Seminário em Engenharia Matemática

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Título:
Biased Random Key Genetic Algorithm Approach for Solving Unit Commitment Problem.

Resumo:

A Biased Random Key Genetic Algorithm (BRKGA) is proposed to find solutions for the unit commitment problem. In this problem, one wishes to schedule energy production on a given set of thermal generation units in order to meet energy demands at minimum cost, while satisfying a set of technological and spinning reserve constraints. In the BRKGA, solutions are encoded by using random keys, which are represented as vectors of real numbers in the interval [0,1]. The GA proposed is a variant of the random key genetic algorithm, since bias is introduced in the parent selection procedure, as well as in the crossover strategy. Tests have been performed on benchmark large-scale power systems of up to 100 units for a 24 hours period. The results obtained have shown the proposed methodology to be an effective and efficient tool for finding solutions to large-scale unit commitment problems. Furthermore, from the comparisons made it can be concluded that the results produced improve upon some of the best known solutions.