Abstract

Biogeography is the study of distribution of biological species, over space and time, among random habitats. Recently introduced Biogeography Based Optimization (BBO) is a technique, where solutions of the problem are termed as habitats. Feature, i.e., Suitability Index Variable (SIV), sharing among various habitats is made to occur with migration operator whereas exploration of new SIVs is done with mutation operator. Yagi-Uda antenna is a widely used antenna design due to various useful properties of high gain, low cost and ease of construction. Immigration Refusal BBO (IRBBO) is a BBO variant introduced with the objective of improved performance and faster convergence. Designing a Yagi-Uda antenna involves determination of element lengths and spacings between them to get desired radiation characteristics. The gain of Yagi-Uda antenna is difficult to optimize as there is no analytical formula to determine gain directly, it makes relationship between antenna parameters and its characteristics highly complex and non-linear. In this paper, fifteen-element Yagi-Uda antenna is optimized for maximum gain using IRBBO. The obtained results are compared with Standard BBO, Bi-Swarm optimization, Ellipsoid Algorithm and Genetic Algorithm (GA). IRBBO shows better results among other compared optimization techniques for Yagi-Uda antenna design problem.
IRBBO for Gain Maximization of Fifteen-Element Yagi-Uda Antenna

References

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Index Terms
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