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Approach to Generalized Synchronization with Application to Chaos-Based Secure Communication

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Abstract: A constructive theorem is established for generalized synchronization (GS) related to C^1 diffeomorphic transformations of unidirectionally coupled dynamical arrays. The theorem provides some interpretations about the underlying mechanism of various GS phenomena in nature. As a direct application of the theorem, a chaos-based secure Internet communication scheme is proposed. Moreover, a cellular neural network (CNN) of Chen's chaotic circuits with GS property is designed and studied. Numerical simulation shows that this Chen's CNN has high security and is fast and reliable for secure Internet communications.

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