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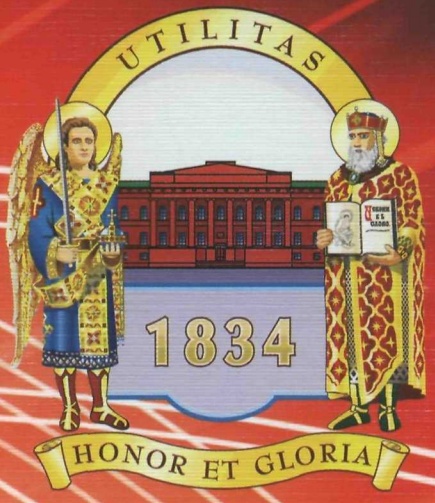

INTERNATIONAL CONFERENCE

MODERN STOCHASTICS: THEORY AND APPLICATIONS III

September 10-14, 2012, Kyiv, Ukraine

CONFERENCE MATERIALS

TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV

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Dedicated to 100th anniversary of B.V. Gnedenko and 80th anniversary of M.I. Yadrenko

September 10-14, 2012, Kyiv, Ukraine

CONFERENCE MATERIALS

Organized by

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Glushkov Institute of Cybernetics of National Academy of Sciences of Ukraine

National Technical University of Ukraine "Kiev Polytechnical Institute"

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and the *probabilistic approximation complexity*

$$n_d^{pr}(\varepsilon,\delta) := \min\Big\{n\in\mathbb{N}: \mathbf{P}\left(\|X_d - X_d^{(n)}\|_{2,d}^2 > \varepsilon^2\,\mathbf{E}\,\|X_d\|_{2,d}^2\right)\leqslant\delta\Big\}.$$

They are investigated under the assumption $\sum_i(-\ln\lambda_i)^2\,\lambda_i<\infty$ in the paper [1]. Suppose $\sum_{i:\,\lambda_i<e^{-x}}\lambda_i\sim C\,x^{-\alpha}$, $x\to+\infty$, where $\alpha\in(0,2)$ and the constant $C>0$; we prove that for any fixed $\varepsilon\in(0,1)$ and some extremely mild conditions on the level $\delta=\delta(d)$, we have $\ln\big(n_d^{avg}(\varepsilon)/n_d^{pr}(\varepsilon,\delta)\big)=o(d^{1/\alpha})$ as $d\to\infty$.

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RANDOM FIELDS: M. YADRENKO'S CONTRIBUTION AND RECENT TRENDS

Yu.V. Kozachenko[1], O.I. Klesov[2]

A survey of Yadrenko's results in the area of random fields is given. Some recent developments of his ideas are discussed.

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SPACES OF RANDOM VARIABLES $\mathbf{F}_\psi(\Omega)$

Yu.V. Kozachenko[1], Yu.Yu. Mlavets[2]

The spaces of random variables $\mathbf{F}_\psi(\Omega)$ are considered. These spaces were introduced in [1]. The properties of these spaces and the properties of random processes of these spaces are studied. Results are used to calculate integrals by Monte Carlo method with a given accuracy and reliability. In particular, the conditions under which the space $\mathbf{F}_\psi(\Omega)$ has the property **H** [2] are found and estimates of distribution of supremums of these spaces are researched.

Theorem 1 ([2]). *Let $X(t)$ – separable process on $(\mathbf{T},\rho)$ of space $\mathbf{F}_\psi(\Omega)$ and the condition holds $\sup\limits_{\rho(t,s)\leq h}\|X(t)-X(s)\|_\psi\leq\sigma(h)$, where $\sigma(h)$ continuous monotonically increasing function such that $\sigma(0)=0$. If, for any $\varepsilon>0$ the next condition holds $\int\limits_0^\varepsilon\varkappa\left(N\left(\sigma^{(-1)}(u)\right)\right)du<\infty$ then $\sup\limits_{t\in\mathbf{T}}|X(t)|\in\mathbf{F}_\psi(\Omega)$ and $\left\|\sup\limits_{t\in\mathbf{T}}|X(t)|\right\|_\psi\leq B(p)$, where $B(p)=\inf\limits_{t\in\mathbf{T}}\|X(t)\|_\psi+\frac{1}{p(1-p)}\int\limits_0^{\gamma p}\varkappa\left(N\left(\sigma^{(-1)}(u)\right)\right)du$, $\gamma=\sigma\left(\sup\limits_{t,s\in\mathbf{T}}\rho(t,s)\right)$, $\varkappa(n)$ – majorant characteristic of $\mathbf{F}_\psi(\Omega)$. Then for any $x>0$ the inequality holds*

$$P\left\{\sup_{t\in\mathbf{T}}|X(t)|>x\right\}\leq\inf_{u\geq1}\frac{B^u(p)(\psi(u))^u}{x^u}.$$

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