ABSTRACTS

Quality improvement of the software development process based on the sequential analysis of variants method and the method of local optimization / M. D. Godlevsky, E. E. Rubin, A. A. Goloskokova // Bulletin of NTU "KhPI". Series: System analysis, management and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 5–10. – Bibliogr.: 7. – ISSN 2079-0023.

There have been proposed the interplay of the method of local optimization and the sequential analysis of variants method for quality improvement of the software development process. As far as, with the use of the developed algorithm of the sequential analysis of variants method, total time spent solving this problem is much higher than the permissible limits. The next conclusions have been made based on the results: the methods interplay provides quantity reduction of possible options of the software development process evolution. Also the interplay of the above mentioned methods makes it possible to reduce the complexity of the solving problem, but it does not provide a guarantee, that this solution corresponds to the global extremum.

Keywords: quality, software, local optimization, sequential analysis of variants.

Prototype development and productivity research of marker-based mobile augmented reality system / O. V. Vekshyn, M. V. Tkachuk, M. O. Panteleiev // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 11–18. – Bibliogr.: 21. – ISSN 2079-0023.

This paper provides an overview of modern technologies for development mobile augmented reality systems, additionally considered examples of such systems. In this paper presented such augmented reality technologies like: marker and not marker-based technologies, geolocation technologies and technologies based on infrared sensors. For each type of such technologies provided several examples of software applications. Basing on review of typical architectures for mobile augmented reality systems proposed the architectural model of adaptive marker-based mobile augmented reality system and presented the prototype construction of such a system with Google Android platform and Metaio SDK. Presented some conclusions about the performance of mobile systems and possible methods to solve performance problems with data processing.

Keywords: mobile information systems, augmented reality, software, mobile augmented reality systems, Android, Metaio.

Analysis of the electronic filters Butterworth by numerical methods / V. P. Severin, O. M. Nikulina, V. S. Burjakovskij // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 19–24. – Bibliogr.: 3. – ISSN 2079-0023.

On the base of the placement of the poles of transfer functions for Butterworth's filters of different orders the mathematical models are created. The transfer functions of Butterworth filters odd and even orders are presented. The mathematical model of Butterworth filter arbitrary order as a linear system of differential equations is developed. For integration of linear systems of differential equations the method with using formula of definition of matrix exponential and its integral is considered. Algorithms for calculation of transients in filters and their quality indexes are designed. Amplitude-frequency characteristics, transient functions and direct quality indexes of Butterworth filters of different orders are calculated. Graphics of amplitude-frequency characteristics and transients of filters are built. The values of direct quality indexes of Butterworth filters of different orders are submitted. With increasing order of Butterworth filter all its direct quality indexes significantly increasing, which make it necessary to solve optimization problems of filters.

Keywords: electronic filters, Butterworth filter, mathematical model, transfer function, transients, direct quality indexes.

To the question of the application of the methodology of scoring to the problem of portfolio securities / V. A. Guzhva, A. G. Sokolova // Bulletin of NTU "KhPI". Series: System analysis, management and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 25–31. – Bibliogr.: 4. – ISSN 2079-0023.

The technique of portfolio optimization, which is an alternative to classical. The method is based on scoring models of the securities represented in the following formula convolution of the normalized estimates of yield, risk and liquidity of the securities. The result of the calculation for this model for each type of securities is the factor of investment attractiveness, in proportion to the value which will determine the share of securities in the portfolio. The technique differs considering the many environmental factors, the price characteristics of the securities and the liquidity preference of the investor; The application for the weak development of the stock markets with low volatility; ease of processing; independent review of risk and return; Availability of procedures excluded from consideration for investment unattractive tsennyh bumag. The technique allows real-time to evaluate options for the structure of the portfolio of securities in terms of investment attractiveness and get the optimal investment decisions.

Keywords: securities, scoring, profitability, liquidity, risk factor of investment attractiveness.

About the approach to the development of recommendations for the improvement of business processes related to supply of products / D. L. Orlovskyi, A. M. Kopp // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 32–41. – Bibliogr.: 5. – ISSN 2079-0023.

Here proposed the approach to the development of recommendations for the improvement of business processes related to the supply of products by analyzing the values of planned and actual performance of the logistics business process model and further define the business processes that need improvement. To determine the targets of business processes is proposed to solve the problem of determining the optimal level of product orders. On the base of math support and algorithms was developed the software for solving the problem of managing supply process of trading enterprise. The software was used to make test calculations. The results of test calculations were used to create recommendations of improving of trading enterprise business process.

Keywords: supply, process management, process approach, business processes, trade enterprise, SCOR model.

Determination the status of football club using balanced scorecard / I. A. Bocharnikov, D. L. Orlovskij // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 42–51. – Bibliogr.: 5. – ISSN 2079-0023.

Today science has got a lot of methods which can help us to understand properly the football club functioning and development throughout all its life cycle. We will consider the football club as particular case of the enterprise at all. This article is considered with solving the problem of determine the football club status. To solve this problem using statistics of football club key performance indicators is recommended. There were extracted key performance indicators, which are inherent to the football club, was developed a database for the storage and processing of statistics, the conclusion about the status of the football club was made.

Keywords: determination of the state, the balanced scorecard, database, problem situation, football club, key performance indicators, situational management, software.

Recursive least squares processing of fuzzy measurement / Yamen Hazim, V. A. Golovko, M. N. Starova // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 52–57. – Bibliogr.: 10. – ISSN 2079-0023.

The problem of statistical processing of time series, given by a set of fuzzy measurements. The analysis of the traditional approach to solving this problem and formulate its drawbacks associated with the need to continuously replenished storage array measurements and the neglect of various utility of

"old" and "fresh" measurements. The application of the recursive version of the method of least squares. Relationships for recursive calculations of the vector of parameter estimates of the regression model describing the behavior of the controlled parameter. The purpose of the article - the development of a method of implementing the traditional procedure of recursive processing of measurements for the case when these measurements are fuzzy values. To describe the values of fuzzy measurement of the controlled variable used membership function (*L-R*)-type. Described step by step technique for calculating the parameters of membership functions of the fuzzy result of applying the recursive procedure. Defined function of fuzzy values of the controlled variable at the time of the forecast.

Keywords: method of least squares, recursive processing, fuzzy measure.

In this paper was made an analysis of the diffusion process in the sugar industry and the basic parameters and the parameters of the diffusion apparatus. The optimal operations of the diffuser (that) allow you to get an effective yield of the raw juice and reduce the amount of feed water and steam heating were selected. For the main variables studied juice extraction process statistical characteristics were defined- mean, variance, median, and the coefficients of skewness and kurtosis. A linear regression model of the diffusion apparatus was found and an analysis on the application of this mathematical model was made. Determining the structure of the model to describe the dependence of the diffusion flow of juice from the other factors of the diffusion process was carried out by stepwise regression identified the coefficient of determination, the consent of the employees measure the regression model with the available data. On the grounds of the analysis was concluded that the mathematical model created for the first time as a first approximation, can be used to control the process parameters of the diffusion apparatus. Determining the significance of the coefficients of the regression model parameters for diffusion apparatus was obtained.

Keywords: sugar industry, process, diffusion, mathematical model, statistical data, factors, parameters, adequacy, the regression equation.

There has been discussed the problem of selecting the optimal parameters of the automated control system technical tools set by disposal of a mixture of industrial and domestic sewage, as well as surface and drainage flow, to the sewage disposal plants. The system includes three levels of the information transformation, - measurement, transmission and processing. In the subsystems of one level the information is converted in parallel while at different levels it is converted sequentially. The algorithm for solving the task is based on the decomposition of the original global task into a series of simpler local tasks that can be solved using the standard dynamic programming method.

Keywords: body of water, sewage, wastewater disposal, automated control system, set of technical tools.

The given work presents a multiagent system of monitoring of higher education establishment research results. The methods of representation of of agents' abstract architecture are considered. Such methods allow to describe formally the way of agent's functioning. The abstract architecture is based on the set of environment states, the set of agent's perceptions of the environment, the set of agent's possible actions, perception function and action selection function. The method of comparator

identification of intelligence theory is used in order to formalize the rules how a reflexive agent based on a model acts. The given work considers the formal architecture of the agents of four types which are responsible for data sources searching in the process of research results monitoring.

Keywords: monitoring, topic crawling, multiagent system, abstract architecture, comparator identification.

Formation of indicators of similarity between objects, characterized by the parameters measured in different measurement scales / I. P. Gamajun, O. M. Bezmenova // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 88–91. – Bibliogr.: 4. – ISSN 2079-0023.

As part of the clustering task (object classification) solved the problem of estimating the degree of similarity of objects described by features measured in different scales, namely the scale items (nominal characteristics) and quantitative scale. Proposed coefficient of similarity of objects described by nominal attributes. If there are signs belonging to different scales, it is proposed to use the article developed a combined ratio of similarity. Conclusions about the properties of the proposed indicators of similarity.

Keywords: clustering, classification of objects, scale items, nominal features, the degree of similarity coefficient, the combined rate the degree of similarity.

Analysis of the commercial enterprise activity using BI-tools / D. L. Orlovskyj, M. S. Pylypets // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2014. – № 55 (1097). – P. 92–99. – Bibliogr.: 5. – ISSN 2079-0023.

The article deals with questions of the commercial enterprise analysis using BI-tools. Proposed solutions and approaches are aimed at preventing emerging of certain problems and limitations. The problem of the company key performance indicators forming and ranking is also considered. Advisability of using of simulation based on the generation of normal random variables for the actual trajectories analysis is justified. The process of developing software tools for enterprise analysis tasks based on the using of KPI is briefly discussed. An example of using the developed software for the analysis and control of the actual trajectory changes of the one indicator of a commercial enterprise is presented.

Keywords: analysis of the company, BSC, KPI ranking, data mining, problem situation, simulation, BI-tools.