Genetic Algorithms Based Parameter Identification of Yeast Fed-Batch Cultivation

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Different kinds of genetic algorithms have been investigated for a parameter identification of a fermentation process. Altogether eight realizations of genetic algorithms have been presented four of simple genetic algorithms and four of multi-population ones. Each of them is characterized with a different sequence of implementation of main genetic operators, namely selection, crossover and mutation. A comparison of considered eight types of genetic algorithms is presented for a parameter identification of a fed-batch cultivation of S. cerevisiae. All kinds of multi-population algorithms lead to considerable improvement of the optimization criterion value but for more computational time. Among the considered multi-population algorithms the best one has an operators sequence of crossover, mutation and selection. Different kinds of considered simple genetic algorithms lead to similar values of the optimization criterion but the genetic algorithm with an operators sequence of mutation, crossover and selection is significantly faster than the others.