Multi-objective optimal solution search based on genetic algorithms

Silvia Munteanu[1], Ana Țurcan[1], Victoria Alexei[1], Viorica Sudacevschi[1], Victor Ababii[1], Viorel Carbune[1], Dimitrie Bordian[1]

[1] Technical University of Moldova, silvia.munteanu@calc.utm.md,
https://fcim.utm.md/, ana.turcan@fcim.utm.md
victoria.alexei@iis.utm.md, viorica.sudacevschi@calc.utm.md
victor.ababii@calc.utm.md, viorel.carbune@calc.utm.md
dimitrie.bordian@scec.utm.md

The paper presents the results of research carried out to solve complex problems aimed at the efficient use of natural and energy resources. The objectives of the paper are achieved by identifying the control process based on a Multi-Agent system with distributed data processing that implements a Multi-objective optimal solution search model based on the application of a Genetic Algorithm with Collective Computation. The set of Agents presents a computational architecture that forms a structured network topology based on a P-Systems model presented in the form of a Venn diagram. The Object diagram and the Venn diagram of the P-Systems model are presented in the paper. The correctness of the developed models was verified on the basis of a control system of the artificial lighting process that provides for the minimization of energy consumption, while ensuring the quality of the lighting process.