terms of LMIs. The interval time-varying delay function is not required to be differentiable which allows time-delay function to be a fast time-varying function. The exponential stability for uncertain neutral and Lur'e dynamical systems with some conditions are investigated.

In chapter 4, we have investigated new delay-dependent absolute stability of Lur'e systems for neutral-type with time-varying delays. By constructing a set of improved Lyapunov-Krasovskii functional combined with a quadratic convex approach. New delay-dependent sufficient conditions for absolute stability have been derived in terms of LMIs.

In chapter 5, we have investigated the exponential stability criteria for neutral-type neural networks with time-varying discrete and neutral delays, where the discrete delay is not necessarily differentiable and the information on derivative of neutral delay is not required which allows time-delay functions to be fast

time-varying functions. By constructing a set of improved Lyapunov-Krasovskii functional combined with Leibnitz-Newton's formula, the proposed stability criteria have been formulated in the form of LMIs.