別紙様式８

研　究　主　論　文　抄　録

論文題目　RBF ニューラルネットワークを用いた電力損失の低減と電圧モニタリング

(RBF Neural Network Based Power Loss Reduction and Voltage Monitoring)

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主論文要旨

The talks about smart grid increase rapidly and its applications have been existed in the power system, not only in terms of studies and researches but in terms of real implementations as well. Most of the recent Photovoltaic installations are good example for that. On the other hand, the existence of distributed generation (DG) units has been continuously discussed in the power distribution system area as the penetration of renewable energy sources increases rapidly. The main concern is basically how to solve the matters of proper output and location of these units inside the network following certain constraints. Nevertheless, many other concerns have been always taken into account such as CO_2 emission mitigation and economical aspects with deeper studies about stability reliability and other technical issues. According to our approach, previous works of load following operation and automatic generation control have been fulfilled to represent an important step in the field of DG penetrations and Smart grid applications. The control strategies including intelligent control such as Fuzzy logic control, were not absent at all from the past job. Mostly, the previous proposed methods intended to approach this problem using analytical methods; therefore the methods only provide single solution for their objectives. The present work provides a computational tool to assess the optimal DG output and location taking the minimum losses and enhanced voltage profile as objective functions. The method is based on an intelligent technique called Radial Basis Function (RBF) Neural Network. As it is a typical neural network and as it is only depending on the training process, RBF has a unique characteristics such as , but not limited to, it is simple in terms of algorithm and structure and it has fast computational speed and high accuracy; therefore it is flexible and reliable to be tested in different target scenarios. The total work starting from the literature review, methodology, results and ending with the conclusion is giving an advanced step to contribute in the field of smart grid applications. The proposed work of applying online intelligent techniques, namely RBF neural network to the smart grid might give promising results. Based on the results obtained in this work and using the modified RBF structure we can better focus on the demand side using this intelligent technique for a smarter grid, talking all consequences into consideration. The idea however is not limited to use a specific intelligent strategy but the door still open for further analysis, methods and contributions.