Assessing Random Bit Generator Quality with Granger Causality Extensions

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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.