HONGGANG HU, University of Waterloo

New Ternary and Quaternary Sequences with Two-Level Autocorrelation

Pseudorandom sequences with good correlation properties are widely used in communications and cryptography. The search of new sequences with two-level autocorrelation has been a very interesting problem for decades. In 2002, Gong and Golomb proposed the iterative decimation-Hadamard transform (DHT) which is an useful tool to study two-level autocorrelation sequences. They showed that for all odd $n \leq 17$, using the second-order decimation-Hadamard transform, and starting with a single binary m-sequence, all known two-level autocorrelation sequences of period $2^n - 1$ which have no subfield factorization can be obtained. Recently, we found many new ternary or quaternary sequences with two-level autocorrelation using the second-order decimation-Hadamard transform. The period of such sequences is $2^n - 1$.