Journal of Applied Science and Agriculture, 9(6) May 2014, Pages: 2672-2676

AENSI Journals

Journal of Applied Science and Agriculture

ISSN 1816-9112

Journal home page: www.aensiweb.com/jasa/index.html

Investigation of Reasons for Getting Unemployment Assurance by Different People in Social Insurance Organization

[1]Amir Rahimi, [2]Hamid Hossainpanahi, [3]Sayed Amir Sheikhahmadi, [4]Khabat Soltanian

[1]*Department of Computer Engineering, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.*
[2]*Department of Computer Engineering, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.*
[3]*Department of Computer Engineering, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.*
[4]*Department of Computer Engineering, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.*

ARTICLE INFO

Article history:
Received 28 January, 2014
Received in Revised form 16 April, 2014
Accepted 25 April 2014
Available Online 15 May, 2014

Key words:
Unemployment Assurance,
Decision Tree,
Artificial Neural Networks,
Data Mining.

ABSTRACT

Background: In recent years with considering the elements like: unjustifiable fire, completion the project, contract dissolution, disability of people, change the structure-labor ministry- seasonal workshop and ending the contract and etc. notable increasing of people tendency for getting unemployment assurance has been observed. **Objective:** In this article collect related data of unemployed people (the people who used unemployment assurance) and people that fairly had long employment and investigated with data analysis techniques. **Results and Conclusion:** Modeling of people for prediction the unemployment event of them is one of the accomplishments of article that it is possible with helping the decision tree and artificial nervous network also produced tree with C4.5way help us to obtain applied knowledge about issued problem. Furthermore the results of experiments show that the ability of decision tree for modeling those data is more than artificial Neural network.

To Cite This Article: Amir Rahimi, Hamid Hossainpanahi, Sayed Amir Sheikhahmadi, Khabat Soltanian., Investigation of Reasons for Getting Unemployment Assurance by Different People in Social Insurance Organization. ***J. Appl. Sci. & Agric.,*** *9(6): 2672-2676, 2014*

INTRODUCTION

Due to the growing unemployment in the country, and the use of unemployment insurance, social security and instability in the economic sphere, need to be examined from many Studies from different perspectives on this issue and obtain useful results, the laws of the organization, if necessary, be modified or replaced by new laws.

Statistical studies have been done in this direction, but due to the increasing amount of information from these data can be used for other purposes and knowledge of the underlying data can be extracted. This is made possible by advanced techniques of data mining.

Given that data mining results more precise than statistical methods gives us, using this method is more practical. The major data mining applications can be found in areas such as marketing (Ghazi Zahedu Amin And biabani,2013; Zeinolabedini seyede Fatemeh *et al.*,2012), economics (Darvishi Tafvizi *et al.*,2013; Jami Neyshaboori *et al.*,2012), management (Andalibi Shahram *et al.*,2013) and etc.

In this paper, we are looking to find a model by collecting information about employees and people who have used unemployment insurance in order to make a relationship between characteristics of the job seekers and Probability of being unemployed.

Therefore, in this paper, two methods were used. The first method is an evolutionary neural network is presented by Soltanian *et al* (Soltanian Khebat *et al.*2011; Muhammad Naeem Ahmed Khan *et al.*2013). The second method is classification by using decision tree (Jehad Ali *et al*.2012; N. Magesh M.E. *et al*.2013; Anuja Priyama *et al*.2013) C4.5 (Mohd. Mahmood Ali *et al*.2013; Harvinder Chauhan and Anu Chauhan, 2013). In this study, WEKA is used for testing decision trees and Evolutionary neural network method has been coded in Java.

Methods:

Structure data in spreadsheet form provided from the Social Security Organization and Administration of Cooperatives, Labor and Social Welfare. Attributes in this study consists of the set of characteristics (gender, activities, workshops, education, skills, age and unemployment) were selected and the rest of the characters as

Corresponding Author: Amir Rahimi, Department of Computer Engineering, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.

Journal of Applied Science and Agriculture, 9(6) May 2014, Pages: 2672-2676

outliers, and lead to greater complexity of the problem would have been eliminated. The decision tree method and the Evolutionary Neural Network approach have been used.

	A	B	C	D	E	F
1	Jensiat	ActivityKargah	Maharat	Tahsilat	Age	Bikari
2	1	1	2	1	3	no
3	1	2	2	1	1	no
4	1	1	2	1	1	yes
5	1	1	2	1	1	no
6	2	2	2	1	1	no
7	1	2	2	1	2	yes
8	1	2	2	1	2	yes
9	1	1	2	1	1	yes
10	1	1	2	1	3	no
11	1	1	2	1	2	yes
12	1	2	2	1	1	yes
13	1	1	2	1	2	yes
14	1	2	2	1	1	no
15	1	2	2	1	1	no
16	1	2	2	1	3	no
17	1	2	2	1	2	yes
18	1	1	2	1	1	no
19	1	1	2	1	3	yes
20	1	2	2	1	2	no
21	1	1	2	1	1	no
22	1	2	2	1	2	no
23	1	2	2	1	3	yes
24	1	1	2	1	3	no

Fig. 1: Original data encoded.

Classification using decision tree:

Decision tree classification is a standard technique (Vibha Maduskar And Y.Kelkar, 2013; Mary Slocum,2012). Decision Trees are excellent tools for helping you to choose between several courses of action. They provide a highly effective structure within which you can lay out options and investigate the possible outcomes of choosing those options. They also help you to form a balanced picture of the risks and rewards associated with each possible course of action.

C4.5 starts with large sets of cases belonging to known classes. The cases, described by any mixture of nominal and numeric properties, are scrutinized for patterns that allow the classes to be reliably discriminated. These patterns are then expressed as models, in the form of decision trees or sets of if-then rules that can be used to classify new cases, with emphasis on making the models understandable as well as accurate. The system has been applied successfully to tasks involving tens of thousands of cases described by hundreds of properties.

Cross-validation Method:

In cross-validation method (Hans C. van Houwelingen And Willi Sauerbrei,2013; Guillaume Lecué and Charles Mitchell,2012), the data set is divided into parts equal to the number of fold. Then part of data set is used as test and the other parts are used as train.

Cross-Validation is a statistical method of evaluating and comparing learning algorithms by dividing data into two segments: one used to learn or train a model and the other used to validate the model. In typical cross-validation, the training and validation sets must cross-over in successive rounds such that each data point has a chance of being validated against. The basic form of cross-validation is k-fold cross-validation. Other forms of cross-validation are special cases of k-fold cross-validation or involve repeated rounds of k-fold cross-validation.

WEKA Software:

The Waikato Environment for Knowledge Analysis (WEKA) came about through the perceived need for a unified workbench that would allow researchers easy access to state-of-the art techniques in machine learning. At the time of the project's inception in 1992, learning algorithms were available in various languages, for use on different platforms, and operated on a variety of data formats. The task of collecting together learning schemes for a comparative study on a collection of data sets was daunting at best. It was envisioned that WEKA would not only provide a toolbox of learning algorithms, but also a framework inside which researchers could implement new algorithms without having to be concerned with supporting infrastructure for data manipulation and scheme evaluation.

Nowadays, WEKA is recognized as a landmark system in data mining and machine learning. It has achieved widespread acceptance within academia and business circles, and has become a widely used tool for data mining research. The book that accompanies it is a popular textbook for data mining and is frequently cited in machine learning publications. Little, if any, of this success would have been possible if the system had not

Journal of Applied Science and Agriculture, 9(6) May 2014, Pages: 2672-2676

been released as open source software. Giving users free access to the source code has enabled a thriving community to develop and facilitated the creation of many projects that incorporate or extend WEKA.

Classification Using Evolutionary Neural Network:

An Artificial Neural Networks (ANNs) is an interconnected network of very simple calculating units called neurons. Every connection in the network is assigned a weight which specifies the extent of possible influence. The structure of the network determines how the neurons influence each other. The whole network can be represented using a directed graph where an incoming edge to a node acts like an input to a neuron and outgoing edges are outputs from the neuron.

The applications of Evolutionary Algorithms (EA) in ANNs are mostly concentrated in finding suitable network topologies and then training the network. EAs can quickly locate areas of high quality solutions when the domain is very large or complex. This is important in ANN design and training where the search space is infinite, highly dimensional and multimodal.

Result:

Classification algorithm using cross-validation method:

This algorithm is based on the cross-validation=10 that the data I s divided into 10 equal to the fold, and every time a consecutive of a fold is similar to test and also others are selected as train.

Based on made algorithm, example of laws are as below:

1- Rule. Educated people with agricultural actions were more than 4o year-old, and they has been unemployed with 90 percent possibility

2- Rule: Educated people with more than diploma degree were less than 40 year-old, and they had low proficiency and skill. Therefore they have been unemployed under 90 percent possibility, and they have utilized unemployed insurance.

3- Rule. Women who are educated and have the following education diploma .Additionally, they had public and agricultural activity, and they are also skilled in their profession as beginner and medium. Finally, they have not been unemployed under 92 percent possibility.

4- Rule. People who are educated and they have following bachelor's degree education. They are professional in industry and building workshop activity, and they are also skilled in their profession as beginner and medium. Finally, they have been unemployed under 95 percent possibility and they have used unemployed insurance.

```
J48 pruned tree
------------------

Tahsilat <= 0: No (307.0)
Tahsilat > 0
|   ActivityKargah <= 2
|   |   Maharat <= 2
|   |   |   ActivityKargah <= 1
|   |   |   |   Tahsilat <= 2: yes (143.0/7.0)
|   |   |   |   Tahsilat > 2
|   |   |   |   |   Jensiat <= 1: No (7.0/1.0)
|   |   |   |   |   Jensiat > 1: yes (3.0/1.0)
|   |   |   ActivityKargah > 1
|   |   |   |   Jensiat <= 1: No (357.0/110.0)
|   |   |   |   Jensiat > 1
|   |   |   |   |   Tahsilat <= 1: No (44.0/4.0)
|   |   |   |   |   Tahsilat > 1: yes (22.0/6.0)
|   |   Maharat > 2
|   |   |   Tahsilat <= 2: yes (1870.0/122.0)
|   |   |   Tahsilat > 2
|   |   |   |   Age <= 2: yes (204.0/36.0)
|   |   |   |   Age > 2: No (33.0/10.0)
|   ActivityKargah > 2
|   |   Age <= 2
|   |   |   Maharat <= 2
|   |   |   |   Tahsilat <= 1: No (84.0/14.0)
|   |   |   |   Tahsilat > 1: yes (6.0/1.0)
|   |   |   Maharat > 2: yes (74.0/27.0)
|   |   Age > 2: No (298.0/19.0)

Number of Leaves  :     14

Size of the tree :      27
```

Fig. 2: output of tree algorithm.

Journal of Applied Science and Agriculture, 9(6) May 2014, Pages: 2672-2676

Classification algorithm using Neural Network method:

Procedure of evolutionary nervous networks has been tested on data and its results have been revealed in this section. In this experiment, as well as algorithm test, it have been utilized cross-validation: 10 fold.

Comparing the results of the:

In Figure 2, the nervous network has been concluded for these data. As it has been shown, this network has 6 input neurons (including 5 feature of input question and baias) , 3 output neurons and a middle neurons

The input neuron, middle neurons, and output neuron respectively in the shape have been determined respectively white, gray and black.

The results of the tests according to this method for predicting not to unemployed people based on the input specifications, it has been shown 86.50 percent of accuracy.

The results of the tests indicates efficacy of data mining methods for this problem. In order to gain more knowledge about the problem that existed in the section of the decision tree test, some examples of them have been demonstrated therefore it is another reason based on efficacy of this approach for modeling the unemployment/ employment of individuals.

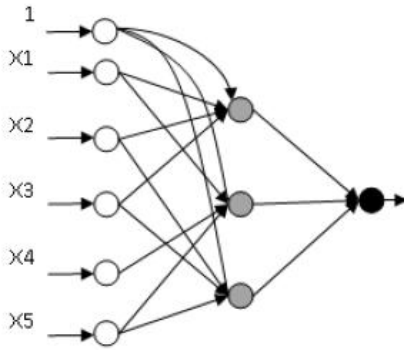

Fig. 3: Typical architecture of a neural network containing 6neurons.

Conclusion:

In this study, according to real data, the best model based on decision tree classification and evolutionary artificial nervous networks and using two software for people who have utilized unemployment insurance in social security organization. It was specified most important reasons which makes individual in the various activities to be unemployed and uses unemployment insurance, what the significant reasons are. Unemployment insurance incur a heavy financial burden on the social security Organization. In the other hand, becoming unemployed for fellows caused social damages. Using the patterns obtained from a made model, it can be classified people who insure themselves so it can be estimated possibility of becoming unemployed individuals. It will be useful and helpful for social security organization and work cooperation work and Social Welfare Bureau and Social Welfare Bureau of Sanandaj in order to legislate new laws and modify structure not to become unemployed individuals. In this regard, using the method of data mining based on information and other centers for generating patterns and exploration of crimes, infringements and etc. can be brought attention in various important and critical aspects.

REFERENCES

Andalibi, Shahram, Fazeli, Mehdi, Mehran Khosravi, 2013. "Predicting power consumption for embedded system applications using neural networks", First National Conference on Electrical and Computer southern Iran, Khormonj, University of Khormoj.

Anuja Priyama, Abhijeeta, Rahul Guptaa, AnjuRatheeb and SaurabhSrivastavab, 2013. " Comparative Analysis of Decision Tree Classification Algorithms " , aComputer science & Engineering, Kanpur institute of technology, Kanpur bLovely Professional university, Jalandhar International Journal of Current Engineering and Technology.

Darvishi Tafvizi, mansoor, Mahmoodian, Sina, Mastershod, Mohammad Saleh, 2013. "Energy efficiency of buildings using modern Data Mining", National Conference on Climate, Energy and Building, Isfahan, Iran Energy Efficiency Organization.

Ghazi Zahedu, Amin and biabani, 2013. "Determining an appropriate data mining techniques to identify customer preferences in a Customer Relationship Management System", First National Conference on Intelligent Systems Application (Soft Computing) in Science and Industry, Ghochan, Universityof Ghoochan.

Guillaume Lecué and Charles Mitchell, 2012. "Oracle inequalities for cross-validation type procedures", Electronic Journal of Statistics.

Hans, C., van Houwelingen, Willi Sauerbrei, 2013. " Cross-Validation, Shrinkage and Variable Selection in Linear Regression Revisited."

Harvinder Chauhan, Anu Chauhan, 2013. " Implementation of decision tree algorithm c5.4 " , International Journal of Scientific and Research Publications.

Jami Neyshaboori, Ansie, Attari Yoosefinejad, Mehdi, 2012. "Energy efficiency of buildings using modern Data Mining", National Conference on Climate, Energy and Building, Isfahan, Iran Energy Efficiency Organization.

Jehad Ali, Rehanullah Khan, Nasir Ahmad, Imran Maqsood, 2012. " Random Forests and Decision Trees ", IJCSI International Journal of Computer Science Issues.

Mary Slocum, 2012. " DECISION MAKING USING ID3 ALGORITHM " , RIVIER ACADEMIC JOURNAL.

Mohd. Mahmood Ali, Mohd. S. Qaseem, Lakshmi Rajamani, A. Govardhan, 2013. "”EXTRACTING USEFUL RULES THROUGH IMPROVED DECISION TREE INDUCTION USING INFORMATION ENTROPY " , International Journal of Information Sciences and Techniques (IJIST).

Muhammad Naeem Ahmed Khan, Sheraz Ahmed Qureshi and NaveedRiaz, 2013. " Gender Calssification with Decision Trees" , International Journal of Signal Processing.

Magesh, N., M.E. Dr. P. Thangaraj Ph D.S. Sivagobika, S. Praba, R. MohanaPriya, 2013. "Evaluating The Performance Of An Employee Using Decision Tree Algorithm " , International Journal of Engineering Research & Technology (IJERT).

Soltanian, Khebat, Ahmadizar, Fardin, Fardin Akhlaghian Tab, 2011. "Designing and Training Artificial Neural Networks Using Evolutionary Strategies", First National Conference on Computer and Information Technology Scholars, Tabriz University, Tabriz.

Vibha Maduskar, Y., Kelkar, 2013. "A New Modified Decision Tree Algorithm based on ID3" , International Journal of Computer Architecture and Mobility.

Zeinolabedini, seyede Fatemeh, Khan Babaei,Mohammad, Mahdavi, Mehrgan, 2012. "Segmentation and recognition of electronic banking services to customers based on data mining and RFM techniques" Case Study: Development Institute, Conference on Software Engineering, Islamic Azad University, Lahijan Branch.