
ABSTRACTS

TECHNICAL SCIENCES

Gribkov E. P., Gavrilchenko E. Yu. Study of the influence of the discrete nature of the material volume decomposition on the accuracy of calculation for finite element modeling of the process of thick sheets straightening // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

On the basis of the implementation of the three-dimensional finite-element model of the straightening process of the corrugation of the sheets, the effect of the discreteness of the decomposition of the volume of deformable material on the accuracy and time of calculation which are meant to reduce the amount of computer time spent when solving the problems of the optimization plan to determine the straightening modes. The design scheme consisted of a deformable sheet, seven working rollers with a pitch of 110 mm and a diameter of 100 mm. Simulation of the straightening process was carried out for a sheet which was 2.5 mm thick, 150 mm wide and 500 mm long, made of 08kp steel. To simulate the bending of the working rollers axis of the rollers the third roller barrel was made convex. It was found out that when modeling the rational number is 4500 finite elements with a ratio of the diameter of the working rolls to the sheet thickness $D/h = 40$ or 15 elements per 1 mm of the running length of the sheet, while the realization time of the model was about 1.3 hours with the variation of the straightening forces which were 3 % higher relative to a more accurate solution.

Kulik T. A., Kulik N. A. Improvement of temper rolling quality in the warm deformation mode by modeling of mechanisms of residual stress forming // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

Taking into account the influence of real temperature conditions of implementation of temper rolling process referring thin bands, sheets and strips in the range of temperatures of warm deformation the method of calculation of the mechanism of forming of residual stresses in a strip and their distribution along cross-sectional height is specified. The analysis of ratios of residual stresses, tension on an axis of deformation and thermal and mechanical coefficient of temperature conditions effect of process implementation for different levels of current and external friction coefficients is carried out. It is shown that the temperature increase results in the increase of residual stress level of compression in the outer layers referring thin tapes, sheets and strips.

Razzhivin A. V., Studenov A. E. Development of the mathematical model of the temperature field of a forming roll when processing in a high-speed heating furnace // Scientific bulletin of DSEA. – 2017. – № 2 (23E).

The emerging processes of heat conduction and thermostressed state when using the technology of differentiated heat treatment are considered. The heating mode in which the probability of breaking the roll under the influence of internal thermal stresses is minimized mode is proposed. The mathematical model of the temperature field of a forming roll for processing in a high-speed heating furnace is developed. The result of the simulation is the ability to minimize the probability of breaking the roll under the influence of internal thermal stresses.

Dzerzhinskaya O. V. Physical modeling of the skis of the walking mechanism of the drag-line excavator // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

These studies are devoted to finding ways to improve the running equipment of drag-line excavators by upgrading the ski support surface of the walking excavator movement mechanism. The method of physical modeling was chosen for the research. The basic formulas and relations of the reference machine and model are given. The analytical dependencies to determine the scale factors that will be required for constructing the physical model of the walking excavator skis are obtained. The stated technique will allow solving the optimization problem by the parameter of the drag-line excavator movement mechanism at the stage of designing the walking excavator.

Donchik D. D., Nalivaiko A. M. Analysis of methods for diagnosing and eliminating load swing of a bridge crane trolley during the production process // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

Prevention of critical swing of the load of a bridge crane trolley when moving during the production process is considered. The analysis of the ways of diagnosing the critical swing of the load of a bridge crane trolley is given. The classification into main and auxiliary cranes and their description are made. The analysis of methods of elimination of load swing of a bridge crane trolley as a whole, their division into different groups, conclusions concerning more suitable enterprises for different levels of solvency, namely - more expensive and less expensive, is also carried out. Also, more technologically advanced ones and more simplified ones were identified. The conclusions regarding the analysis done and the information provided on the issues discussed in this paper are made.

Kindenko N. I. Magnetostrictive strengthening and magneto-dispersion hardening of high-speed steels in pulsed magnetic fields // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The article is devoted to the study of issues related to improving the operational properties of tools from high-speed steels by means of magnetic-pulse processing, which is a combination of electromagnetic and thermodynamic methods for controlling the non-equilibrium structure of substances. The analysis of the mechanisms of magnetostrictive strengthening and magnetic-dispersion hardening of high-speed steels in pulsed magnetic fields is carried out. It is shown that magnetostrictive strengthening and magnetic dispersion hardening of high-speed steel as a result of the influence of a magnetic field makes it possible to explain the improvement in the performance characteristics of a cutting tool subjected to pulsed magnetic processing. It is noted that the primary reason for improving the performance characteristics of the tool subjected to magnetic treatment is the change in properties of the tool material, which is due to magnetostrictive hardening of high-speed steel. It is determined that as a result of magnetic treatment high-speed steel undergoes volume strengthening, dispersion hardening, becomes more homogeneous in structure and improves its physical and mechanical properties.

Kovalevsky S. V., Zaluzhna G. V., Vladimirov E. A. Investigation of reversible friction hinges in machines of industrial transport with the purpose of increasing their durability // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The efficiency of reversible friction hinges in the control systems of transport vehicles functioning under different operating conditions is considered. The analysis of wear-resistance of the parts of reversible hinges in transport vehicles, which function under conditions of a corrosive abrasive environment, demonstrates their increased wear and unreliability in work. The acting loads on the hinge parts of coupling devices are investigated and a plastic contact is determined in the friction pair, which causes increased wear of friction surfaces. As a result of the research, the authors represent constructive development of hinges, which induce auto-compensation of friction surfaces wearing in conjugated parts and improve the operating of conjugated surfaces due to the constant supply of lubricant to friction surfaces.

Kovalevskyy S. V., Yemets V. V., Pelipinko A. A. Study of the roller-gap processing of parts surfaces // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The method of electric-discharge machining of parts surfaces is proposed and justified in the article. A hypothesis based on the electric discharge processing is proposed. The assumption that the high-voltage discharge of a given polarity has a positive effect on the structure of a part surface layer in the result of the action of induced fields contributing to the strengthening of its structure was put forward. The scheme of the experimental setup is presented, as well as the research methodology. A special feature of the research methodology is the use of the information from the measured spectrum. The results of the conducted experimental studies are presented, in which the sensitivity of the selected source of an information channel to constantly changing conditions is shown. Existence of special areas of setting the installation relative to the surface under treatment and the modes of electric discharge processing was revealed. Directions for further investigations in the form of wear-resistance testing in the modified surface layers are shown.

Kovalevskyy S. V., Kovalevska O. S. Design features mechatronic systems machines with parallel kinematics //Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The article considers the main advantages and disadvantages of parallel mechanisms. Using technology machines machine can be considered as a control and measuring machine manufacturing. First systematized approaches and tools for modeling mechatronic systems, considered as a kind of automated control systems. Tool mechatronic system simulation using ECAD system that can simulate the CAP and mechatronic systems in the domain of electronics thanks to the tools of behavioral modeling are recommended. A new approach mechatronic system simulation in ECAD, theoretically and experimentally by its features, and the adequacy of the region. For the first time, based on predefined criteria comparative analysis programs CAE, CAS and ECAD because of their applicability to simulation of mechatronic systems, based on what made recommendations on the choice of programs and universal method of simulation that has practical value for electronic engineers who design systems automatic control and management of mechanical objects.

Podlesny S. V., Zhuk Y. A., Krivoruchek V. V. Investigation of the dynamics of electrical measuring devices in Mathcad system // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

Electrical measuring instruments are studied in this paper. Finite-dimensional models, in which electromagnetic and mechanical quantities characterizing the system are considered as formally equal and described by the Lagrange-Maxwell equations, can be used for the description of the dynamics of electrical measuring instruments. Mathematical modeling, which allows with the usage of Mathcad computer algebra system to replace the study of complex electromechanical energy converters by relatively simple models for practical implementation and to select a rational combination.

Bohaievskiy O. B., Borisenko A. N., Borisenko E. A., Ivchenkova O. Y. Analysis of error of integrating transducer of phase lag // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

A block diagram of a digital device for measuring the phase lag between pulse sequences is proposed. The technical properties of the device allow measuring phase delays between pulse sequences that have repetition rates of F and $0.5F$. Based on the methods of information theory and error theory, the metrological characteristics of the proposed phase meter have been explored and it is established that it meets the requirements of a computer system for measuring accuracy. To refine the metrological characteristics of the proposed phase meter, statistical processing of the experimental data was performed. On the basis of the information approach, the entropy value of the measurement error of the phase shift by the proposed device is obtained. The results of theoretical studies and experimental data coincide.

Vasilyeva L. V., Shelest A. I. A mathematical model for optimizing the composition of an IT project team // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The article explores the possibilities of managing human resources taking into account their qualifications when they are allocated to projects (tasks). Factors influencing the optimality criteria are revealed. Mathematical models have been constructed to optimize the composition of the IT project team for two types of tasks: critical and minor. The diagram of precedents of business process of the program-methodical complex for management IT-projects is given. Preliminary calculations have shown the effectiveness of the proposed approach, with the use of which it can be possible to minimize costs for tasks of the minor type and reduce the time for the process of developing critical tasks.

Vazhinsky S. E., Zalevsky G. S., Verkhovec D. D., Kononenko M. V., Gudkova K. Yu. Automated system for monitoring and measuring the parameters of the network of fire water supply // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The lack of an effective methodology for carrying out experimental studies and corresponding hardware controls and controlling the parameters of the city's water supply network presupposes a significant water flow. A thermoanemometric primary transducer for constructing a flowmeter is proposed, its metrological characteristics are investigated. On the basis of modern means of computer technology, a system of automatic control of the city's water supply has been developed. The mathematical modeling of the process of the flowmeter functioning taking into account changes in the environmental parameters is carried out. On the basis of experimental data, the efficiency of using a thermal mass flowmeter for measuring the parameters of a fire-prevention water supply system (measurement error, conversion speed) has been established.

Novozhilova M. V., Chub I. A., Isikova N. P. Method for assessing the characteristics of an emergency situation with the release of a hazardous chemical // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The rapid identification of the parameters of a chemical emergency and the prediction of its expansion is an important problem, especially when the source of pollution is located in a densely populated area. In this case, the accident can lead to losses among unprotected personnel and the population, which requires the operative determination of its parameters in real time. The paper suggests methodological support for the estimation of the emission parameters of a gaseous hazardous chemical. When determining the concentration field of a hazardous chemical, the Gauss dispersion model was used. Estimation of parameters of an emergency situation and forecasting of its development were carried out on the basis of data processing from a set of sensors for measuring the concentration of gaseous hazardous chemical.

Pulyayev V. A., Reshetnyak T. V. Correlation processing of signals from specialized radiosystems // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

An example of the modernization of the correlator of a specialized radiosystem – of the incoherent scatter radar, which is operating in real time in the mode of monitoring the state of near-Earth space, is given. In the structure of this correlator introduces additional computational channels, delay lines and communication elements between them. This modernization makes it possible to obtain of the height distribution of the autocorrelation functions of the signal scattered by ionized particles of the ionospheric plasma, in the form of basic and complementary mirror components. These components mutually complement each other. As a result, along the direction of sound for each high-rise element without degrading the resolution of height and time, the statistical accuracy of calculating the statistical characteristics of this signal increases. Also, the characteristic features of the behavior of the power profile of the scattering signal along altitude are also taken into account.

Yenikieiev O. F., Zakharenkov D. Y. Analysis of the characteristics of the mathematical model of the kinematic circuit of the internal combustion engine // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

As a deterministic mathematical model of the kinematic scheme of a diesel generator, a mechanical system with ten degrees of freedom is proposed. The system of integro-differential equations establishes the information relations between the actions of cylinders and the signal of the fluctuations of the rotational speed of the first mass. As a result of mathematical transformations received transfer functions that establish a connection between the actions of

individual cylinders and the signal of measurement information. On the basis of the frequency representation of the signal of fluctuation and torque of cylinders, an information technology for assessing the identity of the working cycles has been developed. According to the results of the solution of a redefined system of algebraic equations, the corresponding hardware generates programmatic changes in the adjustment of the fuel and air supply processes to the cylinder of the diesel generator.

Mikhailchenko E. A., Klimchenkova N. V. The dynamic processes calculation in electromechanical systems of mine lifting machines // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

In the article, features of mathematical representation in the asynchronous engine as the generalized electric has been presented. In order to reduce the dynamic loads and increase the longevity of the lifting plants operation, tachogram with smooth segments between speeds, without a jump-like change in acceleration, are used. With such an approach, the tug is limited. The size of the tug has not only generates dynamic loads in the elements of the lifting system, but also affects the feelings of a person in the cage. The optimal tachogram of cargo movement, in which there is no fluctuation, is the keystone of the law changing the acceleration in the system. The article deals with the calculation of dynamic processes in electromechanical systems of mine lifting machines with DC motors, which implements the trapezoidal law of acceleration changes. The method of calculation in dynamic processes electromechanical systems of mine lifting machines with DC motors is considered. It will allow installers and researchers of mine lifting plants to formulate new requirements and create modern control systems.

Melnik A. A., Sheremet A. I. General approaches to the synthesis of electromechanical systems by the method of generalized characteristic polynomial // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The method of the generalized characteristic polynomial demonstrated in the article makes it possible to synthesize automatic control systems on unified methodological principles, providing a comprehensive approach to the formation of zeros and poles to transfer functions in systems, and these automatic control systems provide control of the output coordinate according to any chosen standard form of the transition function. Synthesis by the method generalized characteristic polynomial greatly extends the capabilities of the systems of subordinate regulation, ensuring their dynamic performance not only in accordance with the technical or symmetrical optimum, but also any standard form of transition functions without the use of filters, but only with the help of regulating coordinates. The synthesized systems of automatic control by the method generalized characteristic polynomial make it possible to combine the advantages of modal regulation systems and the advantages of subordinate regulation systems.

Sheremet A. I., Pristinsky M. S. A mathematical description of an asynchronous motor as a generalized electric machine in a two-phase coordinate system // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

In the article we have featured the mathematical representation of the asynchronous engine as the generalized electric machine in a two-phase orthogonal coordinate system are considered. A number of generally accepted assumptions and limitations are used. The current level of development in the computer technology makes it possible to build the model of an induction motor in phase coordinates, taking into account the assumptions made. To simplify mathematical models, the system of equations in a three-phase asynchronous machine has been written in phase coordinates and its usually represented in an orthogonal coordinate system and rotates in space in the general case with an arbitrary angular velocity. When implementing a microprocessor control system for an asynchronous electric drive with a frequency converter built on transistor modules IGBT and with pulse width modulation of the output voltage, the best is the dynamic model an asynchronous motor in a coordinate system rotating at the rotational speed of the stator field.

Sheremet O. I., Sadovoy O. V., Sohkina Yu. V. Synthesis of double-loop electromechanical system with a DC motor by using elements discrete time equalizer theory // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The article deals with the method development of the double-loop system in the thruster converter-DC motor synthesis, taking into account the feedback on the electromotive force of the motor, which would combine the advantages of existing analytical methods analog systems synthesis with advanced control capabilities provided by regulators synthesized by using the theory of discrete time equalizer. In this case, the internal circuit influence compensation is carried out in a discrete manner by putting the special item into the structure of the main circuit equalizer, which includes the inverse value and the desired transfer function of the current loop. Naturally the transitive functions in this approach can be changed by special adjustment factor, which is a part of the discrete time equalizer transfer function. The experimentally obtained dependence of overregulation on the adjustment factor is exponential.

ECONOMIC SCIENCES

Akimova E. V., Havryliuk L. A. Problems of accounting in the public sector in the conditions of modernization // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

In the article are examined the main problems of introduction and development trends of accounting and financial reporting in budgetary organizations of Ukraine. Is reviewed the international best practices of major accounting public sector management. The advantages and disadvantages of the domestic method of accounting in the public sector are determined. Is investigated the practice of application of accrual accounting in various countries of the world. The study of the regulatory support application of the method of recognition of income accounting in the public sector of Ukraine is conducted. In the article are substantiated the main actions necessary to continue implementation of reforms in accounting institutions of the public sector and approximation of national standards to international requirements.

Bolotina E. V., Akulenko A. V. The process of information of public administration: modern problems // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

In the article is considered the problem of improvement of information support of state authorities in terms of administrative reform. Scientific research stresses the lack of a common accepted definition of information competence which most scientists belong to basic competence, but there are substantial differences in the definition of its structure. The article confirms the feasibility of expanding existing areas of training in the field of public administration, meaningful organization of the system by the professional education, improving of the overall culture and responsibility of managers. Are proposed areas of improvement with information technology in the processes of development and making management decisions.

Voloshina E. A., Bruev D. D. Evolution of scientific views on the nature and functions of entrepreneurship // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

In the article the main stages of the formation of the theory of entrepreneurship are considered, proceeding from the comprehension of this phenomenon from the moment the term was introduced into scientific circulation by the French banker G. Cantillon in the 18th century. It is substantiated that the path that has passed this phenomenon at the moment is worthy of special study. The relevance of the research is determined by the growing demand for entrepreneurship, which provides opportunities to find valuable solutions to problems of a different nature and scale in the changing Ukrainian economy. In these conditions, there is a need to develop the theoretical foundations of entrepreneurship, all the more so in the theory of entrepreneurship there are numerous methodological problems that lead to misleading results. Various scientific approaches to the essence and development of entrepreneurship are considered, its main functions and its determining factors are singled out. An entrepreneur is seen as an innovator who introduces new needs, goods, production technologies or forms of work organization into the consumer's environment on a commercial basis.

Mishura V. B., Spicin A. E. Evolution of the concept, classification and economic essence of fixed assets // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

Are considered the problems of existence of different approaches to the existing of terminology and the determination of the economic essence of fixed assets in the conditions of harmonization of their accounting with international standards, the classification of the main means for optimization of their structure is analyzed. It is proved that the existing procedure for organizing accounting for operations with fixed assets does not allow for a complete economic analysis. It is substantiated that the uncertainty of regulatory regulation, numerous changes in the legal framework contributed to the distortion of the essence of fixed assets, the lack of a correlation between financial and tax accounting of fixed assets, as well as the ambiguous perception of information about them by specialists.

Oleshko T. I., Hrebenuk S. V. Tactics governed by the currency risks of commercial banks // Scientific Herald of the DSEA. – 2017. – № 2 (23E).

The activity of banks in foreign exchange markets, which consists in managing assets and liabilities in foreign currency and in bank metals, is related to currency risks that arise in connection with the use of various currencies and banking metals during banking operations. Development and improvement of modern methods of currency risk management is one of the priority tasks of management personnel of banks in the probability of crisis conditions. The article is devoted to the study of the management of currency risks as influential factors in the conduct of banking business. The article deals with the methodology of currency risk management, presents the matrix of the tactics of currency risk management, and also characterizes the process of managing the currency risks of a commercial bank.

Sidorenko I. V. Organization of management accounting at oil and fat industry enterprises // Scientific bulletin of DSEA. – 2017. – № 2 (23E).

Management accounting is a subsystem of the general accounting system of the enterprise, serving the managers of the operational level. The organization of managerial accounting is significantly influenced by technological and organizational features, which are determined by the industry affiliation of the enterprise. This is primarily a specific production technology for fat-and-oil enterprises. In the article features of the organization of the administrative account at the enterprises of fat and oil industry are considered. The technological process of production and the features of calculating the cost of product of fat-and-oil enterprises are researched. The scheme of objects of the management accounting on the basis of the executed research is developed. This allows defining the responsibility centers for obtaining relevant information by the accounting system.

Shevchenko E. A., Lendel O. A. Simulation of the National economic system in terms of economic development scenarios variability // Scientific bulletin of DSEA. – 2017. – № 2 (23E).

The article is devoted to the problem of the adaptation of the national economic systems, which are based on the empirical reality, and generalize the individual processes and the categorical hierarchy that reflects the original concept of the system and, however, forms the possible theoretical outline for the study of this category and development of the model of the national system in terms of variability of economic scenarios. So, today we have to consider the favourable simulation of the evolution of the national economic system using the civilizational approach and the individual characteristics of the concept of economic development. In our opinion, the most appropriate is the use of key elements of "game duality" and "shock therapy" in conjunction with the mandatory adaptation to the globalization of the essential changes that have an impact on the national economic system of our time.

Shubnaya E. V., Bocharow V. S. Theoretical bases of management of the internal motivation of work activity // Scientific bulletin of DSEA. – 2017. – № 2 (23E).

The general goal of the presented article is to generalize the theoretical foundations of managing the internal motivation of work activity on the basis of taking into account the characteristics of the employee's personality structure. Motivation is seen as a process of activating the motives of employees. The necessity of interrelation of internal and external motivation is grounded. External motivation is the behavior determined by physiological needs and stimulation of the environment. Internal (procedural motivation) - the behavior caused by the factors, that are not related to the influence of the environment and physiological needs. The necessity of taking into account the interrelation between internal and external factors of personnel formation and development, which allows to develop a number of tools that allow to form certain social and labor relations in the team, is substantiated. The composition of the motivation tools will depend on the size of the organization, the specifics of its activities, the level of staff development, the corporate culture, the organization's strategy, the personnel policy, the professionalism of the personnel management service and the head of the organization.