Transformer Design Optimization Using Artificial Intelligence Techniques

Authors : Zakir Husain

Abstract : Main objective of a power transformer design optimization problem requires minimizing the total overall cost and/or mass of the winding and core material by satisfying all possible constraints obligatory by the standards and transformer user requirement. The constraints include appropriate limits on winding fill factor, temperature rise, efficiency, no-load current and voltage regulation. The design optimizations tasks are a constrained minimum cost and/or mass solution by optimally setting the parameters, geometry and require magnetic properties of the transformer. In this paper, present the above design problems have been formulated by using genetic algorithm (GA) and simulated annealing (SA) on the MATLAB platform. The importance of the presented approach is stems for two main features. First, proposed technique provides reliable and efficient solution for the problem of design optimization with several variables. Second, it guaranteed to obtained solution is global optimum. This paper includes a demonstration of the application of the genetic programming GP technique to transformer design.