KNOWLEDGE ENGINEERING

M.M. Vinkov, I.B. Fominykh. Reasonings on knowledge and the omniscience problem. A part 2: introduction temporal parameter in a meta language

In the second part of article the review of the logic systems formalizing reasonings on knowledge in which the approach to the decision of a omniscience problem in which basis introduction, temporal parameter in a meta language lays is realized is carried out. As against the modal approach considered in the first part of article, the given approach to the decision of a omniscience problem is not connected to any restrictions of deductive abilities of the intellectual agent, whose behaviour is described by logic systems, this approach realizing. Besides such agent during the reasonings is capable to estimate a time resource available at it that is especially important for rigid real times intellectual systems. **Keywords:** epistemic logic, omniscience problem, temporal parameter, resource bounded reasoning, time resource

NATURAL LANGUAGE PROCESSING

I.V. Smirnov, A.O. Shelmanov, E.S. Kuznecova, I.V. Khramoin. Semantic-syntactic analysis of natural languages. Part II. Method for semantic-syntactic analysis of texts

In the paper, we discuss problem of semantic-syntactic parsing of texts in natural language. Review of approaches and methods for semantic-syntactic analysis is presented. We describe syntactic parser of Russian texts created using MaltParser and experimental research of features that influence performance of syntactic parsing of Russian texts. We describe system for semantic role labeling based on method of relational-situational analysis and present its evaluation results on Russian texts. We consider method for joint semantic-syntactic analysis and present its evaluation results on Russian texts. We also compare results of the system based on joint analysis and the system that performs separate consequent syntactic parsing and semantic role labeling.

Keywords: semantic-syntactic parsing, machine learning, syntactic parsing, semantic role labeling, parser.

N.V. Loukachevitch, I.I. Chetviorkin. Open evaluating Sentiment Analysis Systems in Russian

In this paper we describe our experience in conducting the first open sentiment analysis evaluations in Russian within ROMIP 2011-2012. Several train collections were created for such tasks as sentiment classification in blogs and newswire, opinion retrieval. The paper describes the state of the art in sentiment analysis in Russian, collection characteristics, track tasks and evaluation metrics. **Keywords:** sentiment analysis, opinion mining, sentiment classification, ROMIP

INTELLIGENT SYSTEMS AND TECHNOLOGIES

G.V. Rybina, A.V. Mozgachev. Temporal reasoning implementation in dynamic integrated expert systems

The scientific and technological problems of building dynamic integrated expert systems creation and approaches to their solution are discussed. The new stage of development of task-oriented methodology for the integrated expert systems creation are considered in the context of solving dynamic integrated expert systems constructing problems. Particular attention is paid to the theoretical questions related to the temporal knowledge representation and processing. The features of the temporal reasoning software for dynamic version of AT-TECHNOLOGY workbench are described.

Keywords: integrated expert systems, dynamic integrated expert systems, task-oriented methodology, instrumental tools, time representation, Allen's interval logic, temporal reasoner.

T.G. Saluev, I.V. Oseledets, R.Yu. Fadeev. Web-framework for creation of interactive training courses on computational methods

The paper presents an online educational system created at INM RAS in 2012-2013. Problems of topicality of network educational projects are discussed, a comparison of existing educational platforms is provided. Basic principles of implementation are revealed along with a demonstration of a pilot course on numerical mathematics being implemented within the system. **Keywords:** education, online classes, Python, Django

MULTI-CRITERIA ANALYSIS

M.G. Dmitriev, V.A. Lomazov. Assess the sensitivity of a linear convolution of partial criteria under expert determined weight

An approach to solving multi-objective optimization based on the use of aggregated criteria as a linear convolution of individual criteria, where the weights are obtained on the basis of ranking individual criteria in order of importance. A procedure is proposed in order to assess the change of optimal solutions in an elementary change of expert judgments. Constructed a numerical example. **Keywords:** linear convolution, ranking, weights, a small parameter.

O.V. Baskov. Algorithm for Pareto set reduction using fuzzy information on the DM preference relation

A model of multicriteria choice including a set of possible variants, numerical vector criterion, and a fuzzy preference relation of a decision maker (DM) is considered. The problem of multicriteria choices is to select one or several variants from the Pareto set, i.e. to reduce this set. Axiomatic approach to this problem is adopted. In this paper, we consider an algorithm for reducing the Pareto set based on an arbitrary finite collection of fuzzy information quanta on the DM preference relation. **Keywords:** multicriteria choice, the Pareto set reduction, axiomatic approach, fuzzy logic

G. M. Popova, I. F. Dyatchina, N. V. Melnikova. Neuro-statistical model for classification of multidimensional objects biomedical nature

The paper presents a method for the construction of neuro-statistical model based on a combined use of two different methods of processing and classification of multidimensional objects: discriminant analysis and neural network. Based on the example of sputum cytology this article shows the efficiency of construction and use of such models for quantitative differentiated assessment of the state of the slide. **Keywords:** a discriminant classification model of objects, a neural classification model for quantitative assessment of the sputum sample cytological slide, lung cancer.