

3. In addition to the aforementioned common characteristics of theoretical implementation, these common NIOAs are varied to different versions to handle different problems, including combinational optimization problems (COPs) and multi-objective optimization problems (MOOPs). Similar variant methods are adopted to improve the optimization performance of NIOAs, for example, adaptive technology, fuzzy theory, chaos theory, quantum theory and hybridization technology[21][24][25]. The individuals in the NIOAs move toward the global best solution through different mechanisms of information exchange. and ?, which have better solutions in the wolf population. Optimality.