**Abstract**

This paper focuses on designing the H∞ state estimator for a class of discrete-time switched neural networks with time-varying delays, multiple missing measurements and sojourn probabilities. Measurements with missing phenomenon which is assumed to occur randomly with the missing probability are expressed by an individual random variable which satisfies the Bernoulli distribution. Sojourn probabilities, i.e., the probability of the system staying in each subsystem, are assumed to be known a priori, by which the switching law for the model is defined. By proposing a sojourn probability dependent method, the H∞ performance of the described unified model is investigated by using the sector decomposition technique. By constructing a new Lyapunov–Krasovskii functional (LKF) with triple summation terms, some sufficient conditions are established to ensure the asymptotic mean square stability of the resulting error systems. Moreover, the second order reciprocally convex technique is incorporated to deal with the partitioned double summation terms and the conditions thus obtained reduce the conservatism of the state estimator synthesis efficiently. The effectiveness of the proposed H∞ state estimator design is illustrated through numerical examples.