Abstract

Construction of long low autocorrelation binary sequences (LABS) is a complex process which involves many limitations. LABS have many practical applications. In pulse coding schemes, sequences with low autocorrelation side lobe energies are required to reduce the noise and to increase the capability of radars to detect multiple targets. In literature, numerous techniques were employed to solve the LABS problem. For short length sequences, search algorithms can be applied as the search space is manageable. But in our case of long length binary sequences, construction methods are suitable. The major limitations of search algorithms are time and computational power. DH Green [1] in their research utilized modified Jacobi sequences to construct merit factors for long binary sequences. In our case, we used the same construction methods and applied them to various search algorithms. We obtained better results with this implementation. We achieved a merit factor of 6.4534 whereas Green [1] managed to 5.99.

References

- D. H. Green and P. R. Green, "Modified Jacobi Sequences", IEE
- Abhisek Ukil, "Low autocorrelation binary sequences: Number theory based analysis for minimum energy level, Barker codes,"

Index Terms

Computer Science

Algorithms
Keywords

Autocorrelation  Modified Jacobi sequences  Merit Factor  prime step algorithm  steepest descent algorithm.