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Some Applications of Cellular Automata in Learning Systems Constructions

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Abstract

Today the von Neumann invention of cellular automata is one of important tools of artificial intelligence researches. Cellular automata show their usage in simultaneous calculations, creating data bases and simulating physical processes. The goal of this article is to introduce to the learning system called CELLS, which manner of working is directly connected with the cellular automata evolution rules.

2. **Bryll Grzegorz, Kaptur Marcin**
Some Propositional Calculus Oppositional with Respect
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Some Propositional Calculus Oppositional with Respect to the Intuitionistic Propositional Calculus

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Abstract

A fragmentary system of the classical propositional calculus, in which the law $CNN\alpha\alpha$ is valid instead of the law $C\alpha NN\alpha$, is presented.

3. **Bryll Grzegorz, Kaptur Marcin**
About Two Different Ways of Characterization of
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About Two Different Ways of Characterization of Łukasiewicz's Three-valued Modal Propositional Calculus

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Abstract

In this article we consider two systems of Łukasiewicz's three-valued modal propositional calculus. One of them is the system based on such primary terms as the disjunction (A), negation (N) and necessity (L), whereas the second is based on such primary terms as the implication (C), negation (N) and definitively improved by modal necessity terms. The both systems are definitively equivalent.

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Generalized Integral Means Preserving Convexity of Higher Orders

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Abstract

Some generalizations of the classical integral means are characterized. Such type characterizations are obtained by requiring that the corresponding integral operator preserves given function classes.

5. Domańska Katarzyna
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On Associative Rational Functions

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Abstract

We deal with the following problem: which rational functions of two variables are associative? We shall determine all of them provided that at least one of the coefficients in question vanishes.

6. Ger Roman

Sublinear Functionals and Weak*-compactness67

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Sublinear Functionals and Weak*-compactness

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Abstract

Let X be a real locally convex linear topological space. A functional $f : X \rightarrow \mathbb{R}$ is called *sublinear* provided that f is sub-additive and $f(nx) = nf(x), x \in X, n \in \mathbb{N}$. We establish a one-to-one correspondence between the collection of all sublinear functional satisfying some mild regularity conditions and the family of all nonempty convex and weakly*-compact subsets of the dual space X^* .

7. Grygiel Joanna
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W-irreducible Lattices

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Abstract

A finite lattice is W-irreducible if it cannot be split into two overlapping lattices, one of them being an ideal and the other a filter of the lattice. We give some characterization of finite W-irreducible lattices.

8. **Kurkowski Mirosław**

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A State Transition Model for Honest Executions of Authentication Protocols

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Abstract

Cryptographic protocols are very good tools to achieve authentication in large distributed computer network. These protocols are precisely defined sequences of action (communication and computation steps) which use some cryptographic mechanism such as encryption and decryption. It is well known that the design of authentication cryptographic protocols is error prone. Several protocols have been shown flawed in computer security literature. Due to this it is necessary to have some methods of analysis and properties verification of these protocols. In investigations of these properties a suitable formal model is needed. This model should express all important properties and ideas of protocols. In this paper we propose a new formal model of "honest" executions of cryptographic authentication protocol. We hope that this model is a good startpoint for further investigations and will be useful in verification of real executions of cryptographic protocols.

9. **Medvedev Gennady**
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Calculation of Functionals Based on Large Dimension Matrixes in Maximal Likelihood Problems

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Abstract

The problem of the likelihood function calculation is examined at parameter estimation of the stochastic process describing change of interest rates in the financial market. Such problem arises, when it is supposed, that process is not usual diffusion process, but possesses continuous derivatives. In this case the increments of process become correlated, and for the likelihood function evaluation it is necessary to invert a matrix of the high order equal to sample size. As is known the calculation of reciprocal matrixes of the high order either is impossible or results in essential mistakes of calculation. In paper the way to avoid this difficulty is offered.

10. **Povstenko Jurij**

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Modeling of Crystal Defects in Nonlocal Elasticity: A Review

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Abstract

A review of studies concerning models of crystal defects in solids is presented. The emphasis is on describing imperfections in nonlocal elastic continuum. Nonlocal theory reduces to the classical theory of elasticity in the long wave-length limit and to the atomic lattice theory in the short wave-length limit.

11. **Tikhonenko Oleg, Ziółkowski Marcin**
Queueing Systems with Common Memory Space 131

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Queueing Systems with Common Memory Space

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Abstract

In present paper we investigate queueing systems of different types with customers having some random space requirements, connected via common memory space. For such systems combinations we determine stationary loss probability and the distribution of customers present in each system.