



Moore-Spiegel Chaotic Encryption for Digital Images and Voices

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Abstract: In this study, we explore the application of the Moore-Spiegel chaotic system in both image and voice encryption, considering the increasing importance of data security in the digital age. The analysis of the chaotic system involves examining phase diagrams, time series, bifurcation diagrams, Lyapunov exponent analysis, and Poincaré maps to understand its dynamics. For image encryption, we evaluate the system's effectiveness through various analyses, including histogram analysis, correlation analysis, entropy analysis, NPCR and UACI analysis, and noise attack analysis. Similarly, for voice encryption, we assess it through various analyses, including waveform plots, FFT, spectrograms, correlation coefficients, entropy analysis, and RMSE. The findings demonstrate the suitability of the Moore-Spiegel chaotic system for both image and voice encryption, suggesting its potential as a data transmission masking technique. The research includes numerical simulations conducted using Python to support the proposed approach.

Keywords: *Moore-Spiegel chaotic system; chaotic analysis; voice encryption; masking method; image encryption; XOR method.*

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