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**Bespoke Sequence of Transformations for an Enhanced Entropic Wavelet Energy Spectrum Discrepancy for Higher Efficacy Detection of Metamorphic Malware**

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**Keywords:** Industrial Control Systems; Distributed Control Systems; Operational Technology; Condition Monitoring Paradigm; Industrial Internet of Things; Metamorphic Malware.

**Abstract:** A Robust Convex Relaxation (RCR) Long Short-Term Memory (LSTM) Deep Learning Neural Network (DLNN) can provide enhanced Entropic Wavelet Energy Spectrum (EWES) discrepancy regarding the potential use of packers, crypters, and protectors (it has been found that compressed or encrypted files have greater entropy values), which can be indicative of Metamorphic Malware (MM). The RCR-LSTM DLNN facilitates a more robust Recurrent Neural Network (RNN) to Feedforward Neural Network (FNN) progression via a bespoke Nonnegative Matrix Factorization (NMF) to Multiresolution Matrix Factorization (MMF) to Continuous Wavelet Transform (CWT) Sequence of Transformations (SOT). Preliminary experimentation pertaining to the RCR-LSTM DLNN framework indicates potential higher efficacy for an enhanced EWES discrepancy than traditional Machine Learning (ML) and DLNN methods. The potential impact includes the greater use of Industrial Internet of Things (IIoT) sensors, which have been beset by MM, for Industrial Control Systems (ICS), among others.

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