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Automatic Computing Communication: A New Perspective Algorithm to Cognition for Automatic Computer Communication Systems

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Abstract: The aim of this paper was to optimize the system and the method of identifying communication systems and evaluating the scope of system communication. Algorithmic technique was used to simulate the article. The name of the data set was a Mehr Bank data set in Iran with the number of connection routes of 80 cases and the prediction of 2 models (optimal and distorted). The algorithms used included a combined neural network and genetic algorithm, support vector machine (SVM). In the results of the research, we showed that in relation to the reduction of the cases of distorted route data and the increase of optimal routes, the accuracy of detecting the routes of connection to bank users in optimal routes is increasing. Using a combined neural network and genetic algorithm, the backup vector machine improves the accuracy of detecting connection paths to bank users. By recognizing the information, the system proposed in this paper can transfer less data when transferring data with the same amount. Using two types of algorithms to explain the level of accuracy and power of algorithms in identifying and monitoring the connection paths of inter-system communication. The algorithms used included a combined neural network and genetic algorithm, support vector machine (SVM). Examination of the ability of each of the hybrid algorithms the combined neural network and genetic algorithm and support vector machine (SVM) showed that in the major items of classification and identification of interconnection pathways and their identification, the neural network and genetic hybrid algorithm is more successful. And the percentage of identification and classification of this algorithm in order to identify computer communication systems was higher than the support vector machine (SVM).

Keywords: Combined Neural Network and Genetics Algorithm, Support Vector Machine, Communication Systems, Connection Paths

1. Introduction

Identification of computer communication systems is identified as one of the main tools to investigate the types of communication routes, types of systems in the study space, and promotion of security in computer networks. An automated communication systems identification system is a program that, by analyzing current network traffic or systems analysis, tries to identify communication paths with maximum bandwidth and maximum level of communication domain, and if it detects that a new and effective system has been created. Establishes communication with that channel or, if there is a malicious system to which users are not allowed to enter the network, automatically avoids communication with it and automatically manages the communication in such a way that Reduce the level of damage to the system. [1]

Today, the development of the scope of communication between computer systems is a major issue for all networks. Identifying and preventing communication limiting factors is one of the main mechanisms in satisfying the high performance of communication systems and computer systems. [2]

One of the goals of designing and operating computer systems, along with reducing costs and increasing the speed of information exchange, is the importance of improving and optimizing the scope of information exchange communication in the system in two ways: 1. Creating mechanisms to minimize finite factors. System communication and 2-Establishing mechanisms for rapid and timely identification of system communication limiting factors, including a variety of interferences and other disorders. In this paper, the researcher intends to provide a mechanism including a multifaceted review of strategies to improve and enhance the level of communication of the system through the use of mathematical and algorithmic models. The mechanism of creating communication domain stability and improving reliability are two important factors in computer system design and implementation of optimal algorithms to prevent communication limiting factors and timely identification of communication limiting factors based on increasing stability in communication domain blocking these factors are always considered in the program. Micro is a computer system. [3-4]

In fact, the placement of optimal algorithms for identifying communication limiting factors and sites for identifying communication spaces in order to increase the reliability of the communication range of information transfer and keep them in the network, especially in points with severe or cross-sectional drop of communication range, to cover the need. Computer equipment and systems without technical planning and optimal placement lead to many technical problems. Therefore, the mechanism of identifying the limiting factors of communication. New methods such as optimal algorithms for identifying the limiting factors of communication reduce technical problems for the operation of the computer system. [5]

In this paper, the researcher in the cloud computing space intends to study the types of communication limiting factors of the system, the rate of communication limiting factors and the quality of communication limiting factors in each part of the system and with the help of limiting factor identification techniques the contact person should review and categorize them. [6]

In the present paper, it will be shown that the use of hybrid algorithms (SVM), (KNN neural fuzzy method) along with computer genealogy algorithm can provide a comprehensive intelligent systems program to increase system reliability to reduce communication limiting factors to lead.[7]

In this paper, first the effect of data is classified by SVM algorithm and used in the training steps of genetic algorithm. In this paper, first the effect of the data is classified by SVM algorithm and in the next steps the classified data is trained using the fuzzy method which can be the KNN neural fuzzy method.

This group of communication limiting factors and disorders according to the type of computer and use in the system to a variety of internal system disorders, external system disorders, factors limiting communication through organized viruses, noise and noise outside the system, the resulting disorder Noise is due to the reduction of the power of information and data transmission in the system and other cases that these disorders are classified into categories and classifiers that these categories include the limiting factors of communication within the system, categories Factors limiting communication outside the system, factors limiting viral communication are classified. This classification has two general modes that include factors limiting communication recognizable and unrecognizable by systems in the system, and in the second part to the content classification of this Disorders are actions that include areas of use, levels of communication limiting factors, frequency of communication limiting factors, volume of communication limiting factors and disruption in part or all of the system, disruptive power and level of system response to these disorders. [8-9]

In the second stage, which uses the genetic algorithm model and the KNN system, the researcher intends to establish a framework for identifying communication limiting factors by defining the types of communication limiting factors and disorders and classifying them in terms of severity and The magnitude of the disorder is based on which computers can search in the shortest time to identify communication limiting factors. In the genetic algorithm model and KNN, the relationship between parts of the system is examined based on the weighted characteristics of each part and the weaknesses of the system in terms of factors limiting the relationship to it. [10]

2. Automatic Data Mining System Classification Model and Machine Learning Technique

Automated data mining system classification model and machine learning technique is an algebraic model for displaying text documents as automated data mining system classification, which in filtering and retrieving information, indexing in the identification process of computer communication systems and their related ranking is used. Automated data mining system classification model and machine learning technique is one of the information retrieval models in which each category of information including the type and scope of computer communication systems is stored and each information system is stored as a set of data mining levels of terms. . Theoretically, these terms could be selected from the communication domain vacuum of a controlled computer. Due to the problems in providing these gaps in

computer communication domain, most terms are derived from the type and scope of computer communication systems and in order to reduce their volume, the roots of computer communication systems are used. [11]

The automated data mining system classification model and machine learning technique is one of the widely used information retrieval models [12]. In this model, each category of information — including the type and scope of stored computer communication systems and each natural language information system — is stored as a set of data mining levels of terms. [13] Theoretically, these terms could be selected from the communication domain vacuum of a controlled computer. Due to the difficulties in creating these computer communication domain gaps, terms of the type and scope of computer communication systems are derived. The root of computer communication systems is commonly used to reduce the size of computer communication domain gaps. [14] Also, disruptive computer communication systems such as,., An, of, the are often omitted. From all the computer communication systems in the documents, a set of computer communication domain gaps is created. Each document is represented as a data mining system from all the gaps in the computer communication domain. Computer communication systems that lack semantic load and are commonly found in documents are unlikely to provide important information, so these computer communication systems can be removed to speed up processing. Duplicate computer communication systems that can be ignored make up the list of unauthorized computer communication systems. Great care must be taken in removing unauthorized computer communication systems. [15]

3. Methodology

Considering the combination of genetic method and support vector machine (SVM) in order to identify computer communication systems of websites, in this article, the researcher intends to identify the type, scope and level of computer communication systems and sources of connections. Distorted, provide a template based on the method of combining genetic method and support vector machine (SVM) in order to identify and repel computer communication systems.

In this article, supervised learning, which is a type of machine learning, is used as the basic model of machine learning. Most machine learning methods use supervised learning. In supervised machine learning, the system tries to learn from the a priori examples provided. In other words, in this type of learning, the system tries to learn the patterns based on the examples given to it. Mathematically speaking, when input variable (X) and output variable (Y) are present and an algorithm can be used based on them to obtain an input-output mapping function, learning is actually monitored. The mapping function is represented as (Y = f (X). [16] The integrated model consists of a layer with an S neuron or gene, and its matrix of weights is W. This system is quite similar to Perceptron, except that instead of using the hardlim transfer function, the purelin transfer function is used.

The integrated model has a decision boundary that is obtained for wp + b = 0. The decision boundary in this integrated model is shown in the figure:

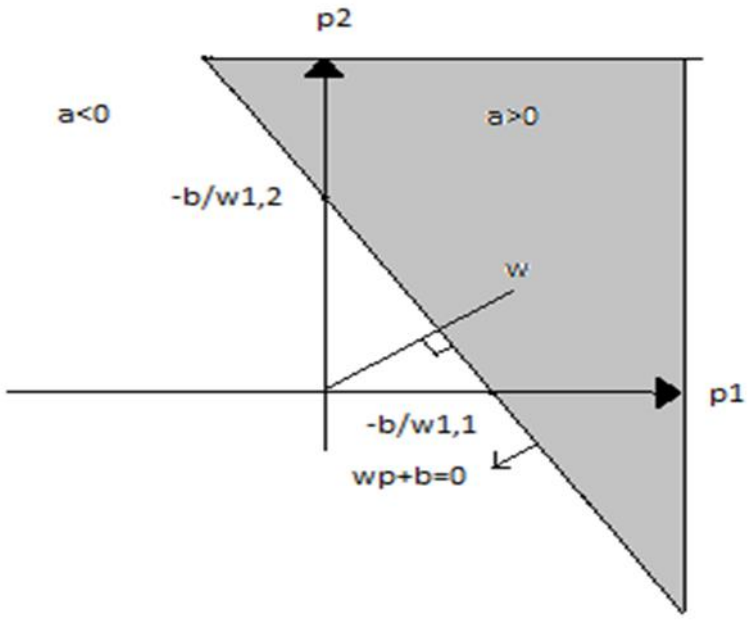


Figure 1 - Decision boundary in the integrated model

The hatched part corresponds to the output greater than zero and the non-hatched part corresponds to the output less than zero. Thus, the data is divided into two categories.

In order to run the article, the following steps are performed:

First, advanced concepts in the field of information retrieval models are examined. For this purpose, binary model and probability-based model are considered. Previous studies in the field of improving the performance of computer communication systems identification process have identified their advantages and disadvantages, and the proposed method based on the combined package formula is based on Pearson similarity criterion.

In this paper, we solve the proposed model with the considered solution methods. Due to the complexity of the calculations of this mathematical model and also due to the fact that this mathematical model is NP-HARD, we used meta-innovative algorithms to solve this model. At the beginning of this chapter, we will discuss how to define the answer string.

4. Proposed Communication System

In this paper, we create a new communication system for transferring data of bank users based on a hybrid algorithm. In the proposed communication system, the main purpose of the combined algorithm terminology is to optimize data transmission by classifying information that can only select valuable information for transmission. To achieve this, we use cognitive information based on machine learning to obtain information value. The proposed communication system architecture, which includes the device layer, the edge cloud layer, and the cloud layer, is shown in the figure. For example, we enclose communication path knowledge, optimal path data, and distorted paths as a hybrid algorithm. Data includes labeled and unlabeled data. Compared to the traditional method of discharging all data to the cloud, communication paths are detected directly in the cloud. First we identify the information and after selecting and identifying the unlabeled data, we upload the optimally valuable data to the cloud. Therefore, by knowing the information, we can understand the intelligence and reliability of the proposed system.

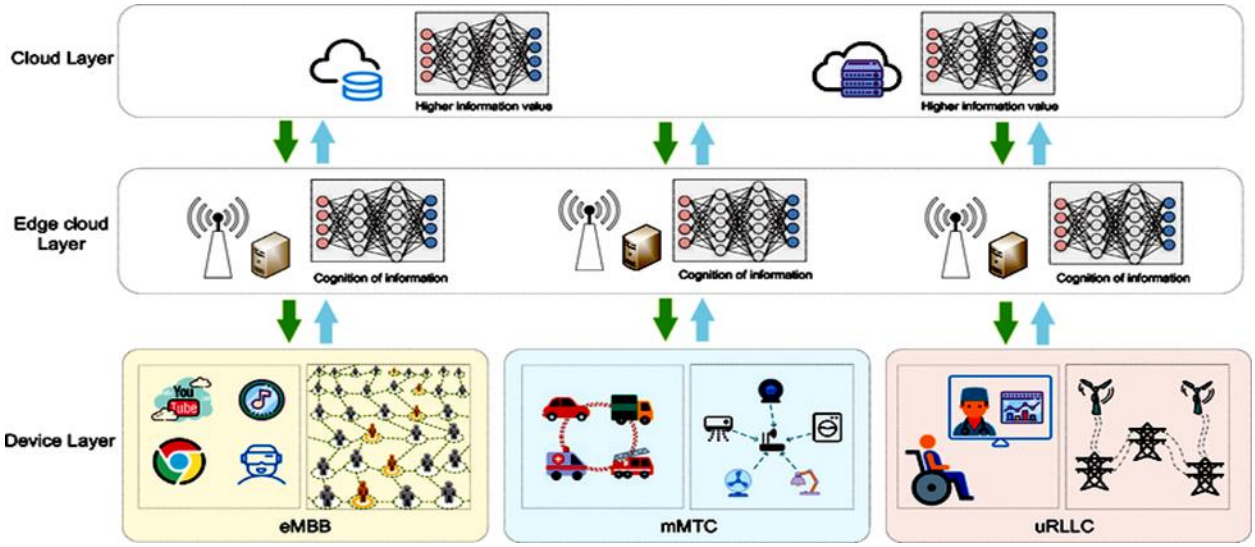


Figure 2 - Proposed communication system architecture

Below we will show how to identify user data. In traditional communication systems, all data (e.g., information) must be loaded in the cloud [17-18]. In our proposed communication system, only valuable data (after identification using machine learning) is loaded in the cloud [19]. It should be noted that in the field of identifying connection routes to bank users, the accuracy of the training model depends on the quality of data samples. In the classification problem, using the machine learning model, we can easily determine the classification reliability of a data sample. In this case, we can get the entropy of the information using the amount of confidence.

In particular, the model framework and training process are shown in the figure. To identify bank users, end users need to transfer large amounts of data to the cloud. For data, only a small portion of the data is labeled, while most data is unlabeled (ie unlabeled data) and contains a lot of noise. Therefore, we first use the backup vector architecture, which includes 5 layers of convolution, 3 layers of aggregation, and 2 layers of full connectivity to identify optimal paths connected to users based on labeled data. Second, unlabeled data is used to further improve the accuracy of the optimal route detection model connected to users. Assuming that xiu labeled unlabeled data

samples through the backup vector machine with the probability pxiu = {pxiu1, pxiu2, ⋯, pxiuc ‘, where pxiuj is the probability of classifying unmarked xiu data into optimal paths connected to users j. Therefore, we can obtain the following formula: [20]

E (pxiu) =−∑j=1cpxiujlog2pxiuj.

Where c is the number of classes. From formula (8) it can be seen that when E (pxiu) is small, the data have less predictive uncertainty. Therefore, unlabeled data is easily classified and can be more valuable for modeling training and replicating parameters. When E (pxiu) is large, the data have more predictive uncertainty, so the share of this data in the model is small. Therefore, by recognizing the data, the amount of data transfer can be reduced.

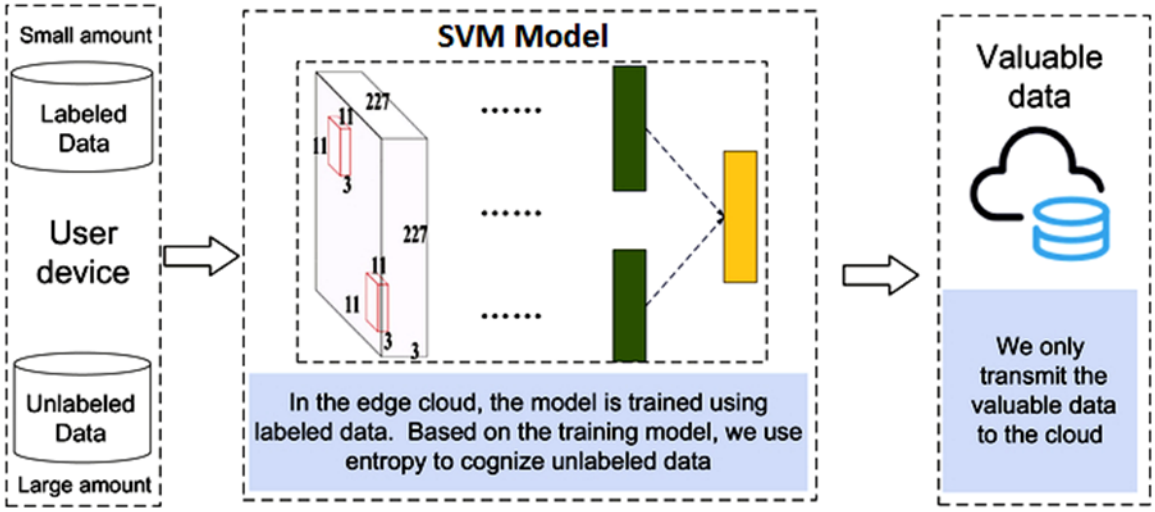


Figure 3 - Measuring the amount of information during backup vector machine training.

To increase the computational ability to identify the data, we first set the backup vector machine model on the edge cloud and transfer the labeled data to model training to obtain an immature model. Then, we select the partial data from the unlabeled data and transfer it to the cloud edge to teach the model, where we can calculate the information using entropy. Next, we set up an experiment that sets the information value threshold to decide whether to transfer unlabeled data to the remote cloud based on the amount of information calculated (if the information value is less than the threshold, The data is transferred; otherwise, the data packet is dropped) Finally, we select the unlabeled data continuously, until all user data has been evaluated. Therefore, data selection can reduce network congestion for each node in the network.

5. Data Set Specifications

Data set specifications

Predict new connection routes	Total available connection paths	Database name
*	80	Mehr Bank Dataset (Iran)

As can be seen from the table, the total of existing connection paths includes 24451 connection paths between bank ports and computer systems (personal and organizational) and based on the combined algorithm in this research, we seek to predict new connection paths. The name of the data set is Mehr Bank Dataset (Iran) and it includes the number of connections in the bank portal with 80 connections.

6. Trial Setup and Performance Evaluation

In this experiment, we enclose the expression and distorted facial expressions generated by mobile users as a hybrid algorithm, and identify the information in the edge cloud and remote cloud. In the edge cloud, the amount of data is measured with the help of user data in model accuracy and using for evaluation. Accordingly, by discarding low-density data, we transfer only the most valuable information to the cloud to teach the bank user identification model. In our experiments, we compare the cognitive information system with the traditional communication system, which transmits all information to the cloud without knowing the information transmitted. To be specific, we first compare the effect of the traditional cognitive information system and communication system on the accuracy of the model of identifying optimal paths connected to users to transmit the same amount of face data and distorted paths.

7- Using Genetic Algorithm, Support Vector Machine (SVM), Combined Neural Network Algorithm and Genetics in Identifying Computer Communication Systems through Microarray Data Analysis

In this research, genetic algorithm, support vector machine (SVM), combined neural network algorithm and genetics have been used to identify computer communication systems by analyzing microarray data.

Support Vector Machine (SVM)	Combined neural network and genetic algorithm	training	N	Total data
0.521	3	47	80	Identify all possible routes
0.958	3	73	60	Accurate detection of optimal routes connected to users
0.752	3	29	40	Accurate detection of distorted paths

In this part of reviewing and using genetic algorithm, support vector machine (SVM), combined neural network algorithm and genetics in identifying computer communication systems through microarray data analysis using MATLAB software, we provide some information. In connection with the connections, in this article, we will deal with 80 sample cases (statistical computer connections of the article. Based on the table in the following section, health information and distorted sample connections (statistical computer connections) are presented.

From the following figure (a) and (b), we see that with the decrease of data cases of distorted routes and the increase of optimal routes, the accuracy of detecting the routes of connection to bank users in optimal routes is increasing. In addition, we can clearly see that the accuracy of detecting connection paths to bank users in the cognitive information system is higher for a sample of optimal path data. The accuracy of the model refers to the ratio of the predicted data samples with the actual label to the total data samples. From the figure, we know that in the cognitive system, by recognizing unlabeled data, it can transfer large amounts of data (density, e.g., model accuracy assistance) to the cloud, using a hybrid neural network algorithm and Genetics, the backup vector machine, improves the accuracy of detecting connection routes to bank users. By recognizing the information, the system proposed in this paper can transfer less data when transferring data with the same amount.

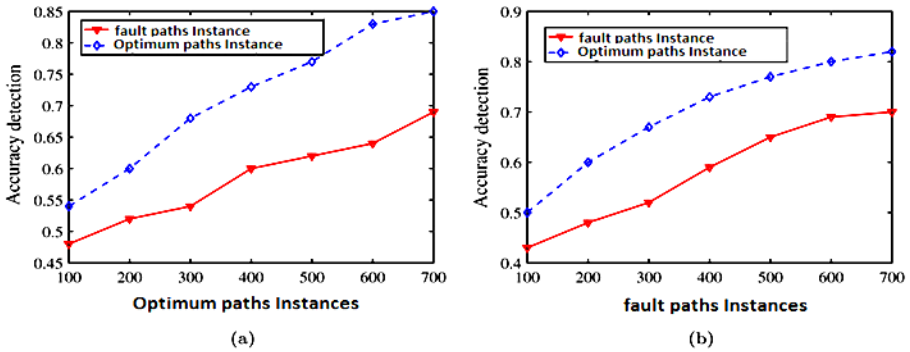


Figure 3-(a) - Accuracy of route detection based on hybrid algorithm when transferring data (b) Accuracy of route detection based on hybrid algorithm through information recognition

In the next step, we evaluate the performance of the cognitive information system in terms of diagnostic accuracy. Compared to a traditional information system, the recognition accuracy of a cognitive information system includes not only the accuracy of transmission recognition, but also the calculation of recognition accuracy in cognitive information processing.

Shows the detection accuracy of the two systems with the same accuracy of detection of optimal routes connected to users. Experimental results show that although the cognitive information system requires additional computational recognition accuracy, the total energy consumption of the cognitive information system with the same accuracy for the communication path recognition model is still less than the traditional communication system. This is mainly due to the scientific reduction in the rate of transmission of cognitive information systems in the cloud, which can lead to an overall decrease in diagnostic accuracy.

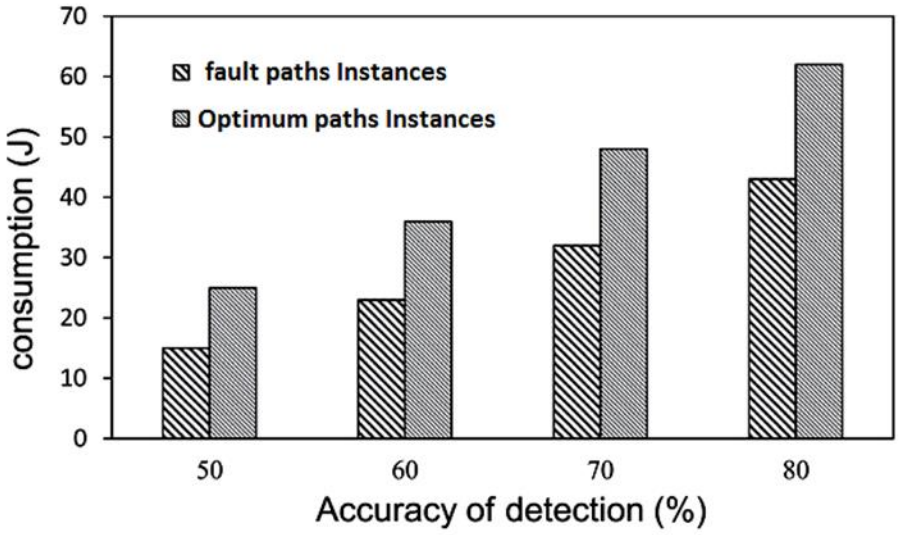
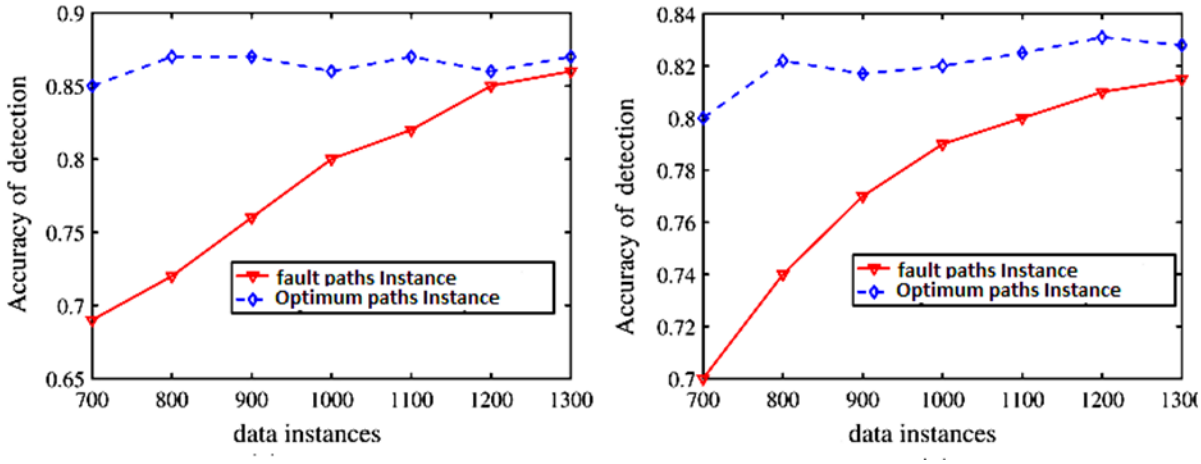


Figure 4 - Accuracy of detection versus accuracy of detection of connection routes to bank users under different communication systems

Finally, we investigate the degree of convergence of data from distorted and face paths in different communication systems. We define data convergence as the degree to which new, unlabeled data can no longer improve the accuracy of the model for identifying paths to bank users in the cloud.

The Figure 4 (a) and (b) show a comparison of the convergence of facial data and distorted paths in these two systems, respectively. We can see that although the accuracy of the two systems eventually tends to be stable, the cognitive information system tends to converge more. As soon as the value of the information is stable, the data transfer is stopped.



8- Analysis and Classification of Data Based on the Indicators of Hybrid Neural Network and Genetics Algorithm and Support Vector Machine (SVM)

- Analysis and classification of data based on the indicators of the combined neural network and genetics algorithm and support vector machine (SVM)

Backup machine vector (SVM)	Combined neural network and genetic algorithm	Total data
80/32	87/11	Identify all possible routes
59/97	65/14	Accurate detection of optimal routes connected to users
66/38	79/12	Accurate detection of distorted paths

In this section, the data were reviewed and categorized based on the indicators of a combined neural network and genetic algorithm and support vector machine (SVM). Examination of the ability of each of the hybrid algorithms the combined neural network and genetic algorithm and support vector machine (SVM) showed that in the major items of classification and identification of interconnection pathways and their identification, the neural network and genetic hybrid algorithm is more successful. And the percentage of identification and classification of this algorithm in order to identify computer communication systems was higher than the support vector machine (SVM).

9-Evaluate the Results

One of the common limiting factors among the groups of the number of broken connections per day and the type of connection routes of the bank's website in question is computer communication systems, which due to its special conditions, the identification of these broken connections always faces problems. Have been. In this paper, the researcher focuses on identifying computer communication systems in the data bank.

In the results of the research, we showed that in relation to the reduction of the cases of distorted route data and the increase of optimal routes, the accuracy of detecting the routes of connection to bank users in optimal routes is increasing. Using a combined neural network and genetic algorithm, the backup vector machine improves the accuracy of detecting connection paths to bank users. By recognizing the information, the system proposed in this paper can transfer less data when transferring data with the same amount.

As can be seen in the results, the researcher examined and used two types of algorithms to explain the level of accuracy and power of algorithms in identifying and monitoring interconnection communication paths. The algorithms used included a combined neural network and genetic algorithm, support vector machine (SVM). Examination of the ability of each of the hybrid algorithms the combined neural network and genetic algorithm and support vector machine (SVM) showed that in the major items of classification and identification of interconnection pathways and their identification, the neural network and genetic hybrid algorithm is more successful. And the percentage of identification and classification of this algorithm in order to identify computer communication systems was higher than the support vector machine (SVM).

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