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Abstract

Low autocorrelation binary sequence (LABS) detection is a classic problem in the literature. We use these sequences in many real-life applications. The detection of these sequences involves many problems. In the literature, various methods have been developed to approach the LABS issue. Based on the length of the sequence, an appropriate method can be selected and implemented. For short length sequences, linear search is possible and as the length increases we can implement various stochastic optimization algorithms. In our case that is for long binary sequences, we can use construction methods. Kristiansen and Parker [1] in their work have shown that Legendre sequences with periodic rotation can achieve a merit factor of 6.34. We have applied these Legendre sequences to steepest descent and prime step algorithms with some modifications. We call these techniques as modified Legendre algorithms. Using these improved methods we were able to achieve a merit factor of 6.4245 for long binary sequences.

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Index Terms

Computer Science

Algorithms

Keywords

Legendre sequences prime step algorithm steepest descent algorithm.