

Retraction

Retracted: The Network Global Optimal Mapping Approach Utilizing a Discrete Firefly Optimization Algorithm

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] H. Jia and L. Xiaomei, "The Network Global Optimal Mapping Approach Utilizing a Discrete Firefly Optimization Algorithm," *Journal of Advanced Transportation*, vol. 2022, Article ID 5486948, 7 pages, 2022.

Research Article

The Network Global Optimal Mapping Approach Utilizing a Discrete Firefly Optimization Algorithm

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The three methods, agent-based model (ABM), product life cycle management (PLM), and discrete firefly optimization algorithm (DFOA), used herein rely on local infrastructure functions after reviewing the local and global functions. Then, a resolution of the multi-layered neural network is proposed. A resolution has been saved at all levels of the structure. A global approximation function that keeps learning samples stored is employed. The local map is converted using a set having a respective free rotation. Then, the translation is reflected by a global map of each local map using the affine transformation. The differences of the conversion that the optimal global map uses by minimizing the common sensor nodes are shared by the discovery of different local maps. The optimal conversion is found by running a discrete firefly optimization algorithm (DFOA). Thus, local map registration can resolve the merged map-based approach for each of several pairs and can achieve better performance. Therefore, it provides a systematic approach to building a global map from a local map. A computer simulation was conducted to verify the performance and efficiency of the algorithm.

1. Introduction

Artificial neural networks (ANNs) have been employed to approximate high-dimensional functions based on picking a random sample. The successful outcomes of running those models have been reported in a variety of data applications such as in physical experiments, time-series data analysis, and financial and classification data analysis. However, two issues still remain unresolved, which are the construction of an approximated function at a faster speed and the adaptation of the constructed function to changing environments to obtain better results. Therefore, ANNs are generally utilized to determine approximated functions to find solutions as close to the best solution as possible.

Approximating an unknown function consists of a set of parameters. The process starts to predict each of the building blocks of the unknown function. To build any block, finding the right combination of parameters is required. By doing so, the approximate function has been constructed. However, two issues need to be resolved,

which are: how to find the best-approximated function for each block and what are the parameters that generate this function? For example, when the radial basis function is a concern, those parameters are called centers, width, and height, respectively. One of the similar types of functions must be first chosen. Besides, when a classified group has two similar functions in the radial basis feed-forward network function type, this is called an advantageous situation to construct an approximated function. However, it is better to use the global S-veils smoothing function approximation in general. Its configuration is given in Figure 1. On the other hand, the nature of the basis function must be decided when the approximation function is constructed. Then, it has been described as a novel method to automatically generate the approximated function.

Figure 1 shows the current network architecture that makes it difficult to satisfy the elasticity of the network when oscillations occur. To construct an architecture of a next-generation network, the network virtualization architecture

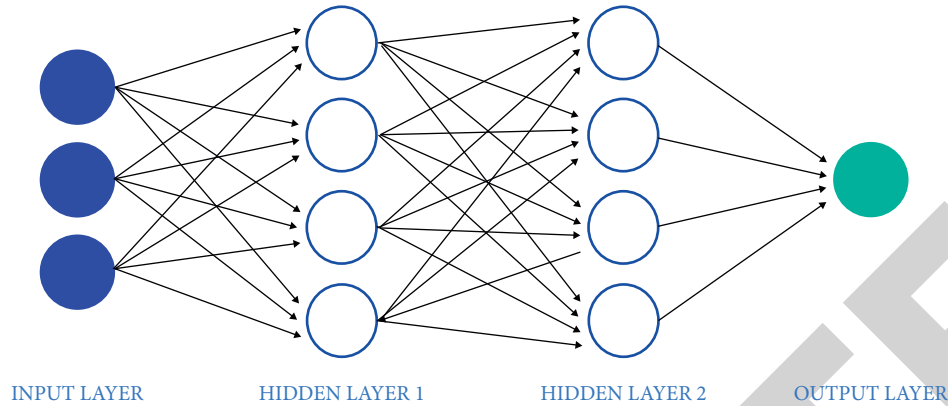


FIGURE 1: The optimal mapping of the global network.

is proposed that can use multiple networks of the common substrate as important technical support. Hence, the mapping of the virtual network is one of the examples of the virtualization network with basic content whose main purpose is to provide a virtual network with a common physical structure that is defined by a map using board nodes and link resources more efficiently.

Several challenges have existed in the mapping of the virtual network due to problems related to resource constraints, a variety of topologies, and online applications. Besides, these challenges increase the polynomial time required to find the best solution. Several types of research are devised to resolve this issue and improve the output of the physical infrastructure by aiming at constructing the mapping of the virtual network for a given problem. However, the virtual network mapping was an NP-hard problem to determine the optimal solution. Hence, a heuristic algorithm to resolve the issues for the virtual network mapping consists of three phases, which are called the node mapping stage, the virtual link stage, and the classification stage. In the classification stage of the nodes, rows of a virtual node and a physical node are constructed based on certain rules.

On the other hand, when the phase of a node mapping is a concern, using virtual nodes with a greedy optimization scheme of resource constraints meets the node mapping strategy that is constructed to a physical node. Finally, the virtual link is mapped to the underlying network via the shortest path algorithm regarding bandwidth constraints. However, the mapping stage of the conventional heuristic algorithm is completely separated from the mapping stage of the link node. Thus, it ignores the results of the sorted nodes of the physically linked map, resulting in a distribution network that allocates the high cost between the substrate and the mapping's dummy node.

The other sections of the manuscript are organized as follows: the related work summarizes the research that has been conducted regarding the examined problem in Section 2. Section 3 introduces materials and methods covering parameter range, optimization method, and network structure. Section 4 provides the results and the discussions regarding the proposed method. Section 5 concludes the research.

2. Related Work

A slice-based network is considered to resolve flexible deployment issues of the network to obtain an effective solution to provide a variety of services in the future 5G era [1]. The virtualization technology of the slice-based network divides a plurality of networks into smaller ones to meet the needs in the form of customized services of vertical industry applications with the property of an end-to-end virtual network [2]. Most of the mapping of the network resources is cut off when it comes to the mapping based on the virtual network [3]. A greedy optimization scheme is employed to construct the mapping of the virtual network [4].

Investigating the physical properties of the network topology based on the ranking is important to define the properties of the reference node that is mapped in [5]. The researchers used an algorithm that benefits from a machine-learning approach to construct a map for the virtual network in [6]. Moreover, the problem of the virtual node mapping was researched by the Monte Carlo tree search algorithm, and the Markov decision processes was proposed in [7]. Another optimization algorithm called the ant colony algorithm is used to construct unlimited physical node locations for the virtual network algorithms in [8]. Q learning and incentives mapping algorithms were used to find the best solution in the mapping algorithm in [9]. Both optimization and real-time rapid slice resources framework were proposed with its biggest network for the long-term interests in [10].

The algorithm uses the advanced architecture and its processes for both the needs of the requests and the dynamic resources of the user in real-time. The resource mapping of the network fragmentation was proposed as a deep reinforcement learning algorithm in [11]. To strengthen cooperation, actions tend to generate more revenue by testing the alternative actions. By focusing on the interaction within the environment, deep reinforcement learning was proposed as a promising solution in [12]. The depth of learning reference is used to resolve the dynamic mapping network. The prediction algorithm of slice resources to small cells is a dynamic approach to provide double-edged and several tens of footprints without exceeding the length of the sword layer.

Besides, leakage is eliminated when unloading the macro layer, particularly by increasing the deployment of the interference channel [13].

Advanced interference mitigation techniques such as coordinated multipoint transmissions were utilized to achieve higher spectral efficiency. It is also possible to reduce the cochannel interference and improve the users of the cell edges [14]. However, some of the fundamental questions pertinent to densification restrictions occurred. Thus, a term was coined to define the dense-rise in [15]. The question of how will eventually be stalled from a mapping arises. More importantly, as the abovedescribed surge continues, the density of the base station will drop to zero, which means that crashes would occur [16]. To overcome this problem, the proposed method reduces the height to the current standard height, forcing a paradigm change in [17].

Although the cochannel interference is a significant concern, the supply posture backhauls in [18]. Another challenge is related to the 5G small cellular network. For a distributed architecture with single or multiple gateways concerning the ultradense cellular network, the proposed architecture frequently reduces the cost of high-speed mobile users due to the handover in [19]. Hence, the authors concluded that the interference of the ultra-high-density 5G network is limited. In other words, the density limit means a small increase in cell density per macro-cell backhaul network capacity that will in turn reduce the system efficiency [20].

3. Proposed Method

By utilizing the recorded values of the most advantageous geolocated switching, it does not merely depend upon either position or speed. However, both of them should be employed concurrently. For instance, a simple distance threshold value can be prevented during a stay in a cell edge switch that triggers more than the cost of switching time, or the speed of the threshold might hinder a user from conducting a high-speed switch. Hence, it may move towards the epicenter of the cell. Alternatively, accessing mobile phone users' geopositioning as a choice concerning the best choice and the connection to the available trajectory. The steps of the optimization process by employing DFOA by either utilizing the global parameter mapping method or the optimum parameter method are depicted in Figure 2.

Figure 2 shows the alignment of the biomolecule network. The optimum mapping between the two nodes and the network topology is considered difficult. The outcomes, which are called false-positive and false-negative, show that such maps are more complex. Thus, the two main schemes were constructed to deal with this complication, which are called heuristic and parameter-based methods. On the other hand, heuristics are more typically used.

3.1. Range of the Global Parameter. A mapping problem of the network resource may be deducted in the hard constraint optimization problems since it is difficult for conventional resource mapping algorithms to achieve the optimal

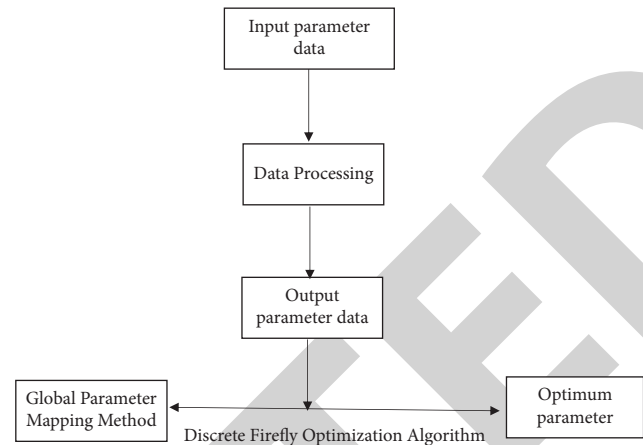


FIGURE 2: The algorithm of discrete firefly optimization.

strategy. Hence, this research presents discrete binary particles to optimize network resources by an algorithm called slice mapping. When a map of a network is constructed and the base station is determined in the slice processing, the cost function is designed concerning the resource mapping. Thus, weighting factors to reduce the linear inertia weights are employed to determine the mapping scheme that is optimized between a base station and a network unit.

3.2. Algorithm of Discrete Firefly Optimization. By using specialized traffic signals, traffic guidance is provided with the events of the intelligent transportation system. No traffic signals are designed to communicate. The ad hoc networks can inform motorists about nearby events and evacuation plans. Hence, the car telematics evacuation plan will handle and guide drivers away from the event in a coordinated manner. Another application example is related to reducing control of the overhead in the routing protocol. These routing protocols are generally established to research the entire network of nodes and the connectivity requirements of each node by using either the location query service or the messages of the broadcast. The algorithm is presented as follows:

where productivity and quality are denoted by P and Q , respectively.

Continuous maintenance for the services of the location is required. Thus, the updating mechanism deals with the issues of higher mobility rates and routing schemes. Obtaining the first destinations of these routing protocols can drive the ordinary simple technology to broadcast events such as storms and extreme weather conditions. Especially another effective mechanism is related to high-density environments that provide benefits to drivers.

3.3. Network Mapping. Many nodes could be the neighboring nodes of all nodes in the architecture that may be able to prevent replay more effectively from broadcasting messages repeatedly. For example, the technology based on the angle of the node will not rebroadcast and entirely replay if the range of the message is the same as the message

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Input: train the data in the form of  $P = \{P^{(1)}, P^{(2)} \dots P^{(K)}\}$ 
Step 1:  $DFOA \leftarrow X$ 
Step 2:  $Q = \{Q^{(1)}, Q^{(2)} \dots Q^{(K)}\}$ 
Step 3: for  $i$  1 to  $K$ , do
Step 4:  $P^{(i)} \leftarrow Q^{(i)}$ 
Step 5: when the product  $(i) = 0$ ;
Step 6: when  $x$  is aspired as a criterion
Step 7: substitute  $P$  by  $P_j, P_u, P_i$  and revise the productivity list.
Step 8: else if  $x$  is found as the best solution in a set of  $\{Q_1, Q_2 \dots Q_n\}$ 
Step 9: terminate the process.
Step 10: go back to  $Q$  in Step 2.

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ALGORITHM 1: Steps of the algorithm.

overheard in the vicinity of the coverage node for the latest broadcast. Figure 3 depicts the network mapping that provides information with users choosing different types of connection tools.

Figure 3 portrays this strategy that cannot be used for the street environment because most cars will be replayed since any wireless node's scope cannot be completely covered, even if all the neighbors broadcast messages.

4. Result and Discussion

It can also be used to reduce the range of information in communication networks, such as the cost per vehicle concerning the particular events within the radius of information. Such a message originator may be a vehicle or a roadside unit. When the street environment is a concern, technical recommendations are proposed. By referring to the rebroadcast packet from one node to another node, the whole process utilizes all the target nodes to transmit the packet data for broadcast. Thus, the radio communicates with the target node message in a wireless network of many nodes that broadcast. Table 1 shows the analysis outcome.

Each node represented by the mapping is assumed, to consist a whole set of cells. Noted that implementation is not practical when used in a small area or on the street. For example, when a large city is taken as an instance, information is recorded in cells for each unit, whose map constitutes a map of the district in gigabytes. Then, the constructed map can be accessed by several means throughout the city. One of the two most used ones is called as 1. The server gives access to be downloaded in advance and 2. The available nodes through the street can be used.

4.1. Accuracy of the Optimal Mapping. The configuration corresponding to the supply chain is employed. On the one hand, the product is designed to provide better performance. Therefore, it can be implemented in line with the needs of customers that have an optimized supply chain function.

Table 2 shows the costs of the investigation and the logistics that are accounted for by 85% or more. It is a chosen design at this stage of development. Researchers claim that more than 70% of the cost of the program is related to investigation and logistics. Therefore, supply chain

integration is a more efficient implementation, especially in the product development process, even at this early stage of the product life cycle.

Thus, Figure 4 shows ubiquitous access that cannot maintain the same mobility management methods such as guaranteed generations as before. The map of the Shijiaruili length distribution, known as a random waypoint mobility model, is analyzed for the switching rate and residence time in the two scenarios, which are called a hexagonal grid and a poise deterministic network. The trajectory followed by the activity of the user is not related to exporting all types of handover when the horizontal and vertical rates in a plurality of layers are arbitrary.

4.2. False Rate of the Optimal Mapping. Tracking users' mobility and analyzing the data are utilized to prove its correctness. Since the switching network density is to be increased and the speed of the user increases more frequently, several works have pointed out the necessity of jump switching. These strategies aim to find a smaller battery capacity and consider the balance between the interests of disconnection and punishment. Figure 5 shows the search error rate concerning the three implemented optimization methods, namely, agent-based model (ABM), product life cycle management (PLM), and discrete firefly optimization algorithm (DFOA).

4.3. Time Complexity. Since it is impossible to eliminate spam, mapping is employed to determine spam effectively. Hence, it has been the first mobile mapping since the research started. Even though the balancing of the entire mapping line is so poor, the number of products processed is increased. Flow rate state estimation, injection of active and reactive power, and voltage measurement to estimate a state may also be used by an attacker in this space, as recent studies describe the use of subversion.

Figure 6 shows the operations of the data processing based on the performance of the company by storing security tools introduced into the processing cloud. Any user of a data terminal is authenticated as a client. Thus, the data of all Yunnan clients are saved when authenticated. A location of event data and the user who benefits from it are allowed to confirm the thin deposit data processing that can

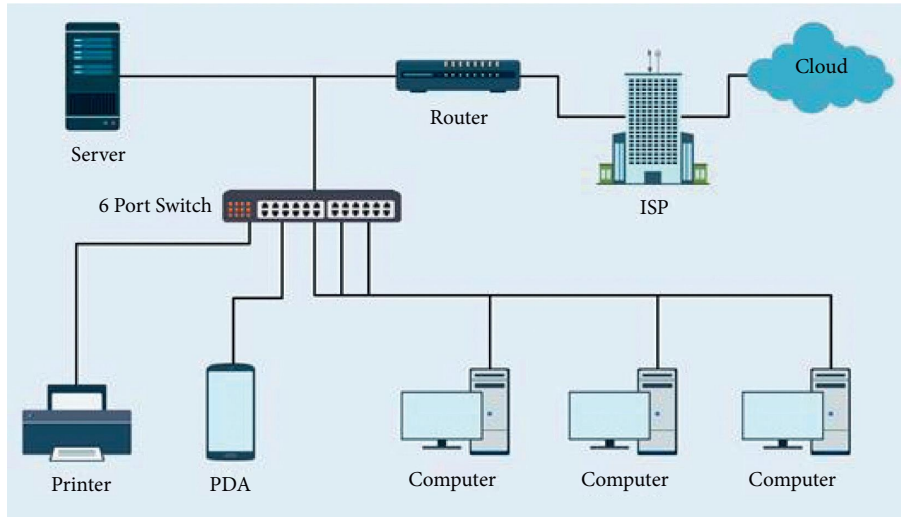


FIGURE 3: The circuit diagram of the network mapping.

TABLE 1: Analysis of the product.

Parameters	Values
Simulation tool	.Net
Transferred data	250
The size of the packet	100 MB

TABLE 2: The time complexity of the accuracies.

Accuracy (%)	ABM (%)	PLM (%)	DFOA (%)
25	30	40	47
50	45	48	62
75	50	57	79
100	67	70	85

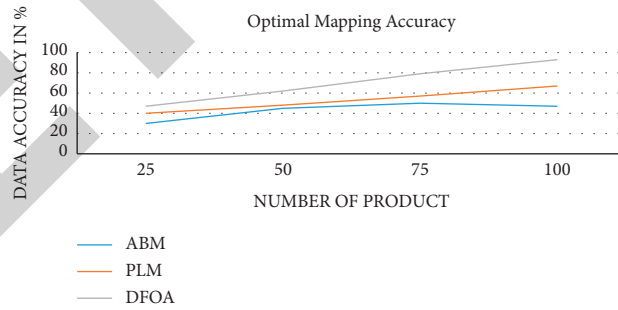


FIGURE 4: The accuracy of the optimal mapping.

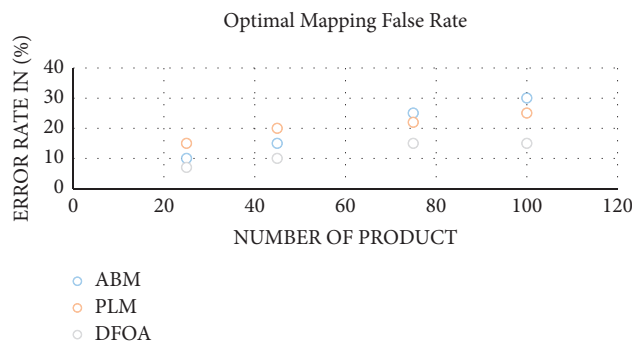


FIGURE 5: The false rate of the optimal mapping.

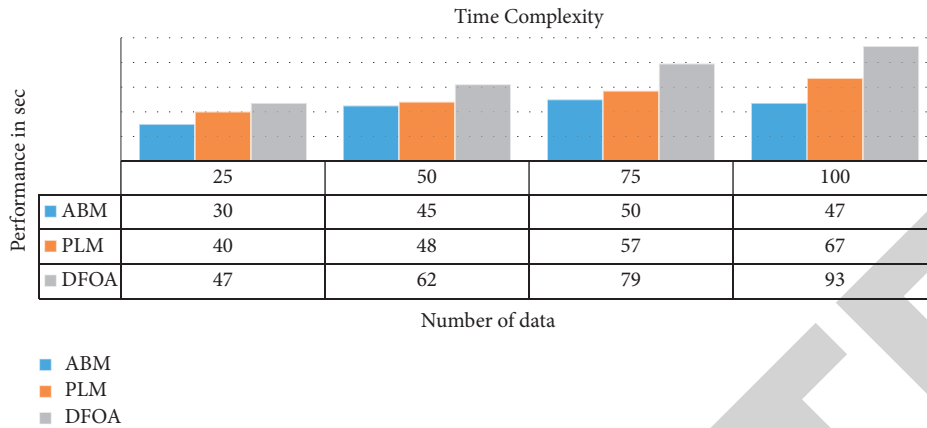


FIGURE 6: The analysis of time complexity.

be divided into two types. However, by doing so, it will increase the cost of the verification of the customer.

5. Conclusion

This manuscript investigates a resource allocation issue by proposing a multiservice broadband approximate system that is optimized by the algorithm of discrete firefly optimization based on the data source of the traffic pattern. To reduce the complexity of the calculation of the system, two approximation methods are employed. While the first one utilizes both separation and macrostate processes by assuming an isolated scheme in the mapping process, which led to the product in the form of a two-phase solution, the second one uses the multidimensional mapping approach to reduce further the state space of the problem, utilizing approximations to improve the efficiency of the system. Therefore, to maintain fairness between the two sides, an optimal resource allocation is proposed based on three optimization methods. The simulation results and analysis suggest that the approximation with sufficient accuracy for practical purposes is obtained based on the discrete firefly optimization method.

Therefore, it provides a systematic approach to building a global map from a local map. A computer simulation was conducted to verify the performance and efficiency of the algorithm.

Data Availability

The data used in this study will be provided by the author on request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] G. P. D. Gallagher, "NIST interoperability standards framework and roadmap for Smart Grid, version 1.0," *The US National Institute of Standards and Technology*, vol. 33, 2010.
- [2] P. Siano, "Demand response and smart grids-A survey," *Renewable and Sustainable Energy Reviews*, vol. 30, pp. 461–478, 2014.
- [3] Y. Wang, I. R. Pordanjani, and W. Xu, "An event-driven demand response scheme for power system security enhancement," *IEEE Transactions on Smart Grid*, vol. 2, no. 1, pp. 23–29, 2011.
- [4] L. Gelazanskas and K. A. A. Gamage, "Demand side management in smart grid: a review and proposals for future direction," *Sustainable Cities and Society*, vol. 11, pp. 22–30, 2014.
- [5] E. Nekouei, T. Alpcan, and D. Chattopadhyay, "Game-theoretic frameworks for demand response in electricity markets," *IEEE Transactions on Smart Grid*, vol. 6, no. 2, pp. 748–758, 2015.
- [6] M. M. Jalali and A. Kazemi, "The energy "DSM power suppliers and a plurality of smart grid," *From the Roll*, vol. 81, pp. 766–776, 2015.
- [7] H. K. Nguyen, J. B. Music, and Z. Han, "Smart grid demand-side management, reducing PAPR by using game theory," in *Proceedings of the IEEE International Conference on Computer Communications Symposium (INFOCOM WKSHPs)*, Orlando, FL, USA, 2012.
- [8] C. O. Adika and L. Wang, "Demand-Side bidding strategy for residential energy management in a smart grid environment," *IEEE Transactions on Smart Grid*, vol. 5, no. 4, pp. 1724–1733, 2014.
- [9] A. Zakariazadeh, O. Homaei, and P. Siano, "A new approach for real time voltage control using demand response in an automated distribution system," *Applied Energy*, vol. 117, pp. 157–166, 2014.
- [10] J. Lin, W. Yu, T. Yang, G. Xu, and W. Zhao, "Wrong in the smart grid routing distributed energy. About injection molding manufacturing data," in *Proceedings of the IEEE/ACM Minutes of the Third International Conference: Network physical system (ICCPs)*, Beijing, China, 2012.
- [11] X. Yang, J. Rin, W. Yu, P.-M. Moulema, X. Fu, and W. Zhao, "False data injection attack scenarios," *IEEE Transactions on Computer (TC) of the novel way to filter the network system, the physical network*, vol. 64, no. No 1, pp. 4–18, 2015.
- [12] Q. Qingyu Yang, J. Jie Yang, W. Wei Yu, D. Dou An, N. Nan Zhang, and W. Wei Zhao, "On false data-injection attacks against power system state estimation: modeling and countermeasures," *IEEE Transactions on Parallel and Distributed Systems*, vol. 25, no. 3, pp. 717–729, 2014.

- [13] J. S. Vardakas, N. Zorba, and C. V. Verikoukis, "A survey on demand response programs in smart grids: pricing methods and optimization algorithms," *IEEE Communications Surveys & Tutorials*, vol. 17, no. 1, pp. 152–178, 2015.
- [14] P.-Y. Chen, S. Yang, J. A. McCann, J. Lin, and X. Yang, "Detection of false data injection attacks in smart-grid systems," *IEEE Communications Magazine*, vol. 53, no. 2, pp. 206–213, 2015.
- [15] S. Gould, J. Rodgers, D. Cohen, G. Elidan, and D. Koller, "Multi-class segmentation with relative location prior," *International Journal of Computer Vision*, vol. 80, no. 3, pp. 300–316, 2008.
- [16] C. Galleguillos, A. Rabinovich, and S. Belongie, "PROC "Classification of objects using co-occurrence, position, and appearance," in *Proceedings of the IEEE Conference IEEE calculation. Vis. Figure recognition. (CVPR)*, pp. 1–8, Anchorage, AL, USA, 2008.
- [17] P. Collie, L. Ladický, and P. H. S. Thor, "Robust high forward potential to enforce label consistency," *J. Calculation. Vis.* vol. 82, no. 3, pp. 302–324, 2009.
- [18] J. M. Gonfaus, X. Boix, J. Van de Weijer, A. D. Bagdanov, J. Cellar, and J. Gonzalez, "Leveraging unlabeled data for crowd counting by learning to rank," in *Proceedings of the IEEE conference. Comp. Vis. Pattern Recog. (CVPR)*, pp. 3280–3287, Francisco, CA, USA, 2010.
- [19] L. Kang, *Street architecture landscape design based on Wireless Internet of Things and GIS system*, *Microprocessors and Microsystems*, vol. 103362, , Article ID 0141-9331, 2020.
- [20] Y. Wang and L. Shen, *Ceramic art image design based on FPGA and machine learning algorithm*, *Microprocessors and Microsystems*, vol. 103458, , Article ID 0141-9331, 2020.