IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-6, Issue-7, July 2018 E-ISSN: 2347-2693

Reconfiguration of Distributed Network using Binary Particle Swarm Optimization Method

Manjunath Ravikumar

Dep. of Computer Science, Sri. Shivalingeshwar Government First Grade Degree College Madanhipparga, Tq.Aland, Dist. Kalaburagi, Karnataka, India

Available online at: www.ijcseonline.org

Accepted: 06/Jul/2018, Published: 31/Jul/2018

Abstract: In this paper the network reconfiguration based on the method of Binary Particle Swarm Optimization Method (BPSO). It is used to find the optimal distribution network configuration for power loss minimization. The main objective of this paper is to minimize the power loss in the network system by employing reconfiguration technique. This method is applied on 33bus system then it has been verified by BPSO. The proposed work is gives an good performance over the distributed network**.**

Keywords: BPSO, Power Loss Reduction, Reconfiguration, Distributed network**.**

I. INTRODUCTION

In the current scenario the Electricity is become the very important part of the human beings without the electricity the life of humans is miserable. The supply of electricity is become the important part of the large scale distribution systems, where the powers has to travel for far distances from the source, the sources are basically placed in the distance place from the residence areas. Since from two decades the distribution of network reconfiguration is dealing having the objective of minimize the power loss and to balance loads to improve the voltage. In the distribution network we have basically two kinds of switches those are sectionalizing switches(Closed) and tie switches. The process of reconfiguration will alter the current status of switches those switches which are change the topological structure of the system. The advantages of reconfiguration is that; it can be real power loss reduction, balancing the load of the network, voltage profile of bus improvement, the quality of power improvement, more system security, less time taken for power supply restoration and minimum undersupplied power.

II. LITERATURE SURVEY

In the reconfiguring the network in the literature work some works have been reported by using various methods, in that Dai and Sheng [1] has reported the network reconfiguration problem by combining a two-stage optimization problem, and only loaddata uncertainty was considered. Gomes and Carneiro [2] is reported an improved heuristic algorithm tofind optimal network structures. They took all weak loops into consideration at once and established a maneuvering list, then tried to open each weak loop according to the list, till the network became radial again. In [3], krill herd (KH) algorithm and its oppositional version called oppositional KH algorithm were applied to solve the optimal configuration problem in conjunction with capacitor placement. In [4], the modified bacterial foraging algorithm has been applied to optimize network configuration such that network losses are reduced. The binary particle swarm optimization (BPSO) method has been applied in [5] to determine the optimal network configuration for minimizing network losses as well as maximizing service reliability.

III. BPSO METHOD

The proposed method used the BPSO method of the PSO method, which is a velocity limited it would need to make sure the solutions which are do not fall into the local optima. This proposed work is used to reflect the mapping from particle velocity and probability should be selected, and it should ensures the result to be global optimal.

The BPSO method works on the switches the reconfiguration of distribution system, the problem lies in two states that is open or close. The binary values of 0 or 1 represents the open and close. If the value is binary 1 then it is closed otherwise 0 means open state. The states of switch is described by binary vector. The proposed method is search for the binary vector of the solution of a reconfiguration problem and this method is very well suited. As described by the B. Amanulla et.al [5] , the BPSO method is shown in the form of flowchart is given below,

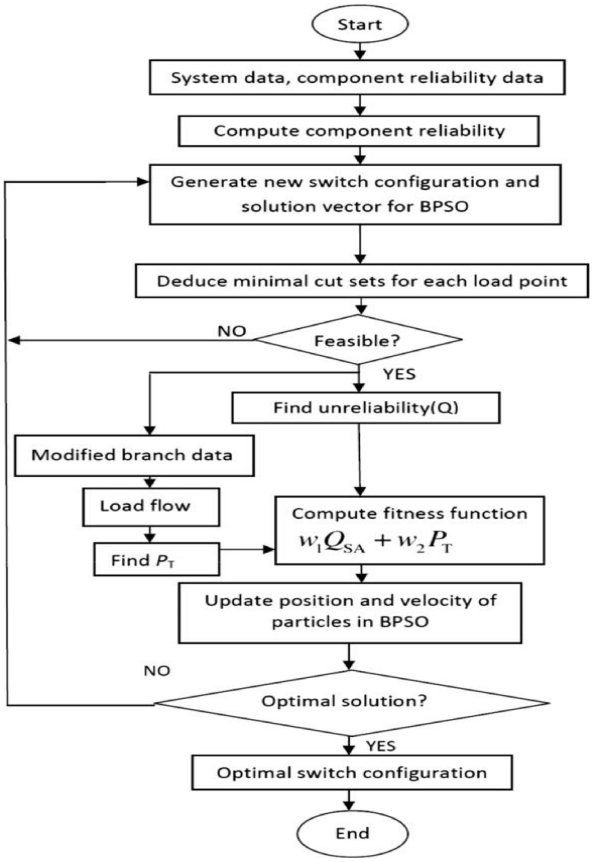

Fig. 1. Flowchart for the reconfiguration of power distribution systems[5].

To have the solution of the given problem, a various number of particles are utilized. Based on the movement of particles for the finding solution is guided by the knowledge of individual and other particles.

In the proposed method the BPSO method initially create the randomized the velocity, by loading the swarm values which contains the matrix of 2x20 dimensional matrix which treated to be the swarms. In the next zero padding for the variable sig with n=20 and dim=5, created the randomized matrix called r1 and r2 of 20x3 dimensional matrix. Set the maximum iteration of 60 to check each nodes in the network. Establish the incidence matrix. Calculate the fitness function update the velocity values in randomized values, also update particle swarm coordinate, check fitness function for each particle, Check on constraint of radial distribution network. Like this some other procedure the BPSO method is developed to simulate the 33 Bus distribution network. The following is the result for the swarm values,

3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9

3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9
3 9 4 7 9

The above values is of swarm values to obtain the optimal solution for the experiment. The tie switches are before reconfiguration are 33 34 35 36 37 and after reconfiguration 7 9 14 32 37, the power loss calculated before reconfiguration 208.4592 kW and after reconfiguration is 138.9275 kW here it is noted that the proposed method is saved 69.5317kW. The minimum voltage is used before the reconfiguration is 0.91075 pu and after reconfiguration is 0.94234 pu. The graphical representation of the proposed method is given below,

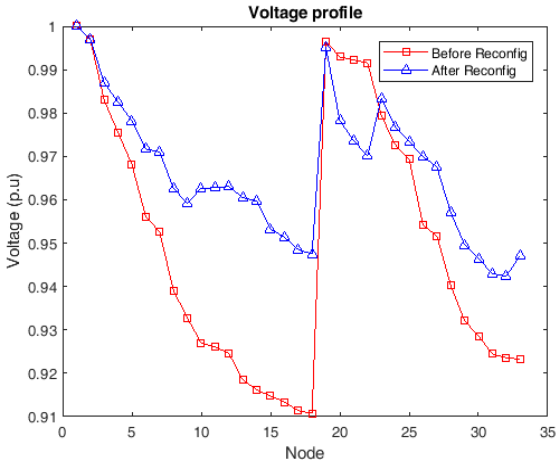

Fig 2. Voltage profile.

IV. CONCLUSION

The proposed BPSO method is given the best solution in power loss reduction it has reduced significant amount of power that is 69.5317kW after reconfigure the network. This method given the result on the base of swarms of 5x20 dimensions. In the future work it has to be increased in the dimension and the proposed method is worked for 33 bus distribution network in the future work this work extend to 64 Bus distribution network.

REFERENCES

[1] Dai, W, Sheng, W.X.,Liu, K.Y. Sheng, Y, Ye, Z.J," A novel reconfiguration method in smart distribution grid considering interval data and distributed generation. ", In Proceedings of the International Conference on Computer
Information Systems and Industrial Applications (CISIA 2015), Bangkok, Thailand,pp. 25–28, June 2015.

[2] Gomes, F.V, Carneiro, S, Pereira, J.L.R, Vinagre,.M.P, Garcia, P.A.N, Araujo, L.R. "A new heuristic reconfiguration algorithm for large distribution systems. ",*IEEE Trans. Power Syst.* , pp.1373–1378, **2005**.

[3] S. Sultana, P. Kumar Roy, "Oppositional krill herd algorithm for optimal location of capacitor with reconfiguration in radial distribution system," Electrical Power and Energy Systems, vol. 74, pp. 78–90, 2016.

[4] S. Naveen, K. Kumar, K. Raja Lakshmi, "Distribution system reconfiguration for lossminimization using modified bacterial foraging optimization algorithm," Electrical Power and Energy Systems, vol. 55, pp.128– 143, 2014.

[5]B. Amanulla, S. Chakrabarti and S. Singh "Reconfiguration of Power Distribution Systems Considering Reliability and Power Loss," IEEE Trans on Power Delivery, vol. 27, no. 2, pp. 918-926, 2012.

[6] H. L. Willis, Power Distribution Planning Reference Book, 2nd ed. New York: Mercel Dekkar, 2004

[7] M. E. Baran and F. F. Wu, "Network Reconfiguration in distribution systems for loss reduction and load balancing," *IEEE Trans. Power De.*, vol. 4, no. 2, pp. 1401–1407, Apr. 1989.

[8] S. K. Goswami and S. K. Basu, "A new algorithm for the reconfiguration of distribution feeders for loss minimization," *IEEE Trans. Power Del.*, vol. 7, no. 3, pp. 1484–1491, Jul. 1992.

[9] Pavani, P.; Singh, S.N. Reconfiguration of radial distribution networks with distributed generation for reliability improvement and loss minimization. In Proceedings of the IEEE Power Vancouver, BC, Canada, 21–25 July 2013.

[10] Prasad, K.; Ranjan, R,Sahoo, N.C, Chaturvedi, A," Optimal reconfiguration of radial distribution Systems using a fuzzy mutated genetic Algorithm",*IEEE Trans. Power Deliv*. pp. 1211– 1213, **2005.**

[11] T. Dheepak, S. Neduncheliyan, " Low Power Distributed MAC Protocol Against Various Kinds Of Attacks By Using Traffic Analysis Methodology" , IJSRCSE,pp.1-7, Jun- 2018.

[12] Rikam Palkar, Swati Chopade," An Implementation of an Vulnerability Management in Complex Networks and Defining Severity", IJSRCSE,pp.35-38, Jun-2018.

[13]Rucha Pawar, Vailshali Munguwadi, Pranav Lapsiwala," IJSRNSC, pp. 28-36, Jun-2018.

[14] Amr M. Kishk.et.al.," Proposed Jamming Removal Technique for Wireless Sensor Network",OJSRNSC,pp.1-14, Mar-2015.

Authors Profile

Manjunath Ravikumar, is currently working as a faculty in Department of Computer Science, Sri. Shivalingeshwar Government First Grade Degree College, Madanhipparga, Tq.Aland, Dist. Kalaburagi, Karnataka, India. He has received M.Sc in Computer Science from Gulbarga University Kalaburagi, Karnataka, India. Ph.D from Bundelkhand University,Jhansi, U.P. India. His area of research is Networking, Pattern Recognition and Digital Image Processing.

