

Effective solving of multi-objective optimization problems is a crucial issue for various areas of human activity. Notable applications of multiple criteria optimization include such diverse fields as medicine, economics, astronomy, electronic circuit design, autonomous vehicle navigation, control systems, material and chemical engineering, geological prospecting, city planning, and aerodynamics. Most of popular algorithms for multi-objective optimisation in the Pareto sense, which give high quality solutions, have high computational complexity and are difficult to realise in powerful parallel or distributed environments, which is a major issue when considering sophisticated real-world problems. The aim of this project is to develop a new multi-objective optimization problem solving model, based on Hierarchic Genetic Strategy (HGS) and Particle Swarm Optimization methods (PSO), which will both provide high quality Pareto set approximation and be easy to deploy in a distributed environment. The proposed solution is biologically inspired and can be considered as interesting alternative for popular island model of parallel evolutionary algorithms, also based on the multi-deme concept. Implementing MO-HoPSO on the basis of agent paradigm makes it a perfect foundation for further efficiency improvements and research. Evogil, a simulation platform created to satiate the project needs, provides a wide range of software tools, which can be utilised in other research projects related to multi-objective evolutionary algorithms.