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Design of MPSS by Search Space Logarithm Type GA Considering Mutation Rate

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Abstract: This paper presents a new genetic algorithm “Search Space Logarithm Type Genetic Algorithm Considering Mutation Rate: MSSLGA” for optimization control problems of the Multi-input Power System Stabilizer (MPSS) design. Through the MSSLGA, in general, all the search space of tuning parameters for MPSS can be presumed in the range of 0.01~100.0. First, this paper proposes developing it into the logarithm to cover the large scale disadvantage. Second, it is presented that mutation rates are decreased together gradually with the generation from the big value. The MSSLGA is possible to obtain the higher-fitness answer easily than the conventional Genetic Algorithm using a constant mutation rate. It is applied to the optimum design of MPSS using Series Compensation Method in power system, which contains low-frequency oscillations, and the efficiency through the MSSLGA is superior to conventional one.

Keywords: search space logarithm type genetic algorithm, mutation rate, series compensation method, multi-input power system stabilizer

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