Specifics of recognition of signals are on the basis of correlation neuronlike processor

T.O. Zavedyuk

Abstract - **In this paper the neuron reaction on the harmonic signal has been investigated and represented for International Conference TCSET 2010.**

Keywords - **neuron, harmonic signal, digital signal processing, formal neuron model**

I. INTRODUCTION

Development of theory and optimization of decision of tasks of recognition of patterns real-time is an actual scientific and technical task. The objects of investigations here are unidimensional and multidimensional linguistic signals, two-dimensional pictures images, three-dimensional objects of digital holography, tomografii, radio-location, at alias.

One of perspective conductors of theoretical investigations and realization of algorithms of recognition of patterns there is definition of the neyroprocesoriv conditioning of calls in Khemingovomu space [1].

II. THE NEURON REACTION ON THE HARMONIC SIGNALS

Analytical expression of conversion of formal neuron on entrance calls, which is given functional, is in-process [1] resulted

$$Z(t) = \alpha_0 x(t) + \alpha_1 \frac{dx}{dt} + \alpha_2 \int x dx + \alpha_3 \frac{d^2 x}{dt^2} + ...$$
$$+ \alpha_i \int x(t) x(t+\tau) dx + ...,$$

where α_0 - α_i - weighing coefficients;

$\int x(t)x(t+\tau)dx$ - autocorrelation function of entrance call.

As *Z(t)* on escape of neuron an impulsive frequency module signal which will be realized on the basis of threshold function is formed. Thus on frequency f_i conversion of neuron looks like rotined on fig.1.

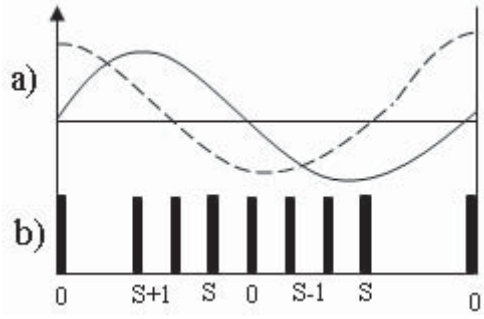

Fig.1 The neuron reaction on the entrance harmonic signal: a) entrance; б) escape; S moment of time sin x=cos x

T.O.Zavedyuk - Carpathians State center of informative tools and technologies of NASU. Ivano-Frankivsk, Pashnyckogo Str 43.
E-mail: tani_@inbox.ru

Without regard to the widespread in literature design of conversion of neuron on a harmonic entrance call the consequences of eksperemental'nikh investigations show inadequacy of such design, as actual sentinel attributes of S-signals of differ from resulted on fig. 1.

Investigation of reverse task, which consists in definition of analytic geometry of entrance harmonic call which generates the real current of impetuses on escape of neuron allows to set that more adequate entrance call is sin^2x. On fig.2. the example of conversion of neuron is rotined on the indicated class of entrance harmonic signal.

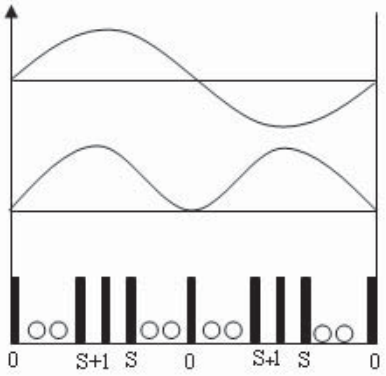

Fig.2 The neuron reaction on the entrance signal sin^2x.

The got consequence shows that at the level of neuron architectures harmonic sinewave signal on the entrance of neuron at the level of generate and deferred entrances space is transformed in quadratic. As a result of such transformation dual-polar harmonic signals are modulated in quadratic space onearctic logical impetuses. Thus frequency of calls 0+1+1 0 answers frequency of fi accordion of entrance call, and the calls of S answer the moments of time when $sin^2x=1-cos^2x$, that answers the experimental attributes of biological neurons adequately. It is got a consequence also well conforms to the macromodels of biotneuron architectures, where it is rotined that calls *of* sin^2x are power the optimum impetuses of activating of neurons.

Evaluation of fig.2. allows to set that the impulsive current of conversions of neuron on the harmonic signal of sin^2x approaches the seven-bytes consequence of maximal length (to the m-code-signal) of class 11100100.

III. CONCLUSION

Investigation of conversion of neuron shows on entrance harmonic signals, that signals *of* sin^2x are most optimum and adequate experimentally investigational attributes.

REFERENCES

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