

Course: EE 494

Instructor: Dennis Hite

Primary Supervising Professor: Dr. [Aubrey Beal](#)

Secondary Supervising Professor: Dr. [Laurie Joiner](#)

Date: 11/17/2023

Entropic Signals with Hardware Fingerprints

Team Members:

Aidan Barton, Joey Beard, Ryan Carman, Seth Howard, Isaiah Mason

Abstract

We present signals generated by electronic hardware that result in distinct, digital fingerprints that are provably unique between any device. Previous efforts have attempted to use fabrication variations to achieve these fingerprints. However, few have considered the effects of these variations in chaotic systems that generate true entropic signals. Interestingly, types of chaotic systems have been shown to be solvable and consist of first order basis functions. With the combination of time-series analysis techniques and simple, closed-form solutions, we will analyze fingerprints embedded in signals made by these first order chaotic oscillators. By using electronics with fingerprints as demonstrated by these systems, the electronics supply chain can be verified, resulting in less counterfeit components.