Предложенная методика решения навигационной задачи, основанная на возможностях независимого вычисления каждой из координат ЛА, выборе оптимальных подгрупп радиомаяков и алгоритмов для каждой из областей коррекции, позволила получить по результатам моделирования точностные характеристики, соответствующие требованиям определения координат для современных беспилотных маневренных ЛА при выполнении требований по надежности, доступности и непрерывности функционирования АСБРН.

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ADAPTIVE RESONANCE THEORY

Computational intelligence models or learning algorithms for data mining have traditionally focused on classification accuracy as a measure of their efficiency. An algorithm that tests with a higher percentage of correctly classified instances is deemed better suited than another to the bias of the application domain. The use of this measure is appropriate in some application domain e.g. pattern recognition where predictive accuracy is the main is the main focus. However in data mining it is very important to understand the underlying decision making process of the computational intelligence models.

This theory passed three stages of evolution: ART1, ART2 and ART3. ART1 model is connected with the binary input signals; ART2 model is for the case with the continuous signal and ART3 theory allows considering actions of global factors.

ART1 – model of neural network, which realizes adaptive resonance theory approaches and consist of two layers F1 and F2/ Input information (in binary mode) enter F1 layer. Neurons of this layer activated and depending on values of initialization status, threshold function determines output value of each neuron, passed through direct couplings on the input of the neurons' layer F2. Herewith, summary of the corresponding neurons' output values of the layer F1 balanced by weights of couplings enters on the input of each neuron of the F2 layer. After the neurons initialization of the F2 layer, neuron - winner is determined which has maximal value of the initialization status. Its output value is delivering through the neurons' feedback couplings of the F1 layer. This output weighted by the weight of the feedback couplings, it transforms into neurons of the F1 layer initialization status. Threshold function determines output values of these neurons as the output of Neural Network.

Neural Network learns is self-teaching by learning examples for several periods with a help of weights changing of couplings depending on power of the level achieve-

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ment. As a consequence of training resonance is set up, when for the couples of value vectors when one vector is delivered on the input of the Neural Net, another vector will be an output and vice verse.

Neural Network is possible to apply for the coordination of interests. It is possible to organize as:

Some participants should to accept or decline the decision. Each of the participants should know his opinion for sure and should vote pros and cons. On the input of the Neural Net with the adaptive resonance delivers information of participants' preferences in the binary mode, so that the 1 is – pros and 0 is – cons, numbers are satisfied to the number of neurons of the input layer. Members delegate to the internal neurons of the Net permissions to vote for the current question. Results of voting will depend on participants' preferences, weight of each participant voice for each internal neuron, weight of each internal neuron for each participant and voting procedure of neurons.

Procedure of internal neurons' "voices" coordination already exists (dictature of the most initialized neuron – the winner, in case of multilayer network another kind of rule can be applied.). Than the decision will be made and in case if all neurons' "voices" (with their weights) reproduce original participants' voices adaptive resonance will be observed. That means that neurons and their choice likely represent interests of the participants with a probable accuracy which is achieved while learning.

Unsupervised learning of the Neural Network consists in selection of neurons' weights providing resonance – representatives of interests. Neurons in this case has nothing special except threshold function thus they are only the elements of the NN. Because of uncertainly conditions more likely to use fuzzy logic, participant should have possibility to distribute voices among "Pros" and "Cons" according to fuzzy expositions.

Main problem which solves Adaptive resonance theory is how to teach by new events and at the same time to save stability and not to delete already existent knowledge. This is the main idea of the Stability- Plasticity Dilemma where:

- Stability – recognized patterns should be insensitive to noise
- Plasticity – System should be capable of learning new patterns

ART can be use in real time mode, can perform fast and slow learning. Fuzziness allows wide range of applicability.

Application areas of the Adaptive resonance theory:

- Mobile robot control
- Pattern recognition
- Risk management
- Facial recognition
- Land cover classification
- Target recognition
- Medical diagnosis
- Signature verification

And etc…

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