## Fuzzy $\mathcal{H}_{\infty}$ Synchronization for Chaotic Systems with Time-Varying Delay

Choon Ki Ahn

Faculty of the Department of Automotive Engineering, Seoul National University of Science & Technology, 172 Gongneung 2-dong, Nowon-gu, Seoul 139-743, Korea

Reprint requests to C. K. A.; Fax: +82-2-979-7032, E-mail: hironaka@snut.ac.kr

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In this paper, we propose a new  $\mathcal{H}_{\infty}$  synchronization method for fuzzy model based chaotic systems with external disturbance and time-varying delay. Based on Lyapunov-Krasovskii theory, Takagi-Sugeno (TS) fuzzy model, and linear matrix inequality (LMI) approach, the  $\mathcal{H}_{\infty}$  synchronization controller is presented to not only guarantee stable synchronization but also reduce the effect of external disturbance to an  $\mathcal{H}_{\infty}$  norm constraint. The proposed controller can be obtained by solving a convex optimization problem represented by the LMI. A simulation study is presented to demonstrate the validity of the proposed approach.

*Key words:* H<sub>∞</sub> Synchronization; Chaotic Systems; Takagi-Sugeno (TS) Fuzzy Model; Lyapunov-Krasovskii Theory; Time-Varying Delay.