Event-Triggered Synchronous Iterative Learning Control for 2D T-S Fuzzy Systems Against Cooperative Attacks

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***Abstract*—This article discusses event-triggered synchronous iterative learning control (ETSILC) for 2D Takagi-Sugeno (T-S) fuzzy systems against cooperative attacks, which consist of deception attacks (DAs) and replay attacks (RAs). DA and RA, which appear randomly on the data communication channel from sensor to controller, are modeled for measurement outputs through Bernoulli process. Based on the tracking errors and synchronousness of sampled data, the appropriate ETSILC strategy is designed for 2D T-S Fuzzy Systems. Subsequently, the sufficient conditions about the robust convergence are studied in virtue of ETSILC, fuzzy and stochastic analysis technique. Finally, simulation results are given to verify the effectiveness and advantage of the proposed framework.**

Keywords—event-triggered synchronous iterative learning control, 2D Takagi-Sugeno fuzzy systems, deception attack, replay attack

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