

**Part 1**

**VIRTUAL AND INTELLIGENT SYSTEMS IN  
SCIENCE AND TECHNOLOGY**

Shelkovnikov Yu.K., Ermolin K.S., Kirillov A.I.,  
Osipov N.I.

APPLICATION OF ELECTROMECHANICAL  
MODELING IN ACOUSTIC MICROSCOPY .....6

The article deals with results of electromechanical simulation of acoustic behavior of a sample with a metal inclusion. Electrical simulation uses a method of analogies for a research of mechanical model of a sample. The dependence of an echo-signal of an acoustic microscope on the sizes and properties of inclusion in a sample is considered.

Keywords: acoustic microscope, echo- signal, ultrasound, electromechanical simulation.

Pronin S.P., Nei L.V.

DEVELOPMENT OF THE ALGORITHM  
AUTOMATED MONITORING OF MARKING  
OF CONDENSERS.....11

In an analysis result of images of markings of the condenser and mathematical formulas, the algorithm of automated monitoring of marking of condensers based on computation of the amount of a difference of images is developed. On the basis of researches for the size of the reference image 350\*600 of pixels the threshold of coincidence of images of marking of the condenser and the reference image is offered.

Keywords: image, marking of the condenser, monitoring, algorithm.

Lysak I.A., Zvegintsev V.I., Lysak G.V.

APPLICATION SOFTWARE FOR POST-  
PROCESSING OF PRESSURE MEASUREMENT  
DATA IN SECTIONS OF STREAMS OF GAS-JET  
DEVICES .....15

The article is devoted to the development of an application software for post-processing of total pressure primary transducer data, collected in the result of sensor forward and backward passage in the plane of the cross-section of the flow created by gas-jet devices.

Keywords: gas-dynamic facilities, gas-jet devices, Pito tube, velocity field control, free stream.

Patrushev E.M., Patrusheva T.V., Goldenko D.E.  
DEVELOPMENT OF THE PROGRAM FOR  
NUMERICAL MODELING OF CHAOTIC  
OSCILLATORS .....19

In work mathematical modeling systems for carrying out of numerical researches in nonlinear dynamics have been analyzed. The choice of such systems is essentially limited, taking into account this, an open-source project was created, in which the possibility of calculating chaotic attractors and investigating time series in one application was realized. A software project plan was developed and created, in fact an iterative development model in combination with the methodology of extreme programming. The formulated requirements to the software being created gave grounds to implement the project using an object-oriented approach and design patterns.

Keywords: software, extreme programming, open-source project, object-oriented design approach, design pattern, non-linear systems, chaotic attractors.

Shelkovnikov E.Y., Kirillov A.I., Ermolin K.S.,  
Kiznercev S.R.

ELECTROMECHANICAL MODEL OF  
PIEZOACTUATOR INFORMATION-MEASURING  
SYSTEM FOR RESERCH OF COMPOSITE  
MATERIALS .....24

The article deals with the electromechanical model of the power plant of the information-measuring system. Using the analogy method, the features of piezoactuator application and the influence of the adhesive rigidity with the strain gauge on the generated force are investigated. Recommendations for the manufacture of the power plant are given.

Keywords: piezoactuator rigidity, electromechanical model, elastic modulus, strain.

Krivobokov D.E., Soloviev V.A., Pavlenko A.A.,  
Spirin D.S.

DATA TRANSMISSION ALGORITHM IN LED  
DISPLAYS .....28

Article is devoted to the description of processes and implementation of an algorithm of data transfer in LED tapes. The essential shortcoming hindering wide dissemination of LED tapes for video information display is their unreliable construction. Reliability augmentation is possible due to combining of LEDs not in normal tapes, and in tapes segments, the separate controller will control each of which.

Keywords: display, light-emitting diode, LED, algorithm.

Gulyaev P.V., Tyurikov A.V., Shelkovnikova T.E.  
MECHANIZATION OF THE PROCESS OF BILLET  
POSITIONING OF THE STM PROBE WHEN IT IS  
MANUFACTURED BY ETCHING .....31

The article is devoted to designing a system for STM-probe blank positioning, using inertial piezodrive. It is shown, that usage of inertial piezoelectrical actuator allows to increase capability of the technological system.

Keywords: scanning tunneling microscope, actuator, screw-nut gear, positioning system, piezodrive.

Smirnov S.B., Ordobaev B.S., Abdykeeva Sh.S.  
SOME FEATURES OF SEISMIC WAVE  
DESTRUCTION OF BUILDINGS AND  
STRUCTURES.....34

The article is devoted to the study of the features of seismic destruction of buildings that are contradictory by their nature inertial force concepts.

Keywords: seismic destruction, earthquakes, shock wave concept.

Gorenkov D.V., Patrusheva T.V., Patrushev E.M.  
ON THE APPLICATION OF CHAOTIC DYNAMIC  
SYSTEM ON THE ULTRASONIC SPEED  
MEASURER.....38

In this paper, the principle of ultrasonic speed measurement is considered, which is based on Doppler method of frequency shift measurement between the reflect wave frequency and the incidence wave frequency. Application possibilities of chaotic dynamic system is examined, particularly Duffing oscillator, in the ultrasonic speed measurer.

Keywords: Doppler method, dynamic system, deterministic chaos, phase diagram, signal-to-noise ratio, Duffing oscillator.

Baranov N.S., Bebiya A.G., Chumak S.E.  
MEASURING THERMOELECTRIC SYSTEM FOR  
ENERGY OF ACTIVATION IN OXID BRONZE ....41

A thermocouple cell of the information-measuring system for determining the activation energy of intercalation processes in oxide bronzes is described. The results of measuring the activation energy for TiO<sub>2</sub> and WO<sub>3</sub> oxides are presented for thermally simulated intercalation by K and Na ions in the temperature range from 50 to 600°C.

Keywords: activation energy, electrical conductivity, thermocouple, oxide bronze, SHS.

Pronin S.P., German E.V.  
CONTRAST RESEARCH IN THE VIBRATING PAIR  
STROKES WITH VARIOUS COEFFICIENTS  
OF FILLING .....44

Article is devoted to a research of change of contrast in pair strokes with various coefficients of filling as a result of harmonious vibration. It is theoretically established and are almost received the results demonstrating that with increase in coefficient of filling in strokes there is a negative contrast.

Keywords: contrast, pair strokes, filling coefficient.

Krivobokov D.E., Soloviev V.A., Pavlenko A.A., Spirin D.S.  
INCREASE IN SENSITIVITY OF CONTACTLESS  
INDUCTION PRIMARY MEASURING  
CONVERTER OF SPECIFIC ELECTRIC  
CONDUCTIVITY OF LIQUID ENVIRONMENTS..47

Article is devoted to the problem of increasing the sensitivity of induction devices control the electrical conductivity of liquid substances. One option for increasing sensitivity is to increase the quality of the oscillatory circuit of the sensor that is proposed to implement by reducing parasitic capacitive mutual relations of the turns of the coil inductance through the application of the dielectric layer. Also presents the results of experiments demonstrating the increased sensitivity of the sensor.

Keywords: conductometry, measurement, inductive transducer sensitivity.

Kadirov I.Sh., Borukeev T.S., Kothubai Iskender, Matekova G.D.  
DEVELOPMENT OF THE STRUCTURE OF THE  
SOFTWARE AND HARDWARE FOR MEASURING  
DEVICES BASED ON MICROPROCESSOR  
TECHNICS.....50

The article is devoted to the description of the process of developing the structure of software and the choice of hardware that allows, with the help of a prefix to a personal computer, to measure electrical signals in the control system of an automated electric drive. The Kotel'nikov theorem is the basis of the software developed for the register-based device.

Keywords: automated electric drive, digital signal processing method, hardware and software support, software, digital oscilloscope.

Morgunov Yu.Yu., Yakunin A. G. DEVELOPMENT OF ELECTRONIC PROGRAM- CONTROLLED LOAD FOR VIRTUAL LABORATORY.....	56
--	----

The article is devoted to the development of the electronic load required in the laboratory of the developer of radioelectronic equipment to study the work of various power modules, mainly power supplies. From the known solutions, the proposed device is characterized in that it is oriented to work with a personal computer when the magnitude of the load and the dynamics of its change over time are controlled using interface tools of the virtual laboratory.

Keywords: development of an electronic equipment, force electronics, the virtual laboratory, electronic loading.

Gulyaev P.Y., Omelchenko A.I. COMPARE OF PHOTOTHERMAL PROPERTIES OF OXIDE BRONZES NANOPARTICLES .....	61
---	----

The results of a comparison of the photothermal effect when the erbium laser is irradiated by a phantom of a biological tissue after impregnation with nanoparticles of oxide bronzes  $HxMoO_3$ ,  $NaxTiO_2$ ,  $KxMoO_3$  and  $KxWO_3$  are presented.

Keywords: laser, nanoparticles, photothermal effect, oxide bronzes, SHS.

---

## Part 2

### VIRTUAL AND INTELLIGENT SYSTEMS IN MEDICINE, BIOLOGY AND ECOLOGY

---

Frolov S.V., Frolova T.A. DESIGN OF THE AUTOMATIC STATION FOR SELECTION OF NUCLEIC ACIDS ON THE BASIS OF THE READY ROBOTIZED PLATFORM AND DOMESTIC REAGENTS.....	64
--	----

The article shows the relevance of the introduction of robotic stations for the automation of laboratory processes. The task of designing a typical station for automation of laboratory processes was set, the basic principles of designing a metering station for automation on the basis of a finished robotic platform were analyzed. The selection of components and components of the station for the isolation of nucleic acids was carried out. The problem of automation of isolation of nucleic acids with the help of domestic reagents is analyzed.

Keywords: robotic station, automation of laboratory processes, polymerase chain reaction.

Kochanov P.A., Nadvotskaya V.V. THE DESCRIPTION OF THE ALGORITHM OF THE INTEGRATION MECHANISM AT INTERACTION OF TWO INFORMATION SYSTEMS .....	70
--	----

The article is devoted to solving the problems of interaction of information systems through integration bus. The paper discusses the features of data exchange of medical and laboratory systems of the enterprise, potential software solutions, data exchange formats and data transmission protocols used during the work.

Keywords: medical information system, laboratory diagnostics, Integration bus.

Sobjanin O.S., Pronin S.P. DEVELOPMENT OF THE PROGRAM IN THE ENVIRONMENT OF MATHCAD FOR PROCESSINGS OF DIGITAL IMAGES OF ROENTGENOGRAMS .....	74
---	----

The program of filtering digital images in the environment of MathCad is developed. The advantage of the program is its visualization and an opportunity to set any mask for filtering. The program is approved on the known filters. The program can be used for the educational purposes in educational institutions on discipline "Digital image processing", for carrying out laboratory researches, for training of specialists in the field of medicine.

Keywords: program, spatial filter, digital image.

Kononova E.S., Pronin S.P. REVIEW OF THE MODERN TECHNICAL MEANS MEASUREMENT AND MONITORING OF THE WEIGHED PARTICLES IN ATMOSPHERIC AIR ...	77
---	----

On the basis of directories, the websites and normative documents the state-of-the-art review of new technical means of measurement and monitoring of the weighed particles in atmospheric air is executed. Follows from the review that the modern measuring instruments of the weighed particles are executed by classical gravimetric and optical methods of measurements. At the end of article the non-standard perspective optical method of measurement of mass concentration of the weighed particles is given in atmospheric air on measurement of contrast in the image of a test object.

Keywords: methods of measurement, gages, the weighed particles, mass concentration.

Musuralieva D.N.

DATABASE OF DATA FOR DISTRIBUTION AND ACCOUNT OF NUMBERS OF RODENTS .....81

The database of zoological material allows you to view the analysis of the state of the species composition of rodents, the abundance and distribution of rodents on the territory of the Issyk-Kul basin, as the main vectors of zoonotic infections, dangerous for human and animal life.

Keywords: Database, species composition, rodents, abundance, Issyk-Kul basin.

Grinina K.S., Konyushenko J.S., Moiseeva A.A., Zryumova A.G.

INVESTIGATION OF IMPACT OF CHLORO-ACID MAGNESIUM ON THE MEMBRANE POTENTIAL OF WHEAT GRAINS HIGH INCREASE .....84

The article is devoted to the study of the effect of magnesium chlorate on the membrane potential of wheat of high germination, followed by analysis of membrane permeability with the help of the logarithmic Goldman-Hodgkin-Katz function.

Keywords: membrane potential, membrane permeability, magnesium chlorate.

Barysheva N.N., Gudkov P.A.

CHANGES IN MEMBRANE POTENTIAL OF WHEAT GRAINS BY AN ELECTRIC CURRENT..88

The article is devoted to the study of changes in the membrane potential of wheat grains under the influence of various external factors. The article already includes proven dependencies to facilitate the study of other dependencies.

Keywords: membrane potential, rest potential, action potential, wheat grains, factors of influence, mechanical action, electrical effect, temperature change, ion concentration.

Zryumova A.G., Zryumov E.A., Sapozhnikova Y.I.

INVESTIGATION OF THE DISTRIBUTION OF NANOPARTICLES OF CARBON IN THE FROZEN DROP OF WATER BY THE OPTICAL METHOD OF CONTROL .....91

The article is devoted to the study of the distribution of carbon nanoparticles in a drop of distilled water frozen with the help of the Peltier element with the subsequent analysis of the surface pattern formed by the Benard cells.

Keywords: optical method of control, carbon nanoparticles, Sobel filter, Benard cells.

## Part 3

### VIRTUAL AND INTELLIGENT SYSTEMS IN ENSURING INFORMATION TECHNOLOGIES

Koldin I.Y., Suchkova L.I.

CREATION AND STORAGING COMPACTIFICATION OF GEOMETRICAL PATTERNS OF PSEUDO-PERIODIC DATA .....95

The article is devoted to algorithms for processing monitoring data on the basis of geometric patterns. It describes the selection of periodic parts, the creation of geometric patterns, the storage of the base of patterns in the structure of PGG.

Keywords: Processing monitoring data, the geometric pattern, PGG.

Shevelyova A.G., Staroletov S.M.

CONSTRUCTION A PROCESS OF DEVELOPMENT AND TESTING OF INTELLIGENT INFORMATION PROCESSING SYSTEMS BASED ON THE METODOLOGY MDD .....99

In this article we propose the application of the MDD (Model Driven Development) software development methodology to create reliable intelligent information processing systems

Keywords: quality control, model-driven development, software engineering.

Bruches E.P., Krayvanova V.A.

PLACE NAMES DISAMBIGUATION BASED ON CONTEXTS FREQUENCY ..... 103

In this paper we consider named entity disambiguation, particularly for place names. To solve this problem we propose statistical approach which is based on using only potential place names contexts. For our implementation of this method no annotated corpora are required, each step of the algorithm is easy to interpret (unlike machine learning algorithms) and its results are satisfactory for practical usage over big data in information retrieval.

Keywords: Toponyms extraction, text mining, disambiguation.

Shabashov V.Ya.

PHP SOFTWARE FRAMEWORK DEVELOPMENT ..... 106

The article is devoted to the development of high-performance lightweight PHP Framework intended to facilitate software engineering for information

## CONTENTS & ABSTRACTS & KEYWORDS

systems.

Keywords: PHP, framework, Web application, AJAX, JavaScript.

Ivchenko S.P., Suchkova L.I.

PROCESSING OF GROUP OF INDISTINCT TIME SERIES USING TEMPORAL GRAMMAR..... 111

Article is devoted to algorithm elaboration and implementation of a technique of detection of regularities in group of time series by means of grammar of a special look and also development of means of formalization of representation of analysis results.

Keywords: data analysis, temporal grammar, indistinct row.

Krayvanova V.A.

INSTRUMENT FOR WORK WITH WIKIPEDIA DUMPS FOR COMPUTER LINGUISTICS TASKS ..... 115

In the article, we analyze the existing capabilities for working with Wikipedia as a text corpus, and suggest an automated instrument of obtaining text corpora based on Wikipedia for various tasks of computer linguistics.

Keywords: linguistic corpus creation instrument, Wikipedia, automatic text analysis.

Smykova N.V., Pyatkovsky O.I., Zvekov N.A.

DETERMINATION OF THE IMPORTANCE OF PERSONAL QUALITIES FOR THE ASSESSMENT OF WORK APTITUDE BY THE EXPERT ASSESSMENT METHOD ..... 121

The article is devoted to the determination of the importance of certain personal qualities for assessing the work aptitude of a graduate of a university. This task is solved by the method of expert assessments.

Keywords: personal qualities, Cattell questionnaire, expert assessments, professional selection.

---

### Part 4

#### VIRTUAL AND INTELLIGENT SYSTEMS IN THE INDUSTRY, CONSTRUCTION, ECONOMY

---

Kotlubovskaya T.V., Menyakin V.A.

DEVELOPMENT OF THE AUTOMATED INFORMATION MEASURING SYSTEM FOR COKE SUPPRESSION PRODUCTION CONTROL ..... 124

The article is devoted to development of an automated information measuring system for production control of suppression of coke on the example of monitoring

and pressure control under the arch forkamer.

Keywords: coke suppression, the circulating gas, the microcontroller, automated information measuring system.

Arzybaev A.M.

DEVELOPING THE METHOD OF PROJECTING FOR OPTIMAL TECHNOLOGICAL PROCESS MANUFACTURING PARTS..... 129

Described problems in the design process. We propose an method for the production of technological transfer surfaces, which includes a best technological solutions.

Keywords: Design process, modul, tool-mashin, tools.

Krasnova M.V.

CUSTOMER RELATIONSHIP AUTOMATISATION IN SMALL CONSTRUCTION BUSINESS COMPANY ..... 132

The article is focused on the to problems of automation in small and micro-businesses solving. The construction company was taken as an example to show that the use of artificial intelligence techniques can significantly improve the efficiency of business processes and customer interaction.

Keywords: expert system, small and micro-businesses, customer relationship.

Blem A.G., Brytova E.A.

IMITATION MODEL OF MORTGAGE-ACCUMULATIVE CREDITING..... 136

The article is devoted to the analysis of the effectiveness of mortgage lending schemes.

Keywords: imitation model, mortgage-accumulative crediting, consumer cooperative.

Zhukovsky M.S., Khodin M.A.

RESEARCH OF DIFFERENCE IN PREDICTABILITY OF DIVIDEND AND NONDIVIDEND RUSSIAN STOCKS..... 140

The article is devoted to the study of the difference of dynamics of selected Russian shares with dividends and without ones.

Keywords: Effective market hypothesis, predictability, stock market.

---

### Part 5

#### VIRTUAL AND INTELLIGENT SYSTEMS IN SAFETY

---

Lerke V.V., Nadvotskaya V.V.

## DEVELOPMENT OF SECURITY AND FIRE ALARM SYSTEM FOR THE TWO-STORAGE BUILDING OF A FOOD STORE .....142

The article is devoted to the development of security and fire systems to ensure the safety of the building. In the article questions of studying of the object of protection, the selection of hardware fire and security systems.

Keywords: Security-fire alarm, regulatory documents, detectors, general technical requirements, computer-aided design AutoCAD MEP.

Shirin A.E., Yushkova V.B.

## THE DEVELOPMENT OF THE SYSTEM SECURITY ON THE MACHINE "MASTER 34" COMPUTER NUMERICAL CONTROLLING .....145

The article is devoted to the development of additional security measures when working with CNC "Master 34". Additional protection is achieved by using light barriers. This upgrade does not affect the operation of the machine, and does not cause difficulties during installation and provides the necessary level of protection against injury.

Keywords: modernization, photocell, safety, protective screen, optical sensor.

Volkov N.S., Nadvotskaya V.V.

## THE HARDWARE SECURITY SYSTEM OF A CONSTRUCTION SHOP .....148

The article is devoted to hardware security and fire systems. In the article questions of studying of the object of protection, determine the type of systems in use, hardware security and fire subsystems and the performance of each element.

Keywords: security and fire system, false alarms, a remote control, standby power supply, the boundaries of protection of object.

Kalinichenko O.V., Zryumov P.A.

## DEVELOPMENT OF THE PERSONAL COMPUTER USER'S FATIGUE CONTROL SYSTEM .....152

The article describes the problem of controlling human fatigue. Areas of application of machine vision, in particular the use of face recognition, are considered. As a result, it was suggested that the development of a fatigue monitoring system for a user of a personal computer using face recognition is promising.

Keywords: facerecognition, Haarcascade, fatiguecontrol, machinevision.

Kachesova L.Y., Yurchenkov A.S.

## SOFTWARE DEVELOPMENT ASSESSMENT AND FORECASTING OF TECHNOGENIC RISK OF ELECTRIC FACILITIES. .... 155

Propose software for the calculation of the integrated risk of a particular man-made hazards electrical facilities. The software implements the operations propositional temporal logic "sometimes in the past" and "always in the past", which are used to describe temporal dependencies between risk factors and technogenic risk. Integral risk are calculated using the algorithm of Mamdani fuzzy inference.

Keywords: electrical facilities, technogenic risk, emporal logic, fuzzy inference.

Gubin D.D., Nadvotskaya V.V.

## ANALYSIS OF THE HARDWARE SYSTEM OF FIRE ALARM SYSTEM FOR A SINGLE STORE ..... 158

The article deals with the design features of various types of fire alarm systems currently in use. In accordance with the specifics of the building and the design and installation standards, a selection of fire detection sensors for a fire alarm project is made.

Keywords: fire alarm system, emergency, flame detectors, smoke detectors.

---

### Part 6

#### VIRTUAL AND INTELLIGENT SYSTEMS IN STUDENT'S WORKS

---

Chueshe A.V.

## DISTRIBUTED HIGHLOAD ARCHITECTURE DESIGN FOR CLOUD COMPUTING IN THE SPHERE OF IoT ..... 161

The article describes the design and the possibility of using the cloud infrastructure as a distributed and virtualized group of services for parallel processing and analysis of huge volumes of data in the sphere of IoT.

Keywords: distributed architecture, cloud computing, microservice architecture, event-driven architecture.

Ershova E.V. , PatrushevE.M., Patrusheva T.V.

## ON THE APPLICATION OF THE CHAOTIC OSCILLATOR FOR THE MEASUREMENT OF RANGE ..... 165

The article is devoted to the use of the chaos generator in the design of the distance measurement sensor in robotics. The problem of simultaneous

## CONTENTS & ABSTRACTS & KEYWORDS

operation of several robots in close proximity to one another have identified. It's shown that a sequence of maximum length can be used, although the best solution will use a chaotic signal, because, unlike sequences of maximum length, the chaotic oscillator can generate an infinite number of chaotic signals, while no additional modulation is required. The dignity of the chaotic oscillator lies precisely in chaos. Since such a technology to date is not at all well understood, it requires further research on this issue.

Keywords: chaotic oscillator, measurement of range.

Kotlubovskaya T.V., Kotlubovsky I.A., Klukina M.V.

DEVELOPMENT OF THE PROJECT OF EXPRESS QUALITY CONTROL BRIQUETTES FROM FERROALUMINIUM IN THE PRODUCTION PROCESS.....167

The article is devoted to development the express - techniques of quality control of briquettes from ferroaluminium in the course of their production.

Keywords: briquette from ferroaluminium, the weight, express quality control.

Kuznetsov A.A., Afonin V.S., Zabelyayev R.A., Diakin R.A., Zryumova A.A.

ORGANIZATION OF INFORMATIVE COOPERATION OF ELEMENTS OF SYSTEM "SMART HOME" .....170

In the article the question of organization of communication channel is considered between devices with the use of the standardized interface devices and protocols. Such channels are used for organization of the of communication systems, including in the systems "smart home".

Keywords: "smart home", interface devices, communication channel, communication of data, protocol of connection, model OSI.

Osokin Yu.A, Kochetkov I.N., Cheremisin A.V.  
TEMPERATURE LATENT HEATING IN AND DRYINING RAW MATERIAL .....173

Latent heat is energy released or absorbed, by a body or a system during of process temperature heating and dryining raw material.

Keywords: latent heat is energy, temperature, heating, dryining raw material.

Nadvotskaya V.V., Kadirov R.V.

ANALYSIS OF LOGISTIC SYSTEMS AND SOFTWARE NECESSARY FOR IMPLEMENTATION OF THE CONTROL SYSTEM OF THE LOGISTIC

PROCESS OF THE TOURISTIC ENTERPRISE ..... 176

The article is devoted to the analysis of logistics systems and software, with the help of which it is possible to implement a system for monitoring the logistics process of the tourism enterprise.

Keywords: logistics, business travel, information control, development environment, structure of the logistics system.

Pervukhin B.S., Tyurkin V.S., Sopin V.A.

STATE AND PROSPECTS OF DEVELOPMENT OF MEANS METROLOGICAL SUPPORT KONDUKTOMETRICHESKY ANALYZERS OF LIQUID ..... 179

On the basis of the analysis of need of the industry and the current state of metrological support of conductometric analyzers of liquid the way of enhancement of means of their metrological support is offered.

Keywords: conductometer, standard, methodical error, impedance of electrodes, conductive constant.

Osokin Yu.A, Shebalin K.S.

TEMPERATURE HEATING IN REA ..... 183

The article is devoted to the optical infrared spectroscopy of temperature heating in REA.

Keywords: optical, infrared, spectroscopy, temperature, heating in REA.

Nadvotskaya V.V., Semina Y.V.,

PROSPECTS FOR THE USE OF WIRELESS TECHNOLOGIES FOR OIL FIELD EQUIPMENT IN THE CASE OF INJECTION WELLS OF RESERVOIR PRESSURE MAINTENANCE ..... 186

The article is devoted to modern state of the problem of the oil extraction process, a brief analytical review of the main used equipment; the proposed wireless solution for the transmission of measurement information to control the flow of liquid working agent in the injection well and reservoir pressure maintenance oil fields.

Key words: oil extraction, injection well, reservoir pressure maintenance, pressure sensors, operator's, wireless technology.

Osokin Yu.A., Uspek A.V.

TRANSMISSION AND RECEIVING VIDEO SIGNALS WITH VARIOUS VOLUME ..... 189

The article is devoted to the researching of problems of fast and reliable transmission and reception of video information taking into account the dynamic

characteristics of signals. It has experimentally established that at increase in pulse duty factor of signals at simultaneous increase in pulse power within so-so integrated rated loads of power sources speed of perception of information increased.

Keywords: transmission, video information reception, response characteristics of signals, on-off time ratio, frequency.

Zryumov P.A., Shumarin O.O.

THE DEVELOPMENT OF THE MOBILE SYSTEM OF CONTROLLING LINEAR SIZES WITH ELEMENTS OF AUGMENTED REALITY.....192

The article is devoted to methods and instruments for measuring the geometric dimensions of objects used in construction, design and everyday life. It addresses the main disadvantages of existing measurement methods and describes the developing measuring system that produces a measurement on the image.

Keywords: measurement method, image processing, mobile technologies.

Pronin S.P., Umbetov S.V.

MODELIROVNIYE AND RESEARCH METAL CORROSION PROCESS.....195

In article process of modeling of corrosion of metal in the pipeline under the influence of the acid environment is described. At an insignificant deviation from real corrosion this modeling will allow to prepare enough test samples with various extent of corrosion for obtaining test images. Test images allow to create an algorithm of recognition of corrosion damages by a photometric research of samples by means of the video camera of the color image.

Keywords: corrosion, modeling, photometric research, video camera. Kommersant.

Kotlubovskaya T.V., Kotlubovsky I.A., Lelechenko I. V.

RESEARCH OF DEPENDENCE OF ELECTRIC RESISTANCE OF THE BRICK RAW ON HUMIDITY OF MIX .....198

The article is devoted to a research of dependence of electric resistance of a brick raw on humidity of mix.

Keywords: humidity of a concrete brick raw, electric resistance, express quality control.

Zryumova A.G., Afonin V.S., Hacko D.I.

PRINCIPLES AND TECHNOLOGIES OF BUILDING A "SMART HOUSE" .....202

The article is devoted to the principles and technologies of developing and building a "smart home", examines the requirements for hardware and software for building a "smart home".

Keywords: "smart house", automation, sensors, control.

Afonin V.S., Pervuhin B.S., Selivanova A.S., Kolipov K.S.

INSTRUMENTAL ADC ACCURACY AT THE DEFINITION OF PARAMETERS OF TRANSITION PROCESSES ..... 206

The article substantiates the appearance of an error in determining the parameters of transient processes by means of an ADC. Calculations are made that relate the sampling frequency of the ADC and the error in determining  $\tau$ .

Keywords: transient, analog-to-digital converter, sampling frequency, capacitive converter.

Kotlubovskaya T.V. Golosov A.V.

APPLICATION OF NOZZLES SPRAY JETS IN SYSTEMS OF AUTOWATERING AND SURFACE HUMIDIFICATION OF ORNAMENTAL EXOTIC HOUSEPLANTS..... 208

The article is devoted to application of special nozzles - spray jets in systems of the automated watering and the surface humidification of ornamental exotic houseplants.

Keywords: humidity control, exotic houseplants, system of the automated watering, nozzles - spray jets.

Rubtsov I.N., Nadvotskaya V.V.

RESEARCH AND CHOICE OF THE CENTRAL UNIT FOR THE CONTROL SYSTEM "SMART HOUSE" ..... 211

The article is devoted to the study and selection of the central unit for the control system "smart house". In work the analysis of central control of devices used in existing systems, the proposed alternative device is a block diagram of the system of "smart home" scenarios work.

Keywords: control system, smart home, programmable logic controllers, motion sensors and temperature, multi-functional Arduino Board.

Demenko A.M., Tushev A.N.

DEVELOPMENT OF THE CONCEPTUAL MODEL OF APPLICATION OF AUTOMATIC ANALYSIS AND CORRECTION OF DEFECTS OF PHOTOGRAPHS FOR MOBILE DEVICE ..... 214



## CONTENTS & ABSTRACTS & KEYWORDS

The article is devoted to the development of a conceptual model for the application of automatic analysis and correction of photo defects for a mobile device controlled by the OC Android.

Keywords: Application, conceptual model, photo processing.

Chepushtanov A.A., Komarov G.A.

ANALYSIS OF POSSIBILITY AUTOMATION OF TECHNOLOGICAL PROCESSES AT THE ENTERPRISE JSC "Altaivagon" .....217

The article is devoted to optimization of technological processes at JSC "Altaivagon".

Keywords: automation, planning stages.

Padalko V.S., Zryumov E.A.

COMPENSATION OF THE VARIABILITY OF LIGHT TRANSMISSION OPTICAL FIBERS OF THE DYNAMIC TEST-OBJECT .....220

The article is devoted to the development of a method for equalizing the luminescence brightness in the screen of a dynamic test object. The possibility of software brightness adjustment is considered. The graphs of contrast and standard deviation of brightness in the recorded image of a dynamic test object are given.

Keywords: vibration, dynamic test object, contrast, adjustment.

Pervuhin B.S., Sopin V.A., Tyurkin V.S.

THE USE OF DYNAMIC PROCESSES FOR DETERMINATION OF THE UNIT ELECTRICAL

CONDUCTIVITY OF LIQUIDS ..... 223

Based on the analysis of the needs of the industry and current state of metrological provision of conductometric analyzers of liquid suggested path to improve their metrological support.

Keywords: unit electric conductivity, primary converter, transition function, capacitor, capacitance, constant of the primary converter.

Chepushtanov A.A., Strelec E.V.

ANALYSIS OF AUTOMATED CONTROL OF TECHNICAL DOCUMENTATION IN INSTRUMENT ENGINEERING ON THE BASIS OF PDM-SYSTEMS..... 226

The article is devoted to automation control technical documentation in the field of instrumentation.

Keywords automated control systems technical documentation, PDM – system.

Kovalev R.E., Zryumova A.G, Zryumov P.A.

MANAGEMENT OF THE "SMART HOUSE" SYSTEM THROUGH THE MOBILE DEVICE WITH THE ACCOUNT OF THE GEOPHYSICS OF THE USER FOR THE MANAGEMENT OF THE HEATING IN THE ROOM..... 228

The article is devoted to the development of the "smart house" system, taking into account the geolocation of users of the system in space based on the HomeDeMo system of home automation.

Keywords: smart house, geolocation.

## ПРАВИЛА ОФОРМЛЕНИЯ СТАТЬИ

Статья объемом 5 страниц, имеющая индекс УДК, аннотацию из 2-3 предложений и ключевые слова на русском языке (в начале текста статьи) с приложением перевода названия, аннотации, ФИО авторов и ключевых слов на английский язык, а так же сведений об авторах (ученой степени, звания и места работы, E-mail и/или контактного телефона) должна отвечать следующим требованиям:

Работы принимаются в текстовом редакторе Microsoft Word версии не ниже 97.

В диалоге “Файл – Параметры страницы” используется размер бумаги формата А4, ориентация листа книжная. Поля: верхнее – 3,5 см; нижнее – 2,7 см; левое – 2,5 см; правое – 2,5 см; переплет – 0 см; колонтитул от края: верхний – 1,25 см; нижний – 2,3 см.

В диалоге “Формат – Колонки” выбирается расположение текста в “две” колонки, устанавливается ширина колонок – 7,65 см, промежуток между ними – 0,7 см.

Названия статей набираются прописными буквами (шрифт “Tahoma”, размер шрифта текста – 14 пунктов, полужирный). Инициалы и фамилии авторов размещаются под названием статьи (шрифт “Tahoma”, размер шрифта текста – 12 пунктов, полужирный). Ниже фамилии автора указывается учебное заведение и город (шрифт “Tahoma”, размер шрифта текста – 11 пунктов). Вышеперечисленные данные располагаются по всей ширине страницы (по центру).

Для основной части используется шрифт под названием “Arial”, размер шрифта основного текста – 10 пунктов, красная строка – 0,8 см, интервал между строками “одинарный”. Нумерация страниц производится шрифтом размером “Arial”, 12 пунктов, наклонный. Расположение нумерации – внизу страницы (в нижнем колонтитуле), снаружи.

В диалоге “Файл – Параметры страницы – Макет” включить “Различать колонтитулы” – первой страницы и чётных и нечётных страниц.

В верхнем колонтитуле указывается: на чётных страницах – инициалы и фамилия автора (Tahoma, 10 пунктов, прописные); на нечётных страницах – название статьи (главы) (Tahoma, 10 пунктов, прописные).

Список литературы набирается шрифтом “Arial”, размером – 9 пунктов. Ссылки на литературу в тексте статьи – в квадратных скобках.

Для создания формул и таблиц используются встроенные возможности Word. Рисунки цифрового формата (в электронном виде) создаются средствами Word или другими программами в черно-белом виде.

Размеры рисунков не должны превышать границы полей страницы основного текста документа с учетом подрисовочной подписи. Рисунки издательством не редактируются. Если рисунок по ширине превышает размер колонки, то необходимо ставить перед ним и после него разрыв раздела на текущей странице и располагать рисунок в начале или в конце страницы.

Рисунки, надписи и объекты Word 97 должны перемещаться вместе с текстом, т.е. быть не поверх текста

При приеме работы в печать обязательно наличие твердой копии! Кроме того, обязательна внешняя рецензия, подписанная доктором наук, экспертное заключение.

Плата с аспирантов не взимается.

контактная информация

тел. 8-3852 29-07-44

почта gen195@mail.ru

Суханкин Геннадий Владимирович