**Abstract:**

Premature convergence, which occurs due to loss of diversity, is one of the major issues in Genetic Algorithm. The adaptive probabilities of cross-over and mutation can be used to realize the twin goals of maintaining diversity in the population and sustaining the convergence capacity of the Genetic Algorithm. In this work, the Genetic Algorithm operators of cross-over and mutation are varied adaptively using the fuzzy logic approach and it has been used to reach an optimal solution for the Security Constrained Economic Dispatch problem. A comparative study has been made between Simple Genetic Algorithm and Fuzzy Genetic Algorithm on IEEE 6- bus 3-unit and IEEE 30-bus 6-unit systems. Results of comparison with other techniques are presented, showing the better computational efficiency and convergence property of the proposed approach.

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