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Radio Frequency Identification Encryption via Modified Two Dimensional Logistic Map

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Abstract : A modified two dimensional (2D) logistic map based on cross feedback control is proposed. This 2D map exhibits more random chaotic dynamical properties than the classic one dimensional (1D) logistic map in the statistical characteristics analysis. So it is utilized as the pseudo-random (PN) sequence generator, where the obtained real-valued PN sequence is quantized at first, then applied to radio frequency identification (RFID) communication system in this paper. This system is experimentally validated on a cortex-M₀ development board, which shows the effectiveness in key generation, the size of key space and security. At last, further cryptanalysis is studied through the test suite in the National Institute of Standards and Technology (NIST).

Keywords : chaos encryption, logistic map, pseudo-random sequence, RFID
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