



Adaptive Controller with Fixed-Time Convergence for Combination Synchronization of Multiple Master and Slave Chaotic Systems

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Abstract: This paper mainly studies the fixed-time combination synchronization between different multiple chaotic systems using adaptive control. Asymptotic combination synchronization has previously been considered, but the fixed-time combination synchronisation of multiple chaotic systems with unknown parameters is the first of its kind. The fixed time control and adaptive control algorithms are successfully included to realize the combination synchronization between different multiple chaotic systems. The advantages of the proposed scheme include the possibility of realizing synchronization between almost all different chaotic systems in a short fixed time. According to the Lyapunov theory and fixed time laws, the unknown parameters are estimated and the settling time is calculated. Numerical simulation results are presented to prove the effectiveness of the proposed scheme.

Keywords: *chaotic systems; Lyapunov stability; fixed time stability; synchronization; adaptive control.*

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