

*180th Anniversary of the Taras Shevchenko
National University of Kyiv*

*Taras Shevchenko National University of Kyiv
(Faculty of Cybernetics)*

University of Defence, Brno, Czech Republic

International Institute for Applied Systems Analysis (Austria),

Glushkov Institute of Cybernetics of NAS of Ukraine

*System Analysis Committee of Presidium National Academy of
Sciences of Ukraine*

Academy of Sciences "Vyshcha Shkola" of Ukraine

Noosphere Ventures Corporation

Brno Local Chapter of Union of Czech Mathematicians and Physicists

XXIV International Conference
PROBLEMS OF DECISION
MAKING UNDER
UNCERTAINTIES
(PDMU-2014)



ABSTRACTS

*September 1-5, 2014
Cesky Rudolec, Czech Republic*

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**ASYMPTOTIC GENERATOR OF OPTIMIZATION
PROCEDURE WITH IMPULSIVE PERTURBATIONS**

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Continuous stochastic optimization procedure with semi-Markov's switchings and impulsive perturbations is defined by the evolution equation[1]:

$$du^\varepsilon(t) = a(t)[\nabla_{b(t)}C(u^\varepsilon(t); x(t/\varepsilon^4))]dt + \varepsilon d\eta^\varepsilon(t), \quad (1)$$

where $\nabla_{b(t)}C(u; x) = \frac{(C(u+b(t); x) - C(u-b(t); x))}{2b(t)}$, $u \in R$. The

regression function $C(u; x)$ depends on uniformly ergodic semi-Markov process $x(t) > 0, t \geq 0$, in the dimensional space phase of states (X, X) , $u^\varepsilon(t), t \geq 0$ – random evolution, ε - scheme parameter. Impulsive perturbation process $\eta^\varepsilon(t), t \geq 0$ and its generator are defined in [2].

Lemma. Generator of procedure (1) on perturbed Lyapunov function $V^\varepsilon(u; x, t) = V(u) + \varepsilon^3 a(t)V_1(u; x) + \varepsilon^4 a(t)V_2(u; x)$, where $V(u) \in C^4(R)$, has representation:

$$\mathbf{L}_{t,0}^\varepsilon V^\varepsilon(u, x, t) = a(t)\mathbf{L}V(u) + \varepsilon\theta_0^\varepsilon(t)V(u),$$

where $\mathbf{L}V(u) = \Pi C_b(x)V(u) = \Pi \nabla_b C(u; x)V'(u)$. The negligible term $\theta_0^\varepsilon(t)V(u)$, satisfies condition $|\theta_0^\varepsilon(t)V(u)| \leq M$.

References

- 1 Kukurba V. Stochastic optimization with semi-Markov switching and impulsive perturbation. / Kukurba V // Mathematic and Computing Modeling Kamenetz-Podolsk National University – 2013. — №. 8. – P. 112-121.
2. Semenyuk S. Stochastic evolution systems with impulsive perturbation / Semenyuk S., Chabanyuk Ya. // Physics and Mathematics — Lviv. : National University Lviv Polytechnic – 2009 № 660, — 56–60 p.