The Efficacy of Chaotic Neural Networks for Asymmetric Encryption of Audio Files

1st Patrick Pfenning
School of Computing and Data Science
Wentworth Institute of Technology
Boston, MA
pfenningp@wit.edu

***Abstract*—This document is a model and instructions for LaTeX. This and the IEEEtran.cls file define the components of your paper [title, text, heads, etc.]. *CRITICAL: Do Not Use Symbols, Special Characters, Footnotes, or Math in Paper Title or Abstract.**

***Index Terms*—component, formatting, style, styling, insert**

I. Introduction

A. History of Encryption

B. Importance in Today's World

II. Background

A. What is Chaos?

- Chaos is statistically indistinguishable from randomness [1]
- Sensitivity to initial conditions
- Initial conditions used to build key
- ...

B. Numeric Public-Key Algorithms

- RSA
- AES
- Triple DES
- Blowfish
- Twofish
- ...

III. Literature Review

[2]–[4]

IV. Building the Network

A. Chaotic Functions

- Hénon map
- Logistic map
- Lorenz system
- Tent map
- Horseshoe map
- ...

B. Network and Diagram

Outline inputs and hidden layers here

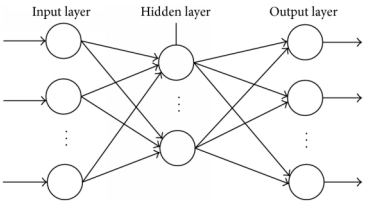

Fig. 1. Example CNN Architecture

V. Algorithm

A. Key Generation

B. Diffusion

C. Encryption

D. Decryption

E. De-Diffusion

VI. Experimentation and Results

Here we test our algorithm against several existing methods

A. Processing Time and Complexity

B. Histogram Analysis

C. Correlation Analysis

D. Peak Signal to Noise Ratio

E. Encryption Quality

F. Vulnerability to Attacks

G. Key Sensitivity

VII. Future Work

VIII. Conclusion

IX. Acknowledgments

References

[1] K. T. Alligood, T. D. Sauer, and J. A. Yorke, *Chaos*. Springer, 11 1996.
[2] S. Lokesh and M. R. Kounte, "Chaotic neural network based pseudo-random sequence generator for cryptographic applications," pp. 1–5, 10 2015.
[3] H. Hamdy and A. El-Zoghabi, "Public key cryptography based on chaotic neural network," 08 2014.
[4] V. Gujral and S. Pradhan, "Cryptography using artificial neural networks," 01 2009.