ABSTRACTS

P.O. Skobelev 6-38

ACTIVITY ONTOLOGY FOR SITUATIONAL MANAGEMENT OF ENTERPRISES IN REAL TIME

Institute for the Control of Complex Systems of the Russian Academy of Sciences, Knowledge Ge-nesis Group of companies
petr.skobelev@gmail.com

In this paper we propose an approach to building ontologies of enterprises that integrate knowledge from various fields to build a conceptual model applicable to a situation of resource management companies. To this end, a brief overview of existing approaches to ontology and category analysis of company characteristics are given; "the way of the master", the epistemological knowledge genesis presented as a chain of inventions and discoveries of the domain, is considered. The article presents a tool kit for working with activity ontologies that can be used, for example, for distribution, planning, enterprise resources optimisation, and some other applications.

Keywords: *ontology, business model, multi-agent systems, resource management, knowledge integration, real time*

P.I. Sosnin, V.A. Maklaev 39-52

INSTRUMENTAL MEANS FOR SPECIFICATIONS OF CONCEPTUALIZATIONS IN DESIGNING OF AUTOMATED SYSTEMS

Ulyanovsk State Technical University
sosnin@ulstu.ru; mars@mv.ru

Perfection of workflows providing the specifications of conceptualizations, promotes increasing of a degree of success in designing the modern automated systems. In paper the new forms and means of specifications based on the real time construction and use of the project ontology in the stepwise refinement of the project, the question-answer analysis of design tasks and their modeling in forms of precedents are offered.

Key words: *automated system, question-answer modeling, design precedent, pseudo-code programming, specification of conceptualization, project ontology.*

A.V. Bukhanovsky, Y.I. Nechaev 53-64

METAONTOLOGY OF RESEARCH DESIGN OF MARINE DYNAMIC OBJECTS

St. Petersburg State University of Information Technologies, Mechanics and Optics
avb_mail@mail.ru;nechaevl@mail.ifmo.mail.ru

The work discusses the questions of ontology and metaontology modifications in the dynamic structure of the intellectual system of the research design of marine vessels and facilities for ocean development. An information model allows the construction of ontology of navigability in complex dynamic environments due to nonlinear interaction of the research objects with the wind and wave disturbances. The structure of the wave field is defined as climatic sea wave spectra. The relationship between the ontology of the information model is represented as a decision tree. A formal model and a hierarchical structure of the ontology are considered in the paradigm of information processing in a multiprocessor computing environment. The article presents a fragment of a semantic network, which determines the ontology of functional elements of knowledge base and realises the dynamic structure of knowledge in the analysis of emergency situations that occur when marine dynamic object are exploited. Particular attention is drawn to the formalisation of the domain to solve the problem of navigability in the case of uncertainty and incompleteness of initial information.

Keywords: *metaontology, dynamic object, navigability, research design, the dynamics of interaction.*

S.M. Krylov, E.N. Grebenschikov 65-72

ONTOLOGY OF HETEROGENIOUS ELECTRONICS SYSTEMS DESIGN

Samara State Technical University
s_m_krylov@mail.ru; orionzzzqqq@mail.ru

The paper deals with basic mathematical prerequisites for development of formal methods for synthesis and improvements of electronics systems and their parts by using heterogeneous functional electronic blocks.

Key words: *ontology of designing, homogeneous circuits, heterogeneous circuits, functional completeness, axiomatic of metaphysics, General Formal Technology, General System Theory, object properties, object functionalities.*

S. D. Makhortov, M.D. Shurlin 73-79

ALGEBRAIC MODELS OF TYPES HIERARCHY FOR DESIGN AND REFACTORING

Voronezh State University
sd@expert.vrn.ru; mshurlin@gmail.com

Algebraic methods are useful while designing and refactoring object-oriented information systems. Such methods could be used like a basis for source code verification and optimization processes. This paper considers kind of lattice-based algebraic structures that describe object-oriented programming type hierarchy. The article deals with the following properties of these structures: closure, transformation equivalency, existence of logical reduction. Described methodology aims at type hierarchy verification and refactoring. One of the refactoring main goals is the automatic reducing of source code redundancy.

Keywords: *type hierarchy, algebraic system, design, refactoring.*

V.A. Uglev 80-86

ACTUALISATION OF DESIGN STANDARDS OF COMPLEX TECHNICAL OBJECTS. ONTOLOGICAL APPROACH

Centre for Applied Research of Siberian Federal University in Zheleznogorsk
uglev-v@yandex.ru

This article describes the approach of documents organisation that standardises high-tech production with the maximum effect of content actualisation. The work sets the basic problems of the development of such instruments and the method of their decomposition for the formation of static and dynamic parts of knowledge field about the domain and strategy decisions. As a tool for knowledge organisation an ontological approach is used, which intends to form a particular ontology and metaontology. Ontological standard as a complete decision support system is presented in the article to provide an automated version of project alternatives formation and optimal decision-making.

Keywords: *standardisation, ontology, design, knowledge engineering, decision support systems, system engineering.*

N.M. Borgest 87-105

FUTURE OF THE UNIVERSITY: ONTOLOGICAL APPROACH. PART 2: ENTITIES, MOTIVATION, PROJECT-BASED EDUCATION

Samara State Aerospace University named after academician S.P. Korolyov (National Research University), Samara, Russia
borgest@yandex.ru

The second part provides a research of the entities of the “university” domain. Their properties and relations are identified. The problems of motivation in the university and motivation of students of engineering specialties in particular are discussed. The data on what motivates undergraduates obtained using the Likert scale questionnaire was analysed and compared with the results of similar foreign researches. Some examples of project-based education development in the higher education institutions of Russia and other countries are given.

Keywords*: university, ontology, design, Project-based education, motivation in education, self-organization*