



Date of birth 12 January 1973

EDUCATION

PhD	Tomsk State University Faculty of applied mathematics and cybernetics Supervisor: Sergey Vorobejchikov, PhD Thesis: "Change point detection and parameter estimation of autoregressive processes by noised observations"	Sept. 1995 – Sept. 1998
BSc Mathematics	Tomsk State University Faculty of applied mathematics and cybernetics First class grade	Sept. 1990 – June 1998

EMPLOYMENT

Assistant professor	Tomsk Polytechnic University Institute of cybernetics Department of computer engineering Full-time job	Jan. 2002 – present
Programmer	Tomsk State University Faculty of applied mathematics and cybernetics Department of higher mathematics and mathematical modelling	Dec. 1998 – present (Jan. 2002 – present part-time job)

SKILLS

Language Skills

Russian – native
English – fluent (B2.2 level)

IT Skills

Microsoft C++, Microsoft Excel, Microsoft Word, Microsoft Power Point, Fortran, LaTeX – intermediate

REFEREES

Prof Sergey Vorobejchikov
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Prof Victor Konev
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Prof Nikolai Markov
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30, Lenina pr., Tomsk, Russian Federation
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RESEARCH INTERESTS

- Guaranteed sequential parameter estimation and change point detection in time series
- Monte-Carlo simulation of acoustic radiation

- Self-checking digital circuits design

TEACHING

In the past:

- Mathematical models of physics (seminars, Russian)
- Programming (seminars, Russian)
- Differential equations (lectures, Russian)
- Linear algebra and analytic geometry (lectures, Russian)
- Function analysis (seminars, Russian)
- Probability theory and mathematical statistics (lectures, seminars, Russian)
- Mathematical models of the theory of finance (seminars, Russian)
- Social and economic statistics (lectures, seminars, English)

Now:

- Discrete mathematics (lectures, seminars, Russian)
- Graph theory (lectures, seminars, Russian, English)
- Automata theory (lectures, seminars, Russian)

Supervision of students

- Bachelors 2003 – 2014
- Masters 2007, 2014, 2015

Coach of students' team of programmers 2004 – 2007

Textbooks (in Russian)

- **Yu.B.Burkatovskaya**, N.B.Butorina, A.Yu.Matrosova. Sorting and searching data: methods and algorithms. Tomsk: TSU, 2008. – 140 p.
- S.V.Bikova, **Yu.B.Burkatovskaya**. Boolean functions. Tomsk: TSU, 2009. – 192 p.
- L.I.Burkatovskaya, **Yu.B.Burkatovskaya**. Logical design of digital circuits. Tomsk: TSU, 2011.–172p.
- **Yu.B.Burkatovskaya**, E.S.Veremeenko. Synthesis and testing of discrete systems. TPU, 2012. – 94 p.
- **Yu.B.Burkatovskaya**. Graph theory. Part 1. Tomsk: TPU, 2014. – 193 p.

PUBLICATIONS

1. **Burkatovskaya Yu.B.**, Vorobeichikov S.E. Detection of change-points in a noisy autoregression process // Automation and Remote Control. V. 61. № 3 PART 1. Pp. 425-437. (2000).
2. Shamanaeva L.G., **Burkatovskaya Yu.B.** Statistical estimation of the contribution of multiple scattering to the intensity of the acoustic radiation transmitted through lower 500-meter layer of the atmosphere // Russian Physics Journal. V. 50. No. 12. Pp. 71-78. (2004) (in Russian)
3. **Burkatovskaya Yu.B.**, Karagodin M.A., Osokin A.N. Bivariate discrete transformations in shrinking algorithms of video sequence// Bulletin of the Tomsk Polytechnic University. V. 309. No. 2. Pp. 17-22 (2006).
4. **Burkatovskaya Yu.B.**, Malchukov A.N., Osokin A.N. Fast algorithms of polynomials division in arithmetic modulo 2 // Bulletin of the Tomsk Polytechnic University. V. 309. No. 1. Pp. 19-24 (2006).
5. **Burkatovskaya Yu.B.**, Vorobeichikov S.E. Guaranteed detection of an imbalanced instant of the GARCH-process // Automation and Remote Control. V. 67. № 12. Pp. 1913-1926. (2006)
6. **Burkatovskaya Yu.B.**, Malchukov A.N., Osokin A.N. The speed codec of Bose-Chaudhuri Hocquenghem code realized on the basis of the programmed logic integrated circuit // Instruments and Systems: Monitoring, Control, and Diagnostics. No.3. Pp. 21-23 (2006) (in Russian).
7. Shamanaeva L.G., **Burkatovskaya Yu.B.** Variations of the multiple scattering contribution to the transmitted acoustic radiation intensity // Russian Physics Journal. V. 50. No. 10. Pp. 1056-1060. (2007)
8. **Burkatovskaya Yu.B.**, Markov N.G., Morozov A.S., Serykh A.P. Application of Johnson distribution to the problem of aerospace images classification. // Bulletin of the Tomsk Polytechnic University. 2007. V. 311. № 5. Pp. 69-73. (2007)
9. Belov V.V., Shamanaeva L.G., **Burkatovskaya Y.B.**, Krasnenko N.P. Statistical estimates of the influence of the source divergence angle on the characteristics of acoustic radiation transmitted through the atmosphere// Russian Physics Journal. V. 52. № 12. Pp. 1264-1270 (2009).
10. **Burkatovskaya Yu.B.**, Vorobeichikov S.E. A Weighted Least Squares Method for Guaranteed Estimation of Parameters of ARCH(1) Process// Tomsk State University Journal of Control and Computer Science. No. 3(8). - Pp. 27-32 (2009) (In Russian)
11. **Burkatovskaya Yu.B.**, Vorobeichikov S.E. Guaranteed Estimation of Parameters of ARCH(p) Process// Tomsk State University Journal of Control and Computer Science. No. 4(13). - Pp. 40-49 (2010) (In Russian)
12. Belov V.V., Shamanaeva L.G., **Burkatovskaya Y.B.**, Krasnenko N.P. Statistical estimates of the influence of the source divergence angle on the characteristics of acoustic radiation transmitted through the atmosphere. // Russian Physics Journal. V. 52. № 12. Pp. 1264-1270 (2009). - C. 100-106

13. Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P., Shamanaeva L.G. Monte Carlo method in atmospheric acoustics. // Atmospheric and oceanic optics. V. 24. No. 12. P. 1072-1077 (2011) [in Russian].
14. **Burkatovskaya Yu. B.**, Vorobeychikov S. E., Sergeeva E. E. Parameter estimation and their change-point detection for generalized autoregressive process with conditional heteroscedasticity // Tomsk State University Journal of Control and Computer Science. No. 1(18). - Pp. 48 – 57. (2012) (In Russian)
15. **Burkatovskaya Yu. B.**, Vorobeychikov S. E., Sergeeva E. E. Asymptotic properties of parameter estimation and change-point detection procedures for generalized autoregressive process with conditional heteroscedasticity // Tomsk State University Journal of Control and Computer Science. No. 2(19). - Pp. 59 – 71. (2012) (In Russian)
16. Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P., Tarasenkov M.V., Shamanaeva L.G.. Statistical simulation of the process of acoustic radiation propagation through the moving turbulent atmosphere with allowance for refraction// Russian Physics Journal. V/ 54, I. 11, pp 1286-1294 (2012).
17. **Burkatovskaya Yu. B.**, Vorobeychikov S. E. Guaranteed estimation of parameters of threshold autoregressive process with conditional heteroskedasticity.// Tomsk State University Journal of Control and Computer Science. No. 2(23). - Pp. 32 – 41. (2013) (In Russian)
18. V.V. Belov, **Burkatovskaya Yu.B.**, Krasnenko N.P., Shamanaeva L.G. Monte Carlo Calculations of Acoustic Wave Propagation in the Turbulent Atmosphere //Communications in Computer and Information Science. Switzerland: Springer. Vol. 487. Information Technologies and Mathematical Modelling. P. 34-43. (2014).
19. V.V. Belov, **Burkatovskaya Yu.B.**, Krasnenko N.P., Shamanaeva L.G. Monte Carlo Calculations of Acoustic Wave Propagation in the Turbulent Atmosphere //Communications in Computer and Information Science. Switzerland: Springer. Vol. 487. Information Technologies and Mathematical Modelling. P. 34-43. (2014)
20. Belov V.V., **Burkatovskaya Y.B.**, Kozhevnikova A.V., Tarasenkov M.V., Shamanaeva L.G. Statistical imitation modeling for atmospheric-optical and acoustic applications // Computational technologies. V. 19. No. 3. P. 57-75 (2014).
21. **Burkatovskaya Y. B.** , Kabanova T. V. , Vorobeychikov S. E. CUSUM Algorithms for Parameter Estimation in Queueing Systems with Jump Intensity of the Arrival Process // Communications in Computer and Information Science. V. 564. P. 275-288 (2015).
22. Shamanaeva L.G., Belov V.V., **Burkatovskaya Yu. B.**, Krasnenko N.P. Influence of the outer scales of temperature and dynamic turbulence on the characteristics of transmitted acoustic radiation //Proceedings of SPIE - The International Society for Optical Engineering. Vol. 9680. (2015)

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1. **Burkatovskaya Yu.B.**, Malchukov A.N., Osokin A.N. Algorithms of accelerated division on modulo 2 // 7th Korea-Russia International Symposium. - Korea: KORUS, 2003. - Pp. 189-192
2. Shamanaeva L.G., **Burkatovskaya Y.B.**, Study of multiple scattering effects on the acoustic wave propagation through a turbulent atmosphere // 12th international symposium on acoustic remote sensing and associated techniques of the atmosphere and oceans. - Cambridge, UK: Cambridge, 2004. - Pp. 87-90
3. Vorobeychikov S. E., **Burkatovskaya Yu. B.** Change point detection of GARCH - process // Probability theory, stochastic processes, mathematical statistics and applications. . - Minsk: BSU, 2005. - pp. 74-81
4. **Burkatovskaya Yu.B.**, Karagodin M.A., Osokin A.N. Fast 2D Walsh Transform for the Truecolor Image Compression Algorithm // Proceedings KORUS-2005. – Novosibirsk, 2005. - Pp. 634-636
5. Shamanaeva L.G., **Burkatovskaya Y.B.** Statistical estimates of the contribution of multiple scattering in the intensity of the transmitted acoustic radiation // XII International Symposium «Atmospherics and Oceanic Optics. Atmospheric Physics.» - Томск: ИОА СО РАН, 2005. - С. 24-24
6. Shamanaeva L.G., **Burkatovskaya Y.B.** Statistical estimates of seasonal variations of the multiple scattering contribution to the transmitted acoustic radiation intensity // XIII International Symposium «Atmospherics and Oceanic Optics. Atmospheric Physics.» - Tomsk, 2006. - С. 148-148.
7. **Burkatovskaya Yu.B.**, Butorina N.B., Matrosova A.Yu. Self-testing checker design for arbitrary number of code words of (m,n)-code // Proceeding of the 10th Biennale International Baltic Electronics Conference. Oct. 2006, Tallinn. Pp. 183-186.
8. **Burkatovskaya Yu.B.**, Butorina N.B., Matrosova A.Yu. Design Methods of Self-Testing Checker for Arbitrary Number of Code Words of (m,n)-code // Proceedings of IEEE EWDTW-2006. Pp. Sep.2006, Sochi. Pp. 355-360
9. Shamanaeva L.G., **Burkatovskaya Y.B.** Statistical estimates of multiple scattering contributions to the transmitted acoustic radiation intensity // Proceedings of International Symposium for the Advancements of boundary Layer Remote Sensing. - Forschungszentrum Karlsruhe GmbH, 2006. - Pp. 14-16
10. **Burkatovskaya Yu.B.**, Serikh A.P., Drobinskii A.V. Application of Johnson distributions in Image Processing Problems // XIV Russian National School on statistical methods. – Sept. 29 – Oct. 7, Sochi, 2007. - Pp. 1094 - 1095.
11. Shamanaeva L.G., **Burkatovskaya Y.B.** Regional and Seasonal Variations of Multiple Scattered Component of Acoustic Radiation Propagating through the Atmospheric Boundary Layer // XIV International Symposium «Atmospherics and Oceanic Optics. Atmospheric Physics.» - Tomsk., 2007. - Pp. 111-111
12. Shamanaeva L.G., Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P. Statistical estimates of influence of the angular source divergence on the characteristics of acoustic radiation transmitted through the atmosphere // International Symposium for the Advancement of Boundary Layer Remote Sensing ISARS 2010. - Paris, France: ISARS 2010.

13. **Burkatovskaya Yu. B.**, Vorobeychikov S. E. Weighted Least Squares Method of Guaranteed Estimation of ARCH(p) Process Parameters // The Third International Conference "Problems of Cybernetics and Informatics", September 6-8 2010, Baku, Azerbaijan", 2010. - Pp. 251-254
14. **Burkatovskaya Yu. B.**, Vorobeychikov S. E. A Sequential Procedure for Parameter-Change Detection in the AR/ARCH Process // 11th International Conference "Pattern Recognition and Image Processing". - Belarus, Minsk: BSUIR, 2011. - C. 159-164
15. Vorobeychikov S. E., **Burkatovskaya Yu. B.** Change point detection of autoregressive process with unknown parameters // 18th IFAC World Congress. - Milano (Italy): IFAC, 2011. - C. 13215-13220
16. Shamanaeva L.G., Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P. Monte Carlo method in atmospheric acoustics // XVII International Symposium «Atmospherics and Oceanic Optics. Atmospheric Physics.» Tomsk, 2011. - Pp. 15-19
17. Shamanaeva L.G., Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P. Statistical simulation of acoustic radiation propagation in the lower atmosphere by the Monte Carlo method // Proceedings of SPIE. 2012. V. 8696. 8696-42. Pp. 1-7
18. Shamanaeva L.G., Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P., Tarasenkov M.V. Statistical simulation of acoustic radiation propagation through the moving turbulent atmosphere with allowance for refraction (oral) // 16th International Symposium for the Advancement of Boundary-Layer Remote Sensing, http://www.esrl.noaa.gov/psd/events/2012/isars/abstract_export_pdf.php?abstract_id=1047&session_id=S12-4. 5-8 June 2012. Boulder. Colorado. USA.
19. **Burkatovskaya J.**, Butorina N. The Properties of the Essential Subtrees of a Graph Representation of the (m, n) – codewords//7th International Forum on Strategic Technology (IFOST - 2012): Proceedings: in 2 vol., Tomsk, September 18-21, 2012. - Tomsk: TPU Press, 2012 - Vol. 1 - p. 472-476.
20. Shamanaeva L.G, Belov V.V., **Burkatovskaya Yu.B.**, Krasnenko N.P., Rakov D.S. Statistical estimation of acoustic radiation propagation in the surface layer // XVII International Symposium «Atmospherics and Oceanic Optics. Atmospheric Physics.» Tomsk, 2013. - Pp. B59-B62.
21. Burkatovskaya Yu.B., Vorobeychikov S.E., Sergeeva E.E. On Guaranteed Sequential Change Point Detection for AR(1)/ARCH(1)/ Process //Proceedings of the XIII International Scientific Research and Practice Conference named after A. F. Terpigov «Information technologies and mathematical modelling» (ITMM – 2014). Tomsk, November 20-22, 2014. – Tomsk, TSU Press.- Vol. 1. Pp 3-8.
22. Belov V.V., Burkatovskaya Yu.B., Krasnenko N.P., Shamanaeva L.G. Monte Carlo Calculations of Acoustic Wave Propagation in the Turbulent Atmosphere//Proceedings of the XIII International Scientific Research and Practice Conference named after A. F. Terpigov «Information technologies and mathematical modelling» (ITMM – 2014). Tomsk, November 20-22, 2014. – Tomsk, TSU Press.- Vol. 2. Pp 3-8.
23. **Burkatovskaya Y. B.** , Kabanova T. V. , Vorobeychikov S. E. CUSUM Algorithms for Parameter Estimation in Queueing Systems with Jump Intensity of the Arrival Process // Proceedings of the XIV International Scientific Research and Practice Conference named after A. F. Terpigov «Information technologies and mathematical modelling» (ITMM – 2015). Tomsk, November 21-23, 2015. – Tomsk, TSU Press.- Vol. 1. Pp 3-8.

FUNDING and ACADEMIC AWARDS

- Grant No. 98-01-00297-a of Russian Fond of Fundamental Research "Guaranteed estimation of the regression function with dependent noises with the unknown spectrum", 1998 – 1999 (participant, leader – prof. V.V.Konev).
- Grant No. 00-01-00880-a of Russian Fond of Fundamental Research “Guaranteed conclusions in stochastic systems with nuisance parameters”, 2000 – 2002 (participant, leader – prof. V.V.Konev).
- Grant No.06-07-89190-a of Russian Fond of Fundamental Research "Creating a geographic information system for the analysis of the dynamics of the Earth's surface according to aerospace monitoring", 2006 – 2008 (participant, leader – prof. N.G.Markov).
- Grant No. 11-01-08042-3 of Russian Fond of Fundamental Research "Participation in XVIII International IFAC Congress", 2001 (leader).
- Grant No. 16-01-00121-a of Russian Fond of Fundamental Research “New statistical methods for signal and image processing with unknown spectral characteristics in complex dynamic systems” (participant, leader – prof. S.M.Pergamenshchikov).