U.A.VISHNIAKOU[1], B.H.SHAYA[1]

INTERNET OF THINGS MODEL FOR SOUND INFORMATION CONTROL

[1]Educational institution «Belarusian State University of Informatics and Radioelectronics», Minsk, Republic of Belarus

Using a model that embeds the representation of sounds properties on sources, and the rules that govern their propagation across the various surrounding mediums would help in both, tracking the historical variations and predicting the future changes of sounds properties along the spatio-temporal dimensions. In fact, such a model can represent levels of noise in a large urban space and help in studying noise pollution at various layers: inside a given building, in a specific public park or around the whole city. It shall also help in predicting how spatiotemporal changes may affect the levels of noise pollution at any of these layers, for instance when a new building complex or a compound community take place in the city.

Consider the authors' approach to the symbolic description of a multi-agent model for collecting and processing sound information (CPSI) from the environment, based on the concept of object algebra [2]. Let's present this model as set of seven agents: AIP-agent of input and preprocessing of sound information, AFC-filtering and classification agent, AIDB-agent working with data base of sound information, ACM-conceptual modeling agent, AKB-agent working with knowledge base of sound information classification, ASD – agent for of decision support (DS) making about sound situation, AUI. – agent of user interface. In general this model works including several algorithms. Describe the main of them.

The first algorithm starts from work of many agents AIP which input and collect local sound information in some region and send it to the AFC agent which will also get information from the ACM agent and then send it to the agent ADS . It works with agents AIDB , AKB, AUI (data and knowledge bases, DS and user interface).

The second algorithm have the same cycle as the first one, but in this case if there is some sound information missing so the ADS agent will get back to the AIP agent to get the needed information, and then the cycle will complete as the first one to get a better result.

The third algorithm is that: before the ACM agent give information to the AFC agent it will communicate with the AIP agent and get the required information.

The structure of multi-agent system for Collection & Processing Sound Information (CPSI) is composed of several different components that works together to collect sounds from the environment to get a required output. These components can be classified in two parts. The first part is many detecting and collecting sounds processors from the environment (AIP agents of model), while the other part is software-hardware realization on Server (AFC, AIDB, ACM, AKB, ADS, AUI agents of model).

The detecting or collecting processor is composed of detectors or sound sensors (SD) so that there number of detectors will take in to consideration the zone or place that will be covered so that we will insure that we collect all the sound waves from a specified environment or zone.

These components of MAS CPSI realizes the model special algorithms given above. Common algorithm of MAS will allow specialist to select a specific sound length or sound range. If user willing to collect not only this but also avoid duplication in sound collecting so that if two or more detectors (SD) collect the same sound source from the environment and send it to the Server, it will drop all the common sound waves to decrease the data that will be studied and select the most clear data that was collected with

the sensors by the help of special methods that are provided by the second part of these agents. For practical realization this MAS the network of IoT is designed.

REFERENCES

1. Moisuc B., Gensel J., Davoine P., Martin H. Designing Adaptive Spatio-temporal Information Systems for Natural Hazard Risks with ASTIS. W2GIS, 2006. Pp. 146-157.

2. Vishniakou, U. A. Information security in corporate systems, e-Commerce and cloud computing: methods, models, software and hardware solutions. Monograph. / U. A. Vishniakou. – Minsk : Bestprint, 2016. – 276 p.