

Command support systems in planning process of operational tasks: problems of modelling, designing and integration

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The paper deals with some problems of modelling, designing and integration of command support systems. In the focus of our attention are aspects of a telecommunication and information platform for integration of distributed command systems and data interchanging in heterogeneous simulation of combat simulation. Moreover there are described the methods of decision support in a planning process of operational tasks, the methods of creating and sharing a common operational picture (COP) of a battle space. Finally, there is presented case study of decision support system for support of automated command system (C4I) which has been put into practice in Polish Armed Forces. Conclusions deals with network centric aspects of decision support in command systems.

Keywords: decision support systems, command support, modelling and simulation of combat, distributed systems, artificial intelligence, operational research.

Thing about some assuring interoperability of information and information technology systems conditions

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In this article, starting from some popular descriptions of interoperability, was presented short discussion of this term according to properties of information and information technology systems. In the next step was described two thesis about some assuring interoperability of information systems (thesis 1) and information technology systems (thesis 2) interoperability conditions. As an illustration example was presented selected problems in implementation of real information technology systems, in which author in time period 2005-2007 was head of Poland's governmental implementation team. According this real example was described conditions of interoperability implementation, formulated in thesis 1 and thesis 2.

Keywords: : interoperability, information systems, IT systems

Ontology modeling usage for Common Operational Picture acquisition

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This work concentrates mainly on methods of integrating several aspects of battlefield data using ontology models and presenting such data in rich GIS environment. Such approach allows to organize and filter data using predefined filters dedicated for various level of command and types of operations. Combining semantic data representation and semantic query languages like SPARQL allowed to produce extendable and rapid mechanism for information presentation which generates Common Operational Picture. Published results consist of analysis of known models representing different views on COP. Based on such study there have been proposed, a core ontology for representing current battlefield scenario filled with all geospatial information and data proposed by decision support algorithms and military domain analysis. This article describes designed layered architecture based on SOA and a proof-of-concept prototype demonstrating, a NEC integrated battlefield picture. The subsystem has been designed and prepared to be powered from external data sources such as heterogeneous C4I systems and other military-government data sources.

Keywords: modele semantyczne, GIS, ontologia, systemy wspomagania decyzji, ZSD

Enterprise architecture management method

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In this article manner of enterprise architecture management was described. This approach encompasses software development methodology, fashion of description and tools support. Rational Unified Process (RUP) software development methodology was proposed. Mapping of RUP on Zachman Framework was also presented. Unified Modeling Language (UML) 2.0 was used to description of enterprise architecture. The method application was presented on example of public service "Participation in public order" described in "Wrota Polski". In the example using of IBM Rational Software Architect and IBM Rational RequisitePro tools was presented.

Keywords: enterprise architecture, information system development process

The vaccination against epidemic spreading in Complex Networks

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The paper focuses special attention on research of Complex Networks. Complex Networks have Scale Free and Small World features, what make them accurate model of many networks such as social networks. These features, which appear to be very efficient for communication networks, favor at the same time the spreading of many diseases.

Based on defined centrality measures, we show how to discover the critical elements of any network. The identification and then vaccination of the critical elements of a given network should be the first concern in order to reduce the consequence of epidemics.

Keywords: complex networks, small word, scale free, vaccination strategy

CARE – Creative Application to Remedy Epidemics

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The paper focuses special attention on a project named CARE. The developers of the project is *NosoiFighters* team, which consists of students of the Cybernetics Faculty in Military University of Technology. The system is a very creative software solution that takes advantage of pioneering sociological theories, graph/networks theory and the last but not least most advanced technologies. It has a very practical purpose, in particular nowadays: countering infectious diseases, for instance HIV/AIDS, malaria, SARS, etc. The paper demonstrates how the system can help us to nail epidemics. CARE has enormous practical potential in regions such as Africa, where there are not enough medicines to treat all who are at risk.

Keywords: complex networks, centrality, epidemic spreading, vaccination

Early estimating the number of errors encountered during program testing

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An approach to estimate the number of errors encountered during the program testing process is proposed in the paper. Considerations are based on some program reliability growth model which is constructed for assumed scheme of program testing process. In this model the program under the testing is characterized by means of so-called characteristic matrix and the program testing process is determined by means of so-called testing strategy. The formula for determining the mean value of the predicted number of errors encountered during the program testing is obtained. This formula can be used if the characteristic matrix and the testing strategy are known. Formula for estimating this value when the program characteristic matrix is not known are also proposed in the paper.

Keywords: Software testing; Software reliability; Program correctness; Reliability growth model