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A.S. Akutin, A.V. Brovko

SELF-SOVEREIGN IDENTITY SYSTEM BASED ON BLOCKCHAIN-BASED REGISTRY

Abstract. *Development of modern distributed applications and blockchain technology allow for users to create new types of identity management systems. In most of information systems data storage issues are resolved by developers of certain information system based on their resources. In the article we are looking for new ways to store user data that will allow clients manage their own data. In the given research we present the basic implementation of the self-sovereign identity system that can serve as the basis for creating information systems with high complexity. A standard mechanism could store data and sign documents*

Keywords: *decentralized, user-centric identity based encryption, blockchain, Self-Sovereign Identity System*

S.A. Ignatiev

SYSTEM APPROACH TO INFORMATION SYSTEMS IN HEALTHCARE AND MEDICAL EDUCATION

Abstract. *The article deals with application of system approach to the development of medical information systems for medical and preventive treatment institutions organized as interconnected subsystems which may be affected by the functionality.*

Keywords: *medical information system, system approach, classification, subsystems*

E.E. Mirgorodskaya, N.P. Mityashin, Yu.B. Tomashevskiy, M.K. Magomedova, R. Gubaidulin

A METHODOLOGY FOR AUTOMATED ASSESSMENT OF APPLICANTS COMPERING FOR VACANT POSTS

Abstract. *The presented methodology for automated selection of candidates to fill a vacancy is based on the vectorial analysis. The suggested solution to the problem has a multi-vector format with subsequent scalarization. The authors consider a practical example*

of the implemented program developed to assess a candidate's qualification and suitability as an electrical engineer in a computer class of a university.

Keywords: *vector optimization, scalarization, criterion, rank, decomposition*

P.V. Simonov, A.A. Ignatiev

NONDESTRUCTIVE TESTING TECHNIQUES USED TO DETERMINE CRACKS IN CRANKSHAFTS

Abstract. *The considered basic techniques for nondestructive testing are used in diagnosing crankshafts. The authors provide and compare their advantages and disadvantages, including possibilities for automation of each technique.*

Keywords: *nondestructive testing, capillary control, ultrasonic method, magnetic powder method, vibroacoustic method, defects, crack*

B.L. Fayfel

A WAY TO CALCULATE FIBONACCI NUMBERS USING BINET'S FORMULA

Abstract. *The article describes an algorithm for direct calculation of Fibonacci numbers using Binet's formula without the floating point arithmetic in O (log n) time. The Python programming language is applied to implement the given methodology.*

Keywords: *Fibonacci numbers, Binet's formula, Python*

A.V. Zhukov, A.A. Nikiforov, A.S. Yakovishin

PLASTIC MATERIALS FOR ADDITIVE TECHNOLOGIES (review)

Abstract. *The article provides an overview of plastics for FDM-printers, which are widely used both in industry and household printing. Plastics such as ABS, PLA, PVA, nylon and other polymers are the main materials in the AM market. Creation of new materials is an urgent problem, since every year new physicochemical requirements are imposed on them. Demand for higher standards of plastic materials is due to the fact that the scope of application of parts made using FDM-technology is expanding, and the use of existing materials is more widespread in our daily life. Namely, parts made with the use of AT are*

used not only in mechanical engineering, but also in other industries, due to cheap raw materials, their availability and possibility of further waste-free processing.

Keywords: *additive technologies, prototyping, filament, 3D-printing, ABS, PLA, PVA, nylon, polycarbonates, polyethylene, polypropylene, polycaprolactone, polyphenylsulfone, polymethul methacrylate, polyethylene terephthalate, polystyrene*

T.G. Nasad, I.P. Nasad, K.T. Sherov

METHODOLOGY FOR ANALYSIS OF TEMPERATURES IN THE CUTTING ZONE WHEN PROCESSING HARD-TO-MACHINE MATERIALS

Abstract. *The article considers the methods applied to determine the temperatures in the cutting zone. It has been revealed that analytical methodology can be most effectively used to determine effects of the thermal influence on formation of microgeometric properties under processing hard-to-machine materials.*

Keywords: *forming, hard-to-machine materials, technical characteristics, thermal processes*

O.A. Markelova, S.Ya. Pichkhidze

STRUCTURAL, MORPHOLOGICAL AND MECHANICAL CHARACTERISTICS OF PLASMA COATINGS BASED ON CALCIUM PHOSPHATE METAL-CONTAINING POWDERS

Abstract. *The surface microstructure of plasma coatings based on metal-containing calcium phosphates has been studied by metallography and scanning electron microscopy. The size of agglomerates and individual particles are determined. It has been established that the coatings consist of molten particles of 50-150 microns in size, the particles form agglomerates with the size of 150 microns or more. The plasma spraying modes for calcium phosphates metal-containing powders included the following: the arc current of the plasma torch of 300-350 A, the spraying distance of 50-100 mm, the powder dispersion up to 90 microns, the flow rate of the transporting gas of 5-7 l/ min, allow formation of a uniform coating having sufficient adhesive strength.*

Keywords: *plasma spraying, coating, metal-containing calcium phosphates*

E.T. Seferaliev, A.R. Davydova, E.V. Barabanova, I.Yu. Gots,
V.O. Lukyanova, S.N. Barabanov

DEPENDENCE OF MICROHARDNESS OF THE AL-CE-H ALLOY OBTAINED BY THE METHOD OF CATHODIC HYDROGEN SATURATION UNDER VARIOUS TEMPERATURE CONDITIONS

Abstract. *Microhardness studies have been carried out for the Al-Ce-H alloy. Hydrogen saturation into the aluminum matrix was made at the temperatures -20° C, 0° C, 20° C, and 50° C. Dependence of density on the depth of indentation of the indenter at the loads of 0,196N, 0,294N, 0,392N, and 0,49N, respectively, was revealed. In the course of the study it was found that the density of the surface of the alloy obtained at the temperatures of 50° C, 20° C, and 0° C grow, whereas at -20° C the density indicators fall.*

Keywords: *micro-hardness, aluminum alloy, cathodic incorporation, indentation depth, density*