

Constructing 2D Watermarks by Composition

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This study presented a method of constructing 2D periodic arrays by composing a 1D periodic array with a sequence of shifts calculated as a polynomial of order $n > 1$, $(\phi_1(x) \bmod p)$, with coefficients from Z_p . The array construction is algebraic, based on finite fields, resulting in arrays with good correlation properties. This research illustrated such method using a Legendre sequence as a base array. The resulting 2D array had a peak auto-correlation value of $p(p - 1)$ and a non-peak auto-correlation value of $-p, 0$. Finally, experimental results presented how to construct these watermarks and their resistance to 180° degree rotation, Salt, and Gaussian attacks.