Assessing Random Bit Generator Quality with Granger Causality Extensions

Micah A. Thornton¹, William V. Oxford², Eric C Larson³ and Mitchell A. Thornton³
¹University of Texas Southwestern Medical School (ICMC Presenter)
²Anametric, Inc.
³Darwin Deason Institute for Cyber Security, Southern Methodist University

Abstract: Numerous tests, including NIST STS and DIEHARDER test suites, have been formulated to assess RGB quality. However, these and others examine only the correlative properties present in a RGB stream. We propose the use of a new test motivated by the concept of Granger Causality, with a few additions. First, adoption of causality models based on logistic rather than linear regression, and second the addition of regularization. These additions allow testing of bitstring randomness quality.