Migration Effects on BBO Evolution in Optimizing Fifteen Element Yagi-Uda Antenna Design

Abstract

Biogeography Based Optimization (BBO) is a recently introduced optimization technique based on science of biogeography, i.e., study of distribution of biological species over space and time. In BBO, potential solutions of a problem are grouped in integer vectors known as habitats. Feature, i.e., Suitability Index Variable (SIV), sharing among various habitats is made to occur with migration operator where as exploration of new SIVs is done with mutation operator. Different migration variants are proposed to increase the diversity in the population, with objective of improved performance of BBO algorithm. Yagi-Uda antenna is a widely used antenna design due to various useful properties of high gain, low cost and ease of construction. Designing a Yagi-Uda antenna involves determination of element lengths and spacings between them to get desired radiation characteristics. In this paper, various migration variants of BBO algorithm, reported till date, are investigated to optimize the lengths and spacings for Yagi-Uda antenna elements for maximum gain. The results obtained with these migration variants are compared and the best results are presented in the ending sections of the paper.

References
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