POLITICAL AND SOCIOLOGICAL PROGNOSTICATION WITH USE OF ARTIFICIAL INTELLECT

Sholari Evgheni

Technical University of Moldova, Stefan cel Mare Av, 168, Chisinau

MD2012, Republic of MOLDOVA. E-mail: fuego@front.ru

Annotation: In the work the essence problem of prognostication, and also an opportunity of use of neural networks in political and sociological prognostication is examined. Also the traditional methods applied in political and sociological prognostication, based on laws of mathematical statistics and mathematical modeling are in detail examined. Lacks of such approach and the complexities connected with its realization are analyzed. The substantiation of expediency of application of neural network approach in the solution of the broad range of the problems connected with political and sociological prognostication is given. Opportunities of use of systems of an artificial intellect for prognostication of parliamentary elections results in Republic Moldova are in detail investigated.

INTRODUCTION

The analysis and prognostication are an integral part of modern sociology and political science. More and more increasing sociological funds, the analytical centers, parties, the organizations take on arms modern software. On its basis it is possible to receive operatively the necessary analytical information, to predict, optimize existing processes and to do many other things.

The modern life, including, sociopolitical, is very dynamical, therefore speed of decision-making and their accuracy get huge value. For this purpose KNOWLEDGE is necessary. In a basis of knowledge extraction technology from all volume of available information lays the mathematical device, earlier used only in narrow fields by high-class experts. But the time passes, and now technologies of the analysis and prognostication become much more accessible and are used for the solution of daily problems in the most various fields of life, including sociology and political science.

Prognostication - one of the most demanded, but thus the most complex, term of the analysis. Problems at its solution are caused by many reasons - insufficient quality and quantity of initial data, changes of environment in which the process proceeds, influence of subjective factors. But the qualitative prognostication is a key to the solution of many problems that faces social sciences.

The use of neural networks as the most perspective way of political behavior prognostication is represented. Neural networks - the powerful mechanism of the analysis of data that is successfully used for the solution of problems of classification and the prognostication for multifactor processes to which processes political concern also.

From well-known advantages of the neural network approach it is necessary to point out also one more, the most attractive in it - absence of necessity for the strict mathematical specification of model that is especially valuable at the analysis of badly formalizable processes. And the majority of problems of sociology and political science are badly formalized. It means that at presence of enough developed and convenient software tools the user can be guided at construction of predicted process model by such concepts, as experience and intuition. Besides such modeling is useful also for that it allows to see the deep uniformity of the phenomena which at first sight have no among themselves anything common.

In the given work the problem of political and sociological prognostication, on an example of the prognostication of parliamentary elections results with the use of an artificial intellect system, is examined.

EXPERIMENTAL

As a basis for training a network, are used data of the previous parliamentary elections 1998, 2001 and 2005, namely dependence of elections results of each party on such factors, as activity of mass-media (the analysis of mass media loyalty in relation to one or other party), the basic pre-election pledges of competitors (elements of an electoral programme on corresponding segments are used: "economy", "policy", "foreign policy", etc.), results of polls (ratings of leaders of political formations), etc.

Thus, sample of the meaning factors maximal number, from available initial data, is made. It means as well a choice of supervision interval (depth of immersing), that is, by what quantity of previous values the prognostication is made and definition of the additional factors, influencing behavior of the predicted size.

Further, from entrance data insignificant and seldom meeting factors are eliminated. Optimization of data was spent with use of Cohonen cards which allow projection of a multivariate entrance vector on a two-dimensional plane.

A following step is a neural network model construction - training of a neural network. On this step a number of specific subtasks are solved: a choice of structure of a neural network, algorithm of training and other. On the basis of constructed neural network models prognostication is carried out.

Prognostication is carried out with use of software package Deductor 4.0, providing the whole cycle of operations over the data, beginning with extraction and data preparation process and finishing with construction of neural network models.

At a choose of a network architecture, by means of which the prognostication is carried out, the most popular investigated, for the given range of problems, algorithms Back Propagation and Resilent Propagation. Search of optimum architecture of a network that gives the minimal mistake of prognostication after training, will conclude in search of network neurons quantity and steepness of sigmoid.

RESULTS AND DISCUSSION

After training the neural network is capable to give the prognostication of any party results on parliamentary elections of 2009 at observance of the entrance data structure, collected for this party before corresponding elections. On that condition, the system is capable to give the prognostication for any party, including new (not participated in the previous elections) and even to an "abstract" party.

Analyzing results of neural network training is necessary to note, that the network distinguishes test set with a number of mistakes that inevitably affects quality of the prognostication.

CONCLUSIONS

Getting the high-quality prognostication by means of such model is hardly possible in view of a plenty assumptions made during modeling. However, it does not mean that neural networks cannot successfully solve a faced task. It is possible to explain the low quality of research result by the data insufficiency. For improvement of quality of the prognostication, thus, it is necessary to add the analyzed information with the additional data.

Also, as the factor, which has negatively affected result of prognostication; it is possible to specify that during creation of the interface between political model and an artificial intellect system, entrance data were coded in a binary kind what not always is correctly distinguished by the program. Frequently the program distinguishes such entrance values as values from a floating comma that deforms sense of coding and leads to incorrect result.

One more negative factor, weak optimization of sample, which was used for training a neural network, could serve.

For correction of a situation, realization of following measures, thus, is possible:
 - To construct sample, taking into consideration additional parameters and additional data.
 - To choose other type of the interface between political model and artificial intellect system.
 - To change a way of the entrance data coding.
 - To optimize sample, by excluding examples erroneous and incorrectly perceived by the program.

REFERENCES

1. Mannheim D., Rich R.K. Political science. Methods of research. - M.: Publishing house "Vesi Mir", 1997. - 544 p.
2. Gavrilov A. The Laboratory practical work on neural networks.
http://ermak.cs.nstu.ru/site/students/ai2/
3. A.Starikov Neural networks as means of data extraction.
http://www.basegroup.ru/neural/ns.htm