Abstract

Structured-population Genetic Algorithm (GA) usually leads to more superior performance than the panmictic genetic algorithm; since it can control two opposite processes, namely exploration and exploitation in the search space. Several spatially structured-population GAs have been introduced in the literature such as cellular, patchwork, island-model, terrain-based A, graph-based, religion-based and social-based GA. All the aforementioned works did not construct the sub-populations based on the genes information of the individuals themselves. The structuring of sub-populations based on this information might help in attaining better performance and more efficient search strategy. In this paper, the structured population is represented as hierarchical hypercube of sub-populations that are dynamically constructed and adapted at search time. Each sub-population represents a sub-division of the real genes space. This structure could help in directing the search towards the promising sub-spaces. Finally, a comparative study with other known structured population GA is provided.
A Structured-Population Genetic-Algorithm based on Hierarchical Hypercube of Genes Expressions

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