- [3] Kim KH, Lee YJ, Rhee SB, Lee SK, You SK. (2002). Dispersed generator placement using fuzzy-GA in distribution systems. IEEE Summer Meeting in Power Engineering Society 1148-1153.
- [4] Karaboga D, Basturk B. (2007). Artificial bee colony (ABC) optimization algorithm for solving constrained optimization problems. International World Congress in Fuzzy Systems Association 789-798.
- [5] Ebrahimi A, Mohseni S. (2001). Multipurpose reconfiguration of distribution systems using fuzzy reasoning approach. 16th International Conference and Exhibition on Electricity Distribution. CIRED, Amsterdam. https://doi.org/10.1049/cp:20010855
- [6] Jin X, Zhao J, Sun Y, Li K, Zhang B. (2004). Distribution network reconfiguration for load balancing using binary particle swarm optimization. International Conference on Power System Technology 507-510.
- [7] Chang CF. (2008). Reconfiguration and capacitor placement for loss reduction of distribution systems by ant colony search algorithm. IEEE Transactions on Power Systems 23(4): 1747-1755. https://doi.org/10.1109/TPWRS.2008.2002169
- [8] Jin L, Qiu J. (2002). CMAC neural network based network reconfiguration for loss minimization in distribution networks. International Conference on Power System Technology 1068-1072
- [9] Hedayati H, Nabaviniaki SA, Akbarimajd A. (2008). A method for placement of DG units in distribution networks. IEEE Transactions on Power Delivery 23(3): 1620-1628. https://doi.org/10.1109/TPWRD.2007. 916106
- [10] Yammani C, Maheswarapu S, Matam S. (2012). Multiobjective optimization for optimal placement and size of dg using shuffled frog leaping algorithm. Energy Procedia 14: 990-995. https://doi.org/10.1016/j.egypro .2011.12.1044
- [11] Moradi MH, Abedini M. (2012). A combination of genetic algorithm and particle swarm optimization for optimal DG location and sizing in distribution systems. International Journal of Electrical Power and Energy Systems 34(1): 66-74. https://doi.org/10.1016/j.ijepes.2011.08.023
- [12] Borges CL, Falcao DM. (2006). Optimal distributed generation allocation for reliability, losses, and voltage improvement. International Journal of Electrical Power and Energy Systems. 28(6): 413-420. https://doi.org/10.1016/j.ijepes.2006.02.003
- [13] Celli G, Ghiani E, Mocci S, Pilo F. (2005). A multiobjective evolutionary algorithm for the sizing and siting of distributed generation IEEE Transactions on Power Systems 20(2): 750-757. https://doi.org/10.1109/TPWRS.2005.846219
- [14] Baran ME, Wu FF. (1989). Optimal sizing of capacitors placed on a radial distribution system. IEEE Transactions on Power Delivery 4(1): 735-743. https://doi.org/10.1109/61.19266
- [15] Chiang HD, Wang JC, Tong J, Darling G. (1995). Optimal capacitor placement, replacement and control in

- large-scale unbalanced distribution systems: system solution algorithms and numerical studies. IEEE transactions on Power Systems 10(1): 363-369. https://doi.org/10.1109/59.373957
- [16] Sandhya K, Laxmi AJ, Soni MP. (2013). Optimal voltage regulators placement in radial distribution system using fuzzy logic. International Journal of Application or Innovation in Engineering & Management 2(4): 331-338.
- [17] Pereira CAN, Castro CA. (2009). Optimal placement of voltage regulators in distribution systems. IEEE Bucharest Power Tech 1-5. https://doi.org/10.1109/PTC.2009.5282031
- [18] Dolli SA, Jangamshetti SH. (2012). Modelling and optimal placement of voltage regulator for a radial system. International Conference on Power, Signals, Controls and Computation 1-6. https://doi.org/10.1109/EPSCICON.2012.6175262
- [19] Moghaddas-Tafreshi SM, Mashhour E. (2009). Distributed generation modelling for power flow studies and a three-phase unbalanced power flow solution for radial distribution systems considering distributed generation. Electric Power Systems Research 79(4): 680-686, https://doi.org/10.1016/j.epsr.2008.10.003
- [20] Kashem M, Le A, Ledwich G, Negnevitsky M. (2005). Minimising power losses in distribution systems with distributed resources. IEEE Power Engineering Society General Meeting 386-391. https://doi.org/10.1109/PES.2006.1709179
- [21] Short TA. (2014). Electric power distribution handbook, CRC Press.
- [22] Kersting WH. (2009). The modeling and application of step voltage regulators. IEEE/PES Power Systems Conference and Exposition 1-8. https://doi.org/10.1109/PSCE.2009.4840004
- [23] Baran ME, Wu FF. (1989). Network reconfiguration in distribution systems for loss reduction and load balancing. IEEE Transactions on Power Delivery 4(2): 1401-1407. https://doi.org/10.1109/61.25627
- [24] Sastry K, Goldberg DE, Kendall G. (2014). Search methodologies (Chapter 4). Springer US 93-117. https://doi.org/10.1007/0-387-28356-0_4
- [25] Acharya N, Mahat P, Mithulananthan N. (2006). An analytical approach for DG allocation in primary distribution network. International Journal of Electrical Power and Energy Systems 28(10): 669-678 https://doi.org/10.1016/j.ijepes.2006.02.013

NOMENCLATURE

- V_l The secondary voltage,
- V_s The source voltage,
- a_r The ratio of voltage regulator,
- I_s The primary side current (source),
- I_L The secondary side current (output).
 - Y_{bus} The admittance matrix
- I_{DR} The current injected by DG