



## VU Institute of Mathematics and Informatics Annual Report 2011



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**Director** – Prof. Habil. Dr. *Gintautas Dzemyda*

### **STAFF**

74 research fellows (20 habilitated doctors and 44 doctors),  
62 doctoral students.

### *Main research trends of the Institute*

### *Doctoral Dissertations maintained in 2010*

### *Conferences and Seminars organised in 2010*

### *INFORMATICS METHODOLOGY DEPARTMENT*

### *NUMERICAL ANALYSIS DEPARTMENT*

### *PROBABILITY THEORY AND STATISTICS DEPARTMENT*

### *RECOGNITION PROCESSES DEPARTMENT*

### *SOFTWARE ENGINEERING DEPARTMENT*

### *MATHEMATICAL LOGIC SECTOR at the SED*

### *STOCHASTIC PROCESSES DEPARTMENT*

### *SYSTEMS ANALYSIS DEPARTMENT*

### *OPERATIONAL RESEARCH SECTOR at the SAD*

### **MAIN RESEARCH TRENDS OF THE INSTITUTE**

- Probability Theory and Mathematical Statistics; Finance and Actuarial Mathematics; Differential Equations and Numerical Methods for their Solution; Mathematical Logic and Algorithm Theory;
- Recognition Processes, Data Analysis, Multi-Modal Optimization Problems, Multimedia Technologies and Interactive Systems;
- Theoretical and Methodical Fundamentals of Informatics, Information and Communication Technology (ICT) in Education, Computer Networks and Software Engineering Methods and Applications in the Creation of New Information Technologies.

## ***DOCTORAL DISSERTATIONS MAINTAINED IN 2011***

- Monika Vilkienė “Investigations of the Accuracy of Approximations of Semigroups”
- Alma Molytė “Investigation of Combinations of Vector Quantization Methods with Multidimensional Scaling”;
- Svetlana Roman “Green’s Functions for Boundary-Value Problems with Nonlocal Boundary Conditions”;
- Julius Andrikonis “Effective Method to Obtain Terminating Proof-Search in Transitive Multimodal Logics”.

## ***CONFERENCES AND SEMINARS ORGANIZED IN 2011***

- 4th National Young Scientists Conference of the Lithuanian OR Society “Operational research for business, engineering and information technologies”, September 30, 2011, Kaunas, Lithuania;
- 3rd International Seminar on “Data analysis methods for software systems”, December 1–3, 2011, Druskininkai, Lithuania;
- International Doctoral Consortium „Informatics and Informatics Engineering Education Research: Methodologies, Strategies and Implementation“, November 30–December 4, 2011, Druskininkai, Lithuania
- Differential Equations and Numerical Analysis seminar, periodicity: on the average twice a month, on Wednesdays, at 11 a.m.

## **INFORMATICS METHODOLOGY DEPARTMENT**

Akademijos 4, LT-08663 Vilnius

Tel. +370 2109732

E-mail: valentina.dagiene at mii.vu.lt

**Head** – Prof. Dr. Valentina Dagiienė

### **Principal researchers:**

1. Prof. Habil. Dr. Valentina Dagiienė

### **Researchers:**

1. Dr. Vaiva Grabauskienė,
2. Dr. Tatjana Jevsikova,
3. Dr. Jevgenij Kurilov;
4. Dr. Jūratė Skūpienė

### **Assistant researchers:**

1. Viktoras Dagys

### **Technical assistants:**

1. Remigijus Andžius,
2. Gabrielė Daukšaitė,
3. Antanas Grincevičius,
4. Ieva Jonaitytė,
5. Giedrė Svetikienė,
6. Rimantas Žakauskas.

### **Doctoral students:**

1. Eglė Jasutė,
2. Anita Juškevičienė,
3. Svetlana Kubilinskienė,
4. Silvija Šerikovienė,

5. Bronius Skūpas,
6. Jūratė Urbonienė,
7. Lina Zajančauskienė,
8. Inga Žilinskienė.

### ***RESEARCH INTERESTS***

Technology enhanced learning, teaching programming and informatics, localization of digital resources, models of quality evaluation of educational system components.

### ***RESEARCH PROJECTS CARRIED OUT IN 2011***

#### **Projects Supported by University Budget**

Themes: 1. Engineering Research for Technology Enhanced Learning;  
2. Research on software localization.

Main results: 1) methods for engineering education research, 2) development of methods and specifications for evaluation of the quality of education system components, 3) derivation of fundamentals and advanced informatics concepts and proof their appropriateness to use in contests.

#### **Projects, Programmes, Issues Supported by Lithuanian State Science and Studies Foundation**

International conference „Informatics Fundamentals and Computer Fluency“, Druskininkai, 2011-05-10-15 (participants from 23 countries).

International doctoral consortium Informatics and Informatics Engineering Education Research: Methodologies, Strategies and Implementation, 2011-11-29 – 12-04.

Head of Department Valentina Dagiienė has organized IFIP conference in Mombasa and several workshops for teachers in Nairobi.

#### **Governmental Science Programmes and Research Projects Ordered by the Branch Ministries**

Science for business and society (Mokslas verslui ir visuomenei). Agreement Nr. S-VP2-1.4-ŪM-03-K-01-019. 2009-11-02–2011-10-31. Prof. V. Dagiienė

#### **Ordered Research Projects**

Development of data of the Term Bank of the Republic of Lithuania.

Agreement Nr. VP-1/2011/APS-580000-182. 2011-01-13–2011-12-31. S. Meškauskienė

#### **International Science Programmes and Projects**

te@ch.us - Learning community for Web 2.0 teaching. Ref. Nr. 504333-LLP-1-2009-1-DE-COMENIUS-CMP. 2009–2011. Prof. V. Dagiienė

Nordic Network for Engineering Education Research (NNEER). 2009–2012. Prof. V. Dagiienė

### ***PUBLICATIONS***

#### **Monograph**

##### **09P - Informatics**

1 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Dagiienė, Valentina. Evaluation of quality of learning software : basics, . concepts, methods : monograph. Saarbrücken : LAP Lambert Academic Publishing, 2011. 104 p. ISBN 9783838396934.

#### **Teaching and/or methodical material(s)**

## **09P - Informatics**

- 1 Dagienė, Valentina (sudaryt.); Jonaitytė, Ieva (sudaryt.). Bebras, 2010 : tarptautinio informatikos ir . informacinių technologijų konkurso užduotys su sprendimais / sudarytojos: Valentina Dagienė, Ieva Jonaitytė. Vilnius : TEV, 2011. 92 p. : iliustr. ISBN 9786094330490.

### **Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

#### **09P - Informatics**

- 1 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Žilinskienė, Inga; Ignatova, Natalija. Evaluation of quality of learning . scenarios and their suitability to particular learners' profiles // ECEL 2011 : proceedings of the 10th European Conference on E-Learning, Brighton, 10-11 November 2011 [CD-ROM]. ISBN 9781908272232. Brighton : University of Brighton, 2011, p. 380-389.
- 2 Dagienė, Valentina. Informatics education for new millennium learners // Informatics in schools : contributing . to 21st century education : 5th international conference ISSEP 2011, Bratislava, Slovakia, October 26-29 : proceedings / Ivan Kalaš, Roland T. Mittermeir (eds). Book series: Lecture Notes in Computer Science. Vol. 7013 Berlin : Springer, 2011. ISBN 9783642247217. p. 9-20.
- 3 Bell, Tim; Curzon, Paul.; Cutts, Quintin; Dagienė, Valentina; Haberman, Bruria. Overcoming obstacles to CS . education by using non-programming outreach programmes // Informatics in schools : contributing to 21st century education : 5th international conference ISSEP 2011, Bratislava, Slovakia, October 26-29 : proceedings / Ivan Kalaš, Roland T. Mittermeir (eds). Book series: Lecture Notes in Computer Science. Vol. 7013 Berlin : Springer, 2011. ISBN 9783642247217. p. 71-81.

### **Paper(s) in the reviewed international conference proceedings**

#### **01P - Mathematics**

- 1 Dagienė, Valentina. What kinds of tasks are good for contests? // Creativity in mathematics education and the . education of gifted students : 6th international conference, Riga, Latvia, 2011 : proceedings. Riga : University of Latvia, 2011. ISBN 9789984453606. p. 62-65.
- 2 Dagienė, Valentina; Kašuba, Romualdas. "Kangaroo" and "Beaver" - the contests for all pupils to be more . interested in mathematics and informatics // Creativity in mathematics education and the education of gifted students : 6th international conference, Riga, Latvia, 2011 : proceedings. Riga : University of Latvia, 2011. ISBN 9789984453606. p. 56-61.
- 3 Haberman, Bruria; Averbuch, Haim; Cohen, Avi; Dagienė, Valentina. Work in progress - initiating the beaver . contest on computer science and computer fluency in Israel // Frontiers in education : 41st ASEE/IEEE conference, 2011, October 12-185 Rapid city, USA. Rapid city, 2011. ISBN 9781612844695. p. [1-2]. Prieiga per internetą: <<http://fie-conference.org/fie2011/papers/1494.pdf>>.

### **Paper(s) in the reviewed international conference proceedings**

#### **07T - Informatics engineering**

- 1 Dagienė, Valentina; Skūpas, Bronius. Semi-automatic testing of program codes in the high school student . maturity exam // Computer systems and technologies : 12th international conference CompSysTech' 11 : proceedings, Austria, June 2011. Vienna : ACM press, 2011. p. 564-569.

### **Paper(s) in the reviewed international conference proceedings**

#### **09P - Informatics**

- 1 Dagienė, Valentina; Skūpas, Bronius. Semi-automatic testing of program codes in the high school student . maturity exam // Computer systems and technologies : 12th international conference CompSysTech' 11 : proceedings, Austria, June 2011. Vienna : ACM press, 2011. p. 564-569.
- 2 Haberman, Bruria; Cohen, Avi; Dagienė, Valentina. The beaver contest - attracting youngsters to study . computing // Innovation and technology in computer science ITiCSE' 11 : proceedings of the 16th annual conference, June 27-29, 2011, Germany Darmstadt, 2011. ISBN 9781450306973. p. 378.
- 3 Weigend, Michael; Grabauskienė, Vaiva. Metaphorical geometry // ISSEP 2011: Informatics in schools : . situation, evolution and perspectives : 5th international conference : proceedings of selected papers, Bratislava, Slovakia, October 26-29 / Daniela Bezá Ivan Kalaš (eds) [elektroninis išteklius (CD-ROM)]. Bratislava : Comenius university, 2011. ISBN 978089186907. [12 p.].

### **Paper(s) in the reviewed Lithuanian conference proceedings**

#### **09P - Informatics**

- 1 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Vinogradova, Irina; Žilinskienė, Inga. Analitinio hierarchinio proceso . (AHP) metodo taikymas nuotolinių mokymo kursų naudotojų sąsajos kokybei vertinti // XV kompiuterininkų konferencijos mokslo darbai. Vilnius : Žara, 2011. ISBN 9789986342618. p. 87-98.

### **Paper(s) in non-reviewed international conference proceedings**

#### **07T - Informatics engineering**

- 1 Dagienė, Valentina; Jevsikova, Tatjana. Informatics concepts in secondary school education : what should we

. teach? // ICT and informatics in a globalized world of education : facing the future: reflecting on the past : book of abstracts, 16-19 August, 2011. Mombasa, 2011. p.

#### **Paper(s) in non-reviewed international conference proceedings**

##### **09P - Informatics**

1 Dagienė, Valentina; Jevsikova, Tatjana. Informatics concepts in secondary school education : what should we . teach? // ICT and informatics in a globalized world of education : facing the future: reflecting on the past : book of abstracts, 16-19 August, 2011. Mombasa, 2011. p.

**Spaudinio rūšis: P2c** - Straipsnis nerecenzuojamoje Lietuvos konferencijos medžiagoje

##### **09P - Informatics**

1 Dagienė, Valentina; Jonaitytė, Ieva. Septintasis informacinių technologijų konkursas "Bebras" // . Kompiuterininkų dienos - 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 66-77.

2 Dagys, Viktoras; Daniūnas, Valentinas. Projektas "Mokslas verslui ir visuomenei": informacinių technologijų . įrankiai portale "mokslasplius.lt" // Kompiuterininkų dienos - 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 78-84.

3 Grigas, Gintautas. Lietuvybės kompiuteryje raida XXI a. pirmajame dešimtmetyje // Kompiuterininkų dienos - . 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 85-103.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **07T - Informatics engineering**

1 Dagienė, Valentina; Grigas, Gintautas; Jevsikova, Tatjana. Comparison of two 12-key assignments on mobile . devices // Elektronika ir elektrotechnika / Kauno technologijos universitetas. Kaunas : Technologija. ISSN 1392-1215. 2011, nr. 2, p. 97-102. Prieiga per internetą: <[http://www.ktu.lt/lt/mokslas/zurnalai/elektros\\_z/z108/22\\_\\_ISSN\\_1392-1215\\_Comparison%20of%20Two%2012-Key%20Assignments%20on%20Mobile%20Devices.pdf](http://www.ktu.lt/lt/mokslas/zurnalai/elektros_z/z108/22__ISSN_1392-1215_Comparison%20of%20Two%2012-Key%20Assignments%20on%20Mobile%20Devices.pdf)>.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **09P - Informatics**

1 Dagienė, Valentina; Grigas, Gintautas; Jevsikova, Tatjana. Comparison of two 12-key assignments on mobile . devices // Elektronika ir elektrotechnika / Kauno technologijos universitetas. Kaunas : Technologija. ISSN 1392-1215. 2011, nr. 2, p. 97-102. Prieiga per internetą: <[http://www.ktu.lt/lt/mokslas/zurnalai/elektros\\_z/z108/22\\_\\_ISSN\\_1392-1215\\_Comparison%20of%20Two%2012-Key%20Assignments%20on%20Mobile%20Devices.pdf](http://www.ktu.lt/lt/mokslas/zurnalai/elektros_z/z108/22__ISSN_1392-1215_Comparison%20of%20Two%2012-Key%20Assignments%20on%20Mobile%20Devices.pdf)>.

#### **Article(s) in DB approved by Research Council of Lithuania**

##### **09P - Informatics**

1 Jasutė, Eglė; Dagienė, Valentina. Interaktyviojo geometrijos vizualizavimo modelis naudojant dinaminės . geometrijos paradigmą // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 31-41. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/31-41.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/31-41.pdf)>.

2 Skūpas, Bronius. Pasikeitimų informacinių technologijų valstybiniame brandos egzamine analizė // . Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 57, p. 115-123. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-57/115-123.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-57/115-123.pdf)>.

#### **Paper(s) in other databases**

##### **09P - Informatics**

1 Dagienė, Valentina; Grabauskienė, Vaiva. Transformation of individual learning through informatics and . information technology activities in primary school // International journal of digital literacy and digital competence. Hershey : IGI Global. ISSN 1947-3494. 2011, vol. 2, no 3, p. 1-14.

2 Kurilov, Jevgenij [Kurilovas, Eugenijus]. Interoperability guidelines for Lithuanian e-learning management . systems // Socialinės technologijos. Vilnius: Mykolo Romerio universitetas. ISSN 2029-7564. 2011, Nr 1, p. 179-192. Prieiga per internetą: <[http://www.mruni.eu/lt/mokslo\\_darbai/st/archyvas/?l=111144](http://www.mruni.eu/lt/mokslo_darbai/st/archyvas/?l=111144)>.

3 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Birenienė, Virginija; Serikovienė, Silvija. Methodology for evaluating . quality and reusability of learning objects // Electronic journal of e-learning. Kidmore End: Academic Conferences Ltd. ISSN 1479-4403. 2011, vol. 9, no 1, p. 39-51. Prieiga per internetą: <<http://www.ejel.org/volume9/issue1>>.

#### **Reviewed article(s)**

##### **01P - Mathematics**

1 Juškevičienė, Anita. Antros kartos saityno technologijos ir mokymas(is) // Lietuvos matematikos rinkinys. LMD . darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 89-94. Prieiga per internetą:

<ftp://ftp.science.mii.lt/pub/publications/52\_TOMAS(2011)/MAT\_INFORMATIKOS\_DESTYMAS/met\_Juskeviciene.pdf>.

2 Kavaliauskas, Algis; Žilinskienė, Inga. Kai kurie kombinatorikos ir statistikos mokymo ypatumai // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 100-104. Prieiga per internetą:  
<ftp://ftp.science.mii.lt/Pub/Publications/52\_TOMAS(2011)/MAT\_INFORMATIKOS\_DESTYMAS/met\_Kavaliauskas\_Zilin.pdf>.

3 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Žilinskienė, Inga. Kokybės vertinimo metodų taikymas mokomiesiems scenarijams vertinti // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 110-115. Prieiga per internetą:  
<ftp://ftp.science.mii.lt/Pub/Publications/52\_TOMAS(2011)/MAT\_INFORMATIKOS\_DESTYMAS/met\_Kurilovas\_Zilin.pdf>.

4 Zajančkauskienė, Lina. Programų kurtiesiems ir neprigirdintiesiems lokalizavimo ir internacionalizavimo metodika // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 343-348. Prieiga per internetą:  
<ftp://ftp.science.mii.lt/Pub/Publications/52\_TOMAS(2011)/TEORINE\_INFORMATIKA/tin\_Zajanciauskiene.pdf>.

#### **Reviewed article(s)**

##### **09P - Informatics**

1 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Vinogradova, Irina; Šėrikovienė, Silvija. Application of multiple criteria decision analysis and optimisation methods in evaluation of quality of learning objects // International journal of online pedagogy and course design. Hershey : IGI Publishing. ISSN 2155-6873. 2011, vol. 1, no 4, p. 62-76.

2 Urbonienė, Jūratė; Juškevičienė, Anita. WEB 2.0 technologijų adaptuojamumo programavimo mokymui galimybių tyrimas // Studijos šiuolaikinėje visuomenėje = Studies in modern society / Šiaurės Lietuvos kolegija. Šiauliai : Šiaulių knygriškla. ISSN 2029-431X. 2011, nr. 2, p. 161-170.

##### **Other paper(s)**

##### **07T - Informatics engineering, 09P - Informatics**

1 Otas, Alfredas; Dagys, Viktoras; Maskeliūnas, Saulius; Žandaris, Aidas. Lietuvos kompiuterininkų sąjungos veikla 2009-2011 metais // Kompiuterininkų dienos - 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 7-19.

##### **Theses in other reviewed publications**

##### **09P - Informatics**

1 Weigend, Michael; Grabauskienė, Vaiva. Metaphorical geometry // ISSEP 2011: Informatics in schools : situation, evolution and perspectives : 5th international conference : proceedings of selected papers, Bratislava, Slovakia, October 26-29 / Daniela Bezá Ivan Kalaš (eds). Bratislava : Comenius university, 2011. ISBN 978089186907. p. 41.

##### **Part(s) of book(s)**

##### **07T - Informatics engineering**

1 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Dagienė, Valentina. Technological evaluation and optimization of e-learning systems components // E-infrastructures and technologies for lifelong learning: next generation environments / edited by George Magoulas. Hershey : IGI Global, 2011. ISBN 9781615209835.

## **COOPERATION**

Aalto university (Finland): V. Dagienė continues Special course in computing education research for doctoral students (T-106.6500)

- Adger University, Norway.
- Bilbao University, Spain.
- Ecole Normale Supérieure de Cachan (ENS), France.
- ETH, Zurich, Switzerland.
- Groningen University, the Netherlands.
- Uppsala University, Sweden.
- University of Eastern Finland of Joensuu and Kuopio
- Vienna Technical University, Austria
- Weizman Institute of Science, Israel.

- Muenster University (Germany): Survey of V.Grabauskienė and M.Weigend „Metaphorical Geometry“.
- Ugdymo plėtotės centras

## ***OTHER SCIENTIFIC ACTIVITIES***

### **V. Dagienė** (<http://ims.mii.lt/valentina/en/index.htm>)

- Editor-in-Chief of two international journals “Informatics in Education“ (since 2002) and “Olympiads in Informatics” (since 2007).
- Expert of EU Eurostars Programme
- Representative of Lithuania in Education Committee TC3 under the International Federation for Information Processing (IFIP)
- Vice chair of the Technical Committee of IFIP for Education (TC3)
- Member of Steering Committee of International Olympiads in Informatics
- Co-chair of IFIP conference „ICT and Informatics in a Globalized World Education“; Mombassa, Aga Khan Academy, Kenya, 2011-08-16-19.
- Chair of the 5th International conference joint with Olympiad in Informatics, Pattaya, Thailand, 2011-07-22-29.

### **V. Dagys**

- Vice chairman of Council of Lithuanian Computer Society (<http://www.likst.lt/en/>)
- Chair of Program Committee of 10th National Conference on Informatics in School Education (a part of multi-event “Computer Days – 2011”)

### **V. Grabauskienė**

- Long term Internship, supervisor prof. V. Dagienė. Agreement: Nr. 58/MTDS-580000-2033; (2011-01-03 to 2012-12-31)
- Intership in Muenster, Germany (2011-03-22 to 2011-04-25) and Bratislava, Slovakia (2011-10-25 to 2011-11-22).

### **T. Jevsikova**

- International Federation for Information processing (IFIP) TC3 WG3.1 (Informatics and ICT in Secondary Education) (<http://ifiptc.org/?tc=tc3>) – Junior member
- The Institute of Localisation Professionals – Associate member
- International conference ISSEP 2011 (Informatics in Schools: Situation, Evolution and Perspectives), <http://www.issep2011.org> – reviewer
- International conference IIGWE 2011 (ICT and Informatics in a Globalized World of Education), <http://www.iigwe2011.org> – reviewer

### **J. Kurilov**

- Member of Steering Committee of European Schoolnet (or EUN, the network of 31 European Ministries of Education)
- Member of Lithuanian national CEDEFOP and ReferNet Committees
- Expert-evaluator: PHARE, Leonardo da Vinci, eContentplus programmes, European Regional Development Fund
- Expert on preparation of feasibility studies and project documentation: European Commission, Ministry of Education and Science of Lithuania, Central Project Management Agency under the Ministry of Finance of Lithuania
- Expert of CEN LTSO (Learning Technology Standards Observatory) <http://www.cen-ltso.net/>
- Expert of IMS Personalizing Learning Workgroup

## **MEMBERSHIP IN SCIENTIFIC COMMITTEES**

- Scientific journal “Journal of Engineering and Computer Innovations” (JECI)  
<http://www.academicjournals.org/JECI/index.htm> : Associate Editor, reviewer
- Scientific journal “International Journal of Online Pedagogy and Course Design” (IJOPCD)  
[www.igi-global.com/IJOPCD](http://www.igi-global.com/IJOPCD) : reviewer
- Scientific journal „Educational Research and Reviews“ (ERR)  
<http://www.academicjournals.org/err2/> : reviewer
- Scientific journal „International Journal of Library and Information Science (IJLIS)  
<http://www.academicjournals.org/IJLIS/> : reviewer
- IGI Publishing (the books “E-Infrastructures and Technologies for Lifelong Learning: Next Generation Environments”; “Innovations in XML Applications and Metadata Management: Advancing Technologies”): reviewer
- IGI Global (the book “Innovations in XML Applications and Metadata Management: Advancing Technologies”) : member of Editorial Advisory Board, reviewer
- Biannual scientific journal “Informatics in Education”, ISSN 1648-5831 [abstracted / referenced in INSPEC, SCOPUS, etc.] [http://www.mii.lt/informatics\\_in\\_education/](http://www.mii.lt/informatics_in_education/) : member of Editorial Board
- The annual European Conference on e-Learning (ECEL) [abstracted / referenced in Thomson ISI Web of Science, ISTP, ERIC] <http://www.academic-conferences.org/ecel/ecel-home.htm> : member of Programme Committee, reviewer
- The annual International Conference on Creative Content Technologies (CONTENT) [abstracted / referenced in Thomson ISI Web of Science, IEEE, INSPEC, ISTP], <http://www.iaria.org/conferences2010/CONTENT10.html> : member of Programme Committee, reviewer
- The annual International Conference on Networking and Services (ICNS) [abstracted / referenced in Thomson ISI Web of Science, IEEE, INSPEC, ISTP] <http://www.iaria.org/conferences2010/ICNS10.html> International Workshop on Learning Methodologies and Platforms used in the Cisco Networking Academy (LMPCNA) <http://www.iaria.org/conferences2010/LMPCNA.html> : member of Programme Committee, reviewer
- The annual International Conference on Software Engineering Advances (ICSEA) [abstracted / referenced in Thomson ISI Web of Science, IEEE, INSPEC, ISTP] <http://www.iaria.org/conferences2010/ICSEA10.html> : member of Programme Committee, reviewer
- The annual International SE@M (Search & Exchange of e-Le@rning materials) Workshop within the annual International Scientific Conference EC–TEL (European Conference on Technology Enhanced Learning). ISSN 1613-0073 [abstracted / referenced in CEUR WS Proceedings] <http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-385/seam00.pdf> : member of Programme Committee, reviewer
- The annual International Conference on Sustainable Development “Knowledge-Based Technologies and OR methodologies for Strategic Decisions of Sustainable Development” (KORSDD) <http://www.mii.lt/korsdd%2D2009/> : reviewer, organiser and Chair of the stream “Optimization Problems in School Scheduling and Education Process”

## **NUMERICAL ANALYSIS DEPARTMENT**

Akademijos str. 4, LT-08663, Vilnius, Lithuania  
Tel : (+370~5) 2729 400, 2109 734,  
E-mail: arturas.stikonas at mii.vu.lt

**Head:** Prof. Dr. (HP) Artūras Štikonas



## **STAFF**

**Principal researcher:** Prof. Dr. (HP) Artūras Štikonas, Prof. Dr. (HP) Vytautas Kleiza, Prof. Dr. Habil. Mifodijus Sapagovas, Prof. Dr. (HP) Stasys Rutkauskas.

**Senior researcher :** Doc. Dr. Olga Štikonienė.

**Junior researcher:** Kristina Jakubėlienė, Svetlana Roman.

**Affairs manager:** Agnė Skučaitė.

**Doctoral students:** Justina Jachimavičienė, Kristina Jakubėlienė, Mažvydas Mackevičius, Igor Saburov, Kristina Skučaitė–Bingelė, Agnė Skučaitė, Liana Stonkienė, Aidas Balčiūnas, Santa Račkauskienė.

## **RESEARCH INTERESTS**

Differential equations and applications. Investigation of the spectrum and boundary value problems for differential and difference operators with nonlocal conditions.

## **RESEARCH PROJECTS CARRIED OUT IN 2011**

### **Projects Supported by University Budget**

### **Projects Supported by Research Council of Lithuania**

Project: Multidimensional problems with nonlocal boundary conditions: numerical methods and applications. Prof. M. Sapagovas, Doc. Dr. O. Štikonienė, S. Roman. 2011-2012.

### **Governmental Science Programmes and Research Projects Ordered by the Branch Ministries**

### **Ordered Research Projects**

### **International Science Programmes and Projects**

## **PUBLICATIONS**

Article(s) [indexed in Thomson Reuters Web of Science]

### **01P - Mathematics**

- 1 Štikonas, Artūras. Investigation of Characteristic Curve for Sturm–Liouville Problem with Nonlocal Boundary Conditions on Torus // Mathematical modelling and analysis = Matematinis modeliavimas ir analizė / Vilnius Gediminas Technical University, Institute of Mathematics and Informatics Vilnius : Technika. ISSN 1392-6292. 2011, vol. 16, no. 1, p. 1-22. Prieiga per internetą: <[http://pdfserve.informaworld.com/242357\\_932254621\\_936091992.pdf](http://pdfserve.informaworld.com/242357_932254621_936091992.pdf)>.
- 2 Laurinčikas, Antanas. A growth estimate for the Mellin transform of the Riemann zeta function // . Mathematical notes. Austin : Pleiades Publishing. ISSN 0001-4346. 2011, vol. 89, no. 1-2, p. 82-92. Prieiga per internetą: <<http://www.springerlink.com/content/m372kv27k7j16584/fulltext.pdf>>.
- 3 Sapagovas, Mifodijus; Štikonienė, Olga. Alternating-direction method for a mildly nonlinear elliptic equation with nonlocal integral conditions // Nonlinear analysis : modelling and control. Vilnius : Institute of Mathematics and Informatics. ISSN 1392-5113. 2011, vol. 16, no. 2, p. 220-230. Prieiga per internetą: <<http://www.lana.lt/journal/41/NA16208.pdf>>.
- 4 Sapagovas, Mifodijus; Štikonas, Artūras; Štikonienė, Olga. Alternating direction method for the Poisson equation with variable weight coefficients in an integral condition // Differential equations. MAIK Nauka - Interperiodica. ISSN 0012-2661. 2011, vol. 47, no. 8, p. 1176-1187. Prieiga per internetą: <<http://www.springerlink.com/content/22h3lx10721v62k2/fulltext.pdf>>.
- 5 Roman, Svetlana; Štikonas, Artūras. Green's function for discrete second-order problems with nonlocal boundary conditions // Boundary value problems. New York : Hindawi Publishing Corporation. ISSN 1687-2762. vol. 2011, p. art no 767024 [23 p.]. Prieiga per internetą: <<http://www.hindawi.com/journals/bvp/2011/767024/>>.
- 6 Roman, Svetlana. Linear differential equation with additional conditions and formulae for Green's function // . Mathematical modelling and analysis = Matematinis modeliavimas ir analizė / Vilnius Gediminas Technical University, Institute of Mathematics and Informatics Vilnius : Technika. ISSN 1392-6292. 2011, vol. 16, no. 3, p. 401-417. Prieiga per internetą: <<http://www.tandfonline.com/doi/pdf/10.3846/13926292.2011.602125>>.
- 7 Rutkauskas, Stasys. On the solvability conditions of the first boundary value problem for a system of elliptic equations that strongly degenerate at a point // Boundary value problems. New York : Hindawi Publishing

Corporation. ISSN 1687-2762. vol. 2011, Art. no. 16. Prieiga per internetą:  
<<http://www.boundaryvalueproblems.com/content/pdf/1687-2770-2011-16.pdf>>.

8 Apakov, Yusufjon P.; Rutkauskas, Stasys. On a boundary value problem to third order PDE with multiple characteristics // *Nonlinear analysis : modelling and control*. Vilnius : Institute of Mathematics and Informatics. ISSN 1392-5113. 2011, vol. 16, no. 3, p. 255-269. Prieiga per internetą:  
<<http://www.lana.lt/journal/42/NA16301.pdf>>.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **09P - Informatics**

1 Sapagovas, Mifodijus; Štikonienė, Olga. Alternating-direction method for a mildly nonlinear elliptic equation with nonlocal integral conditions // *Nonlinear analysis : modelling and control*. Vilnius : Institute of Mathematics and Informatics. ISSN 1392-5113. 2011, vol. 16, no. 2, p. 220-230. Prieiga per internetą:  
<<http://www.lana.lt/journal/41/NA16208.pdf>>.

##### **Reviewed article(s)**

##### **01P - Mathematics**

1 Roman, Svetlana; Štikonas, Artūras. Green's function for discrete problems with nonlocal boundary conditions // *Lietuvos matematikos rinkinys. LMD darbai*. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 291-296. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/SKAICIAVIMO\\_MATEMATIKA/sm\\_Roman\\_Stik.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/SKAICIAVIMO_MATEMATIKA/sm_Roman_Stik.pdf)>.

2 Skučaitė, Agnė; Štikonas, Artūras. Investigation of the Sturm-Liouville problems with integral boundary condition // *Lietuvos matematikos rinkinys. LMD darbai*. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 297-302. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/SKAICIAVIMO\\_MATEMATIKA/sm\\_SkucA\\_Stik.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/SKAICIAVIMO_MATEMATIKA/sm_SkucA_Stik.pdf)>.

3 Skučaitė-Bingelė, Kristina; Štikonas, Artūras. Investigation of complex eigenvalues for a stationary problem with two-point nonlocal boundary condition // *Lietuvos matematikos rinkinys. LMD darbai*. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 303-308. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/SKAICIAVIMO\\_MATEMATIKA/sm\\_SkucK\\_Stik.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/SKAICIAVIMO_MATEMATIKA/sm_SkucK_Stik.pdf)>.

4 Jakubėlienė, Kristina. Solution of two-dimensional parabolic equation with nonlocal integral boundary conditions // *Lietuvos matematikos rinkinys. LMD darbai*. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 285-290. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/Pub/Publications/52\\_TOMAS\(2011\)/SKAICIAVIMO\\_MATEMATIKA/sm\\_Jakubeliene.pdf](ftp://ftp.science.mii.lt/Pub/Publications/52_TOMAS(2011)/SKAICIAVIMO_MATEMATIKA/sm_Jakubeliene.pdf)>.

##### **Conference theses**

##### **01P - Mathematics**

1 Račkauskienė, Santa. Įvairių dzeta funkcijų jungtinė universalumo teorema // *Fizinių ir technologijos mokslų tarpdalykiniai tyrimai : pirmosios LMA Jaunųjų mokslininkų konferencijos pranešimų santrauka*, Vilnius, 2011.02.08 [elektroninis išteklius]. Vilnius : LMA leidykla, 2011. Prieiga per internetą:  
<<http://lma.lt/media/k2/attachments/SANTRAUKOS.pdf>>.

## **COOPERATION**

Belarus State University (Minsk, Belarus).

## **OTHER SCIENTIFIC ACTIVITIES**

### **Prof. A. Štikonas –**

- Editorial board member of the “*Lithuanian Mathematical Journal*”;
- Executive Editor “*Mathematical Modelling and Analysis*”.
- Deputy-Editor-in-Chief of the journal “*Nonlinear Analysis: Modelling and Control*”.
- Member of organizing committee MMA-2012 (International Conference on Mathematical Modelling and Analysis, Tallinn, Estonia)

### **Prof. M. Sapagovas –**

- Editor-in-Chief of journal “*Lithuanian mathematical journal*”.
- Member of organizing committee MMA-2011 (International Conference on Mathematical Modelling and Analysis, Sigulda, Latvia).

**Doc. Dr. O. Štikonienė –**

- Editor Secretary of journal “Lithuanian mathematical journal”.

**Prof. S. Rutkauskas –**

- Editorial board member of the Lithuanian Mathematical Journal;
- Editorial board member of the journal “Mathematical Modelling and Analysis”.

## **PROBABILITY THEORY AND STATISTICS DEPARTMENT**

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**Head** – Prof. Habil. Dr. Kęstutis Kubilius

### ***STAFF***

#### **Principal researchers:**

1. Prof. Habil. Dr. Kęstutis Kubilius,
2. Prof. Habil. Dr. Eugenijus Manstavičius,
3. Prof. Dr. (HP) Saulius Norvidas,
4. Prof. Habil. Dr. Vygantas Paulauskas,
5. Prof. Habil. Dr. Rimantas Rudzkis,
6. Prof. Habil. Dr. Jonas Kazys Sunklodas.

#### **Senior researchers:**

1. Prof. Dr. (HP) Olga Januškevičienė,
2. Assoc. Prof. Dr. Danutė Krapavickaitė,
3. Assoc. Prof. Dr. Aleksandras Plikusas,
4. Assoc. Prof. Dr. (HP) Marijus Radavičius.

#### **Affiliated principal researcher:**

1. Dr. (HP) Juozas Juvencijus Mačys.

#### **Junior researchers:**

1. Dainius Dzindzalieta,
2. Matas Šileikis.

#### **Scientist trainee:**

1. Aleksejus Bakšajėvas.

#### **Specialist:**

1. Dainius Dzindzalieta,
2. Paulius Šarka.

#### **Affairs manager:**

1. Rimantė Baltutytė.

#### **Doctoral students:**

1. Dainius Dzindzalieta,
2. Karolina Piaseckienė.

### ***RESEARCH INTERESTS***

Probability limit theorems

Characterization of probability distributions

Finite population statistics and statistical analysis of data

Nonparametric and adaptive statistical methods, analysis of high-dimensional data

## **RESEARCH PROJECTS CARRIED OUT IN 2011**

### **Projects Supported by University Budget:**

1. Statistical properties of complex random systems. Prof. **V. Bentkus** (before 2010 06 03), Prof. **J.K. Sunklodas**, Assoc. Prof. **M. Radavičius** (since 2010 06 03). 2010–2012.

The optimal estimates of some smooth metric in the central limit theorem have been obtained for random sums of independent non-identically distributed random variables. The rates of the convergence in the CLT for linear random fields have been established. Probabilities of high excursions of Gaussian fields have been investigated. The asymptotic rate of convergence in some kinds of U-statistics of second order was investigated. Asymptotics for the error term of logarithm of the least common multiple of a certain quadratic sequence has been obtained. The Cauchy transform of characteristic functions and characteristic distributions were considered. The rate of convergence of estimates for the Hurst parameter to the true value of a parameter was established. A new class of the so-called generalized DPR estimators was introduced and the asymptotic properties of these new estimators have been obtained. Extremal concentration problems for bandlimited functions (signals) were investigated.

Estimation strategy of population parameters based on panel data models is proposed and compared with traditional estimation strategies by means of simulation. In finite population setting, calibrated estimators of several types for covariance are constructed and their efficiency was compared by simulation. An estimator for the total of values of the study variable defined in the finite population has been proposed for two-phase sampling design with successive sampling and second phase stratification; variance and the estimator of variance have were studied.

### **Projects, Programmes, Issues Supported by Lithuanian State Science and Studies Foundation**

Project: *On functions and measures concentration* supported by the Research Council of Lithuania (adv. **S. Norvidas**, 2010-2011).

## **PUBLICATIONS**

### **Article(s) [indexed in Thomson Reuters Web of Science]**

#### **01P - Mathematics**

1. Paulauskas, Vygantas; Vaičiulis, Marijus. Several modifications of DPR estimator of the tail index // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 1, p. 36-50. Prieiga per internetą: <<http://www.springerlink.com/content/r825504x77667153/fulltext.pdf>>.
2. Paulauskas, Vygantas; Rachev, Svetlozar T.; Fabozzi, Frank J.. Comment on "weak convergence to a matrix stochastic integral with stable processes" // Econometric theory. Cambridge : Cambridge University Press. ISSN 0266-4666. 2011, Vol. 27, no. 4, p. 907-911.
3. Manstavičius, Eugenijus. A limit theorem for additive functions defined on the symmetric group // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 2, p. 220-232. Prieiga per internetą: <<http://www.springerlink.com/content/9314q|1610212130/fulltext.pdf>>.
4. Mielkaitis, Edgaras; Paulauskas, Vygantas. Rates of convergence in the CLT for linear random fields // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 2, p. 233-250. Prieiga per internetą: <<http://www.springerlink.com/content/37v701407u858605/fulltext.pdf>>.
5. Sunklodas, Jonas Kazys. Some estimates of the normal approximation for  $\phi$ -mixing random variables // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 2, p. 260-273. Prieiga per internetą: <<http://www.springerlink.com/content/p725qn2p2285p561/fulltext.pdf>>.

6. Sunklodas, Jonas Kazys. Some estimates of the normal approximation for independent non-identically distributed random variables // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 1, p. 66-74. Prieiga per internetą: <<http://www.springerlink.com/content/q341949271022u66/fulltext.pdf>>.
7. Krapavickaitė, Danutė. Some models for estimation of total of a study variable having many zero values // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 3, p. 370-384. Prieiga per internetą: <<http://www.springerlink.com/content/q482gk8k75003054/fulltext.pdf>>.
8. Norvidas, Saulius. Approximation of entire functions of exponential type by exponential sums // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 4, p. 522-532. Prieiga per internetą: <<http://www.springerlink.com/content/d1u7481847670331/fulltext.pdf>>.
9. Nekrašaitė-Liegė, Vilma; Radavičius, Marijus; Rudys, Tomas. Model-based design in small area estimation // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 3, p. 417-424. Prieiga per internetą: <<http://www.springerlink.com/content/9p26k0382111x8k4/fulltext.pdf>>.
10. Manstavičius, Eugenijus; Žilinskas, Žydrūnas. On a variance related to the Ewens sampling formula // Nonlinear analysis : modelling and control. Vilnius : Institute of Mathematics and Informatics. ISSN 1392-5113. 2011, vol. 16, no. 4, p. 453-466. Prieiga per internetą: <<http://www.lana.lt/journal/43/NA16406.pdf>>.

#### Article(s) [indexed in Thomson Reuters Web of Science]

##### 09P - Informatics

1. Kubilius, Kęstutis; Melichov, Dmitrij. On comparison of the estimators of the Hurst index of the solutions of stochastic differential equations driven by the fractional Brownian motion // Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos mokslų akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 1, p. 97-114. Prieiga per internetą: <<http://www.mii.lt/informatica/pdf/INFO807.pdf>>.

#### Article(s) in DB approved by Research Council of Lithuania

##### 01P - Mathematics

1. Januškevičienė, Olga [Yanushkevichiene, O.]. On bounds in limit theorems for some U-statistics // Теория вероятностей и ее применения. Москва : изд-во "Наука". ISSN 0040-361X. 2011, т. 56, № 4, [1-15 p.].

#### Reviewed article(s)

##### 01P - Mathematics

1. Uzdanavičiūtė, Roma; Rudzakis, Rimantas. Baltijos šalių sektorinių akcijų kainų indeksų VAR modelis // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 332-337. Prieiga per internetą: <[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/STATISTIKA/sta\\_Uzdanav\\_Rudzakis.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/STATISTIKA/sta_Uzdanav_Rudzakis.pdf)>.
2. Остапенко, А.; Januškevičienė, Olga [Янушкявичене, О.]. К вопросу об эффективности овладения математической информацией // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 128-133. Prieiga per internetą: <[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MAT\\_INFORMATIKOS\\_DESTYMAS/met\\_Ostapenko\\_Janus.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MAT_INFORMATIKOS_DESTYMAS/met_Ostapenko_Janus.pdf)>.
3. Браницкая, Л.Л.; Januškevičienė, Olga [Янушкявичене, О.Л.]. К вопросу о сходимости случайных полиномов второго порядка // Фундаментальные и прикладные задачи современной математики : сборник научных трудов. Москва : МФТИ, 2011. ISBN 9785741703380. с. 5-11.
4. Mačys, Juozas Juvencijus. Funkcinės lygtys kaip mokyklinė tema // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 122-127. Prieiga per internetą: <[ftp://ftp.science.mii.lt/Pub/Publications/52\\_TOMAS\(2011\)/MAT\\_INFORMATIKOS\\_DESTYMAS/met\\_Macys.pdf](ftp://ftp.science.mii.lt/Pub/Publications/52_TOMAS(2011)/MAT_INFORMATIKOS_DESTYMAS/met_Macys.pdf)>.
5. Murauskas, Gediminas; Radavičius, Marijus. Studentų internetinės apklausos duomenų analizė // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 321-326. Prieiga per internetą: <[ftp://ftp.science.mii.lt/Pub/Publications/52\\_TOMAS\(2011\)/STATISTIKA/sta\\_Murausk\\_Radavicius.pdf](ftp://ftp.science.mii.lt/Pub/Publications/52_TOMAS(2011)/STATISTIKA/sta_Murausk_Radavicius.pdf)>.
6. Piaseckienė, Karolina; Radavičius, Marijus. Lietuvių kalbos vaizdingumo raiškos priemonių analizė // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 220-224. Prieiga per internetą: <[ftp://ftp.science.mii.lt/Pub/Publications/52\\_TOMAS\(2011\)/MAT\\_TAIKYMAI\\_II/mtaik\\_Piasec\\_Radavicius.pdf](ftp://ftp.science.mii.lt/Pub/Publications/52_TOMAS(2011)/MAT_TAIKYMAI_II/mtaik_Piasec_Radavicius.pdf)>.

#### Theses in other reviewed publications

##### 01P - Mathematics

1. Manstavičius, Eugenijus. Limit theorems for additive functions defined on permutations // Limit theorems in probability and number theory, January 14-15, 2011, Paderborn : programme and abstracts. Paderborn :

Universität Paderborn, 2011. p. 13-14.

#### Conference theses

##### 01P - Mathematics

1. Manstavičius, Eugenijus. Some results in combinatorics influenced by probabilistic number theory // 27th Journées Arithmétiques, June 27 - July 1, 2011, Vilnius, Lithuania : programme and abstract book. Vilnius : Vilniaus universitetas, 2011. p. 42-43. Prieiga per internetą: <<http://atlas-conferences.com/cgi-bin/abstract/cbbv-24>>.
2. Šarka, Paulius; Dubickas, Artūras. Sumsets of sparse sets // 27th Journées Arithmétiques, June 27 - July 1, 2011, Vilnius, Lithuania : programme and abstract book. Vilnius : Vilniaus universitetas, 2011. p. 59. Prieiga per internetą: <<http://atlas-conferences.com/cgi-bin/abstract/cbbv-51>>.

**Padalinys I: 580000 - MATEMATIKOS IR INFORMATIKOS INSTITUTAS**

#### Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)

##### 07T - Informatics engineering

1. Pyž, Gražina; Šimonytė, Virginija; Slivinskas, Vytautas. Joining of vowel and semivowel models in Lithuanian speech formant-based synthesizer // Electrical and control technologies : proceedings of the 6th international conference, ECT 2011 / Kaunas University of Technology, IFAC Committee of National Lithuanian Organisation, Lithuanian Electricity Association. Kaunas : Technologija. ISSN 1822-5934. 2011, p. 114-119.

#### Article(s) [indexed in Thomson Reuters Web of Science]

##### 07T - Informatics engineering

1. Pyž, Gražina; Šimonytė, Virginija; Slivinskas, Vytautas. Modelling of Lithuanian speech diphthongs // Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos mokslų akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 3, p. 411-434. Prieiga per internetą: <<http://www.mii.lt/informatica/pdf/INFO834.pdf>>.

#### Conference theses

##### 01P - Mathematics

1. Pyž, Gražina; Šimonytė, Virginija; Slivinskas, Vytautas. Garsų modeliavimas tiesinėmis dinaminėmis sistemomis // Fizinių ir technologijos mokslų tarpdalykiniai tyrimai : pirmosios LMA Jaunųjų mokslininkų konferencijos pranešimų santrauka, Vilnius, 2011.02.08 [elektroninis išteklius]. Vilnius : LMA leidykla, 2011. Prieiga per internetą: <<http://lma.lt/media/k2/attachments/SANTRAUKOS.pdf>>.

## COOPERATION

- Ohio University (USA)
- University of Southern Denmark
- National Taras Shevchenko Kyiv University (Ukraine)
- VU Matematikos ir informatikos fakultetas
- Vilniaus Gedimino Technikos Universitetas
- Bielefeld university Collaborative Research Centre "Spectral Structures and Topological Methods in Mathematics"
- Participation in the steering committee and organization of the activities of the Baltic-Nordic-Ukrainian network on survey statistics  
<https://wiki.helsinki.fi/display/BNU/Organisation>

## OTHER SCIENTIFIC ACTIVITIES

#### Doc. D. Krapavickaitė –

- Editor in Chief of the journal „Lietuvos statistikos darbai“ 2011.  
[www.statisticsjournal.lt](http://www.statisticsjournal.lt)
- Associate editor of the journal „Statistics in Transition“.  
[http://www.stat.gov.pl/cps/rde/xbcr/pts/SiT\\_11\\_1.pdf](http://www.stat.gov.pl/cps/rde/xbcr/pts/SiT_11_1.pdf)

- Member of the programme committee of the Workshop on Survey Sampling Theory and Methodology, August 2011, Valmiera, Latvia.
- Reviewer of the paper to “Nonlinear analysis”.

**Prof. K. Kubilius –**

- Managing Editor of the Lithuanian Mathematical Journal.  
<http://www.springer.com/mathematics/journal/10986?detailsPage=editorialBoard>
- Editorial board member of the Mathematical Modelling and Analysis.  
<http://inga.vgtu.lt/~art/>

**Prof. E. Manstavičius –**

- Section Editors of the Lithuanian Mathematical Journal.
- Member of the organizing committee of the „Journées Arithmétique 27”, Vilnius, June, 2011.
- Member of the organizing committee of the 5<sup>th</sup> international conference „Analytic and Probabilistic Methods in Number Theory”, Palanga, September, 2011.

**Dr. S. Norvidas –**

- Editorial board member of the Lithuanian Mathematical Journal.
- Scientific supervisor of doctoral student D. Dzindzalieta.
- Referee of scientific journals: Mathematical Reviews, Zentralblatt MATH, Functional Analysis and Its Applications, Russian Mathematics, Acta Mathematica Hungarica.

**Prof. V. Paulauskas –**

- Section Editor of the Lithuanian Mathematical Journal.
- Section Editor and member of Advisory board of the Central European Mathematical Journal.

**Doc. A. Plikusas –**

- Member of the steering committee of the Baltic- Nordic Ukrainian network on survey statistics: <http://wiki.helsinki.fi/display/BNU/Organisation>.
- Member of the organizing committee of the workshop on survey sampling theory and methodology in Valmiera, Latvia, August, 2012.  
<http://wiki.helsinki.fi/display/BNU/Events>

**Prof. R. Rudzkis –**

- Editorial board member of the Lithuanian Mathematical Journal,
- Editorial board member of the journal “Прикладная эконометрика”.
- Editorial board member of the journal „Lietuvos statistikos darbai”.
- Editorial board member of the journal “Pinigų studijos”.
- The supervisor of the Postdoc student Aleksej Bakshaev according to the project Postdoctoral Fellowship Implementation in Lithuania (VP1-3.1-ŁMM-01).

## **RECOGNITION PROCESSES DEPARTMENT**

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**Head** – Dr. Gintautas Tamulevičius

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**Senior researchers (2):** Prof. Dr. Habil. Adolfas Laimutis Telksnys, Assoc. Prof. Dr. Rimantas Pupeikis.

**Researchers (1):** Dr. Gintautas Tamulevičius.

**Engineer researchers (1):** Jonas Kaukėnas.

**Engineers (1):** Linas Makutėnas.

**Senior specialists (1):** Evaldas Robertas Ožeraitis.

**Specialists (1):** Deividas Eringis.

**Technical assistants (1):** Marija Ramutė Pajedienė.

**Doctoral students (5):** Živilė Ringelienė, Gintarė Kučiauskienė, Robertas Mažeika, Gražina Pyž, Vladislav Pnevski.

### ***RESEARCH INTERESTS***

Random processes analysis and recognition.

### ***RESEARCH PROJECTS CARRIED OUT IN 2010***

#### **Projects Supported by University Budget**

- Recognition of short-term specific random elements in random sequences based heart rate analysis is investigated.
- The possibility to use visual features (extracted from the images of a speaking person's face) and neural networks for Lithuanian speech recognition is explored.
- Issue of recursive approach for parametric identification of Wiener systems is analyzed. An approach based on sequential reconstruction of the values of intermediate is proposed for the estimation of parameters of the Wiener system.

#### **International Science Programmes and Projects**

- ADHER (ADOPT YOUR HERITAGE). Supported by the European Union in Lifelong Learning Programme. 2009–2011. Assoc. Prof. Dr. Nerutė Kligienė / L. Mikalauskienė.

### ***PUBLICATIONS***

**Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

**07T - Informatics engineering**

1 Kligienė, Stanislava Nerutė; Rapečka, Aurimas. Challenges of Digital Era: Potential and Pitfalls of Social Media. Ethics and Trust in Collaborative Cross-Domains // COLLA 2011: The First International Conference on Advanced Collaborative Networks, Systems and Applications, June 19-24, 2011 Luxembourg. Luxembourg :



IARIA, 2011. ISBN 9781612081434. p. 34-39. Prieiga per internetą:  
<[http://www.thinkmind.org/index.php?view=article&articleid=colla\\_2011\\_2\\_20\\_50021](http://www.thinkmind.org/index.php?view=article&articleid=colla_2011_2_20_50021)>.

#### **Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

##### **08S - Communication and Information**

1 Kligienė, Stanislava Nerutė; Rapečka, Aurimas. Challenges of Digital Era: Potential and Pitfalls of Social Media. . Ethics and Trust in Collaborative Cross-Domains // COLLA 2011: The First International Conference on Advanced Collaborative Networks, Systems and Applications, June 19-24, 2011 Luxembourg. Luxembourg : IARIA, 2011. ISBN 9781612081434. p. 34-39. Prieiga per internetą:  
<[http://www.thinkmind.org/index.php?view=article&articleid=colla\\_2011\\_2\\_20\\_50021](http://www.thinkmind.org/index.php?view=article&articleid=colla_2011_2_20_50021)>.

#### **Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

##### **09P - Informatics**

1 Kligienė, Stanislava Nerutė; Rapečka, Aurimas. Challenges of Digital Era: Potential and Pitfalls of Social Media. . Ethics and Trust in Collaborative Cross-Domains // COLLA 2011: The First International Conference on Advanced Collaborative Networks, Systems and Applications, June 19-24, 2011 Luxembourg. Luxembourg : IARIA, 2011. ISBN 9781612081434. p. 34-39. Prieiga per internetą:  
<[http://www.thinkmind.org/index.php?view=article&articleid=colla\\_2011\\_2\\_20\\_50021](http://www.thinkmind.org/index.php?view=article&articleid=colla_2011_2_20_50021)>.

#### **Paper(s) in the reviewed Lithuanian conference proceedings**

##### **09P - Informatics**

1 Rapečka, Aurimas; Dzemyda, Gintautas. Rekomendacinių sistemų ir jose naudojamų rekomendavimo . algoritmų apžvalga // XV kompiuterininkų konferencijos mokslo darbai. Vilnius : Žara, 2011. ISBN 9789986342618.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **07T - Informatics engineering**

1 Kaklauskas, Artūras; Zavadskas, Edmundas Kazimieras; Pruskus, Valdas; Vlasenko, Andrej; Bartkienė, Lina; . Pališkieienė, Rasa; Žemecykė, Lina; Gerštein, Violeta; Dzemyda, Gintautas; Tamulevičius, Gintautas. Recommended biometric stress management system // Expert Systems with Applications. Oxford : Pergamon-Elsevier Science Ltd. ISSN 0957-4174. 2011, vol. 38, no. 11, p. 14011-14025. Prieiga per internetą:  
<[http://www.sciencedirect.com/science?\\_ob=MiailmImageURL&\\_cid=271506&\\_user=10020463&\\_pii=S0957417411007366&\\_check=y&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=2011-10-31&wchp=dGLzVIS-zSkzk&md5=b7f329f937c797532723611e9a80f680/1-s2.0-S0957417411007366-main.pdf](http://www.sciencedirect.com/science?_ob=MiailmImageURL&_cid=271506&_user=10020463&_pii=S0957417411007366&_check=y&_origin=browse&_zone=rslt_list_item&_coverDate=2011-10-31&wchp=dGLzVIS-zSkzk&md5=b7f329f937c797532723611e9a80f680/1-s2.0-S0957417411007366-main.pdf)>.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **09P - Informatics**

- 1 Pupeikis, Rimantas. On recursive parametric identification of Wiener systems // Information technology and . control / Kauno technologijos universitetas. Kaunas : Technologija. ISSN 1392-124X. 2011, t. 40, no. 1, p. 21-28. Prieiga per internetą: <<http://itc.ktu.lt/>>.
- 2 Kazlauskas, Kazys. The Burg algorithm with extrapolation for improving the frequency estimation // . Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos mokslų akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 2, p. 177-188. Prieiga per internetą:  
<<http://www.mii.lt/informatica/pdf/INFO828.pdf>>.
- 3 Telksnys, Adolfas Laimutis; Kaukėnas, Jonas. Recognition of short-time specific random elements in random . sequences // Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos mokslų akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 2, p. 279-288. Prieiga per internetą:  
<<http://www.mii.lt/informatica/pdf/INFO823.pdf>>.
- 4 Lileikytė, Rasa; Telksnys, Adolfas Laimutis. Quality estimation methodology of speech recognition features // . Elektronika ir elektrotechnika / Kauno technologijos universitetas. Kaunas : Technologija. ISSN 1392-1215. 2011, nr. 4, p. 113-116. Prieiga per internetą:  
<[http://www.ktu.lt/lt/mokslas/zurnalai/elektros\\_z/z110/26\\_\\_ISSN\\_1392-1215\\_Quality%20Estimation%20Methodology%20of%20Speech%20Recognition%20Features.pdf](http://www.ktu.lt/lt/mokslas/zurnalai/elektros_z/z110/26__ISSN_1392-1215_Quality%20Estimation%20Methodology%20of%20Speech%20Recognition%20Features.pdf)>.

#### **Article(s) in DB approved by Research Council of Lithuania**

##### **09P - Informatics**

- 1 Lančinskas, Algirdas; Žilinskas, Julius; Ortigosa, Pilar Martinez. Local optimization in global Multi-Objective . Optimization Algorithms // 2011 Third World Congress on Nature and Biologically Inspired Computing (NaBiC), 19 - 21 October 2011, Spain. Salamanca : IEEE, 2011. ISBN 9781457711220. p. 323-328. Prieiga per internetą:  
<<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6089613>>.
- 2 Galiauskas, Nerijus; Žilinskas, Julius. Kvadratinio programavimo uždaviniai // Jaunųjų mokslininkų darbai / . Šiaulių universitetas. Šiauliai : Šiaulių universiteto leidykla. ISSN 1648-8776. 2011, nr. 4, p. 115-118. Prieiga per internetą: <[http://www.su.lt/bylos/mokslo\\_leidiniai/jmd/11\\_04\\_33/galiauskas\\_zilinskas.pdf](http://www.su.lt/bylos/mokslo_leidiniai/jmd/11_04_33/galiauskas_zilinskas.pdf)>.

3 Ringelienė, Živilė; Filipovič, Mark. Žodžių atpažinimo, grįsto paslėptaisiais Markovo modeliais, vizualizavimo ir . analizės programinė įranga // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 63-72. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/63-72.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/63-72.pdf)>.

#### **Reviewed article(s)**

##### **01P - Mathematics**

1 Pupeikis, Rimantas. On recursive stopping of decimation of discrete-time bandlimited signals // Lietuvos . matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 338-342. Prieiga per internetą: <[ftp://ftp.science.mii.lt/Pub/Publications/52\\_TOMAS\(2011\)/TEORINE\\_INFORMATIKA/tin\\_Pupeikis.pdf](http://ftp.science.mii.lt/Pub/Publications/52_TOMAS(2011)/TEORINE_INFORMATIKA/tin_Pupeikis.pdf)>.

#### **Conference theses**

##### **09P - Informatics**

1 Lančinskas, Algirdas; Žilinskas, Julius; Ortigosa, Pilar Martinez. Lokalūs optimizavimas globaliojo . daugiakriterinio optimizavimo algoritmuose // Fizinių ir technologijos mokslų tarpdalykiniai tyrimai : pirmosios LMA Jaunųjų mokslininkų konferencijos pranešimų santrauka, Vilnius, 2011.02.08 [elektroninis išteklius]. Vilnius : LMA leidykla, 2011. Prieiga per internetą: <<http://lma.lt/media/k2/attachments/SANTRAUKOS.pdf>>.

2 Rapečka, Aurimas; Dzemyda, Gintautas. Rekomendacinėse sistemose naudojamų duomenų tyrimas // . Operacijų tyrimai versle, inžinerijoje ir informacinėse technologijose : 4-oji Lietuvos jaunųjų mokslininkų konferencija, 2011 m. rugsėjo 30 d. : programa ir tezės. Kaunas : Technologija, 2011. p. 12-13.

## **COOPERATION**

- Lithuanian university of educational sciences (Lithuania)
- Kaunas university of technology, Faculty of telecommunications and electronics (Lithuania)
- Vilnius Gediminas technical university, Faculty of civil engineering (Lithuania)
- Šiauliai university, Faculty of social welfare and disability studies (Lithuania)
- Hospital of Lithuanian university of health sciences, Kauno klinikos (Lithuania)
- Algoritmų sistemos (Lithuania)

## **OTHER SCIENTIFIC ACTIVITIES**

### **Prof. Dr. Habil. Kazys Kazlauskas –**

- Member of Lithuanian Computer Society  
<http://www.liko.lt>
- Member of Lithuanian Mathematical Society  
<http://www.mif.vu.lt/lmd/>
- Member of Lithuanian Scientific Society  
<http://www.lms.lt/?q=en/members>

### **Prof. Dr. Habil. Adolfas Laimutis Telksnys –**

- Member of Council on Digitization of Lithuanian Cultural Heritage
- Member of the Working group WG 7.1 Modeling and Simulation of the International Federation of Information Processing (IFIP)  
<http://www.ifip.org/bulletin/bulltcs/memtc07.htm#wg71>
- Editorial board member of:
  - International journal *Informatica*  
(<http://www.mii.lt/Informatica/editors.htm>)
  - International journal *Information Technology and Control*  
(<http://www.itc.ktu.lt/index.php/ITC/about/editorialTeam>)
  - Journal *Informacijos mokslai*

- <http://www.leidykla.vu.lt/lt/mokslo-darbai/informacijos-mokslai/informacijos-mokslai-2011-55-tomas/redaktoriu-kolegija/>
- International journal *Tamkang Journal of Science and Engineering*  
[http://www2.tku.edu.tw/~tkjse/editorial\\_board-en.htm](http://www2.tku.edu.tw/~tkjse/editorial_board-en.htm)

**Assoc. Prof. Dr. Rimantas Pupeikis –**

- Reviewer for the international journal *Informatica*  
<http://www.mii.lt/Informatica/>
- Member of Lithuanian Computer Society  
<http://www.liks.lt>
- Member of Lithuanian Mathematical Society  
<http://www.mif.vu.lt/lmd/>
- Member of Lithuanian Scientific Society  
<http://www.lms.lt/?q=en/members>

**SYSTEMS ANALYSIS DEPARTMENT**

(Note: Operational Research sector of the Department [presents separate data](#))

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**Head** – Prof. Habil. Dr. *Gintautas Dzemyda*

**STAFF**

**Chief research staff members:** prof. habil. dr. G. Dzemyda, prof. habil. dr. J. Mockus, prof. habil. dr. A. Žilinskas, dr. (HP) J. Žilinskas

**Senior research staff members:** habil. dr. A. Garliauskas, dr. A. Jakaitienė, dr. O. Kurasova, dr. S. Minkevičius, dr. A. Raudys

**Affiliated senior research staff members:** A. Pakštas

**Research staff members:** dr. J. Bernatavičienė, dr. J. Gordevičius, dr. R. Karbauskaitė, dr. V. Marcinkevičius, dr. V. Medvedev, dr. P. Treigys, dr. D. Šešok

**Junior research staff members:** A. Igumenov, V. Jančauskas, A. Lančinskas, R. Paulavičius

**Researchers:** L. Mikalauskienė

**Engineer researchers:** V. Tiešis

**Engineer programmers:** J. Katina, L. Ringienė

**Doctoral students:** G. Balkys, D. Baronas, G. Bazilevičius, E. Filatovas, N. Galiauskas, A. Igumenov, V. Jančauskas, E. Jasutė, I. Katin, J. Katina, R. J. Kizlaitis, R. Kraujutis, J. Kuznecov, A. Lančinskas, M. Liogys, K. Mikėnas, A. Molytė, O. Niakšu, K. Paulauskienė, J. Pragarauskaitė, T. Pranckevičius, A. Rapečka, L. Ringienė, T. Ringys, J. Stašionis, P. Stefanovič, G. Vaira, I. Vinogradova

**RESEARCH INTERESTS**

Data mining; Visualization of multidimensional data; Global optimization methods; Local optimization methods; Medical data analysis and decision support; Stochastic programming; Neural networks; Education data mining; Multiple criteria decision support systems; Statistical analysis of multidimensional data using neural networks; Parallel computing; Creation and computational realization of complex simulation models in epidemiology, state

education and state energy supply systems and of various other origin with uncertainty; Optimal control applications; Bayesian analysis; Network modeling.

## **RESEARCH PROJECTS CARRIED OUT IN 2011**

### **Projects Supported by University Budget**

Project title: „Decisions in optimization, modeling and visualization problems“.

Main results:

1. The efficiency of the maximum likelihood estimator of intrinsic dimensionality of high-dimensional data has been optimized.
2. The way to realize a set of methods for the multidimensional data visualization via Web-services has been developed.
3. The conditions optimizing the computational expenditure in SAMANN neural network training for visualization of large data sets have been discovered.
4. A version of P-algorithm for implementation in the arithmetic of infinity is proposed.
5. New models of financial markets are developed, the school scheduling model is improved, Pareto-Lipschitz optimization method is proposed.
6. Simplicial algorithms for copositivity detection, copositive programming and nonlinear regression have been proposed.
7. Integration of the self-organizing map and neural gas with multidimensional scaling.
8. Investigation and evaluation of influence of learning rates and neighboring functions on self-organizing maps.
9. Introduction and in-depth analysis of greedy algorithms for Parsimonious temporal aggregation operator to be used in applications that process large amount of time-varying data.

**(Pateikiamas trumpas 2011 m. mokslinės veiklos rezultatų aprašymas (apie 450 spaudos ženklų).**

### **Projects, Programmes, Issues Supported by Lithuanian State Science and Studies Foundation**

1. Project „Liquidity analysis in order to reduce investment costs in the stock markets“. Contract No. MIP-20/2010. Dr. A. Raudys. 2010-2011.
2. Project „Global optimization algorithms with simplicial partitions“. Contract No. MIP-108/2010. Dr. (HP) J. Žilinskas. 2010-2011.
3. Project funded by MITA and pursued with ORGSOFT “Methods and software for business processes modelling and visualization”, Contract 31V-145, Prof. A. Žilinskas
4. Joint Activity Agreement No. BS-580000-1892 with LLC „Algoritmų sistemos“ for the eMentorius project. 2011-2012.

### **Governmental Science Programmes and Research Projects Ordered by the Branch Ministries**

#### **Ordered Research Projects (pateikiamas vykdomų užsakomųjų darbų sąrašas (Lietuvos ir užsienio užsakovai))**

1. Innovation voucher. Contract No. 3IV-137. Dr. (HP) J. Žilinskas. 2011

### **International Science Programmes and Projects**

1. COST action „Open European Network for High Performance Computing on Complex Environments“. Contract No. IC0805. Dr. (HP) J. Žilinskas. 2009-2013.
2. COST action „Combining Soft Computing Techniques and Statistical Methods to Improve Data Analysis Solutions“. Contract No. IC0702. Dr. O. Kurasova. 2008-2012.
3. COST action „Algorithmic Decision Theory“. Contract No. IC0602. Prof. habil. dr. A. Žilinskas. 2007-2011.

4. LLP Erasmus Thematic Networks programme “Teaching, Research, Innovation in Computing Education”. Project number 142399-LLP-1-2008-1-BG-ERASMUS-ENM. Agreement No. 2008-3258/001-001. Prof. habil. dr. A. Žilinskas. 2008-2011.
5. Eurostars project “Production effectiveness navigator, PEN”, No. E!6232. Prof. habil. dr. G. Dzemyda. 2011-2014.

## **PUBLICATIONS**

### **Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

#### **07T - Informatics engineering**

- 1 Dzemyda, Gintautas; Marcinkevičius, Virginijus; Medvedev, Viktor. Large-scale multidimensional data . visualization: a Web service for data mining // Towards a service-based internet : 4th European Conference, ServiceWave 2011, Poznan, Poland, October 26-28, 2011: proceedings. Book Series : Lecture Notes in Computer Science. Vol. 6994 Berlin : Springer, 2011. ISBN 9783642247545. p. 14-25.
- 2 Kligienė, Stanislava Nerutė; Rapečka, Aurimas. Challenges of Digital Era: Potential and Pitfalls of Social Media . Ethics and Trust in Collaborative Cross-Domains // COLLA 2011: The First International Conference on Advanced Collaborative Networks, Systems and Applications, June 19-24, 2011 Luxembourg. Luxembourg : IARIA, 2011. ISBN 9781612081434. p. 34-39. Prieiga per internetą: <[http://www.thinkmind.org/index.php?view=article&articleid=colla\\_2011\\_2\\_20\\_50021](http://www.thinkmind.org/index.php?view=article&articleid=colla_2011_2_20_50021)>.

### **Conference proceedings paper(s) (Thomson Reuters - ISI proceedings)**

#### **09P - Informatics**

- 1 Stefanovič, Pavel; Kurasova, Olga. Influence of Learning Rates and Neighboring Functions on Self-Organizing . Maps // Advances in Self-Organizing Maps : 8th International Workshop, WSOM 2011, Espoo, Finland, June 13-15, 2011: Proceedings. Book Series : Lecture Notes in Computer Science. Vol. 6731. Berlin : Springer, 2011. ISBN 9783642215650. p. 141-150.

### **Paper(s) in reviewed international conference proceedings**

#### **09P - Informatics**

- 1 Vaira, Gintaras; Kurasova, Olga. Parallel Bidirectional Dijkstra's Shortest Path Algorithm // Frontiers in artificial . intelligence and applications. Vol. 224 : Databases and information systems. VI: selected papers from the 9th International Baltic Conference, DB&IS 2010 / edited by Janis Barzdins, Marite Kirikova Amsterdam : IOS Press, 2011. ISBN 9781607506874. p. 422-435.
- 2 Sakalauskas, Leonidas; Vaičiulytė, Ingrida. Estimation of shape parameter of the multivariate t-skew . distribution // Applied Stochastic Models and Data Analysis (ASMDA2011) : 14th Conference of the ASMDA International Society Rome, Italy, 7 - 10 June 2011 : proceedings [Elektroninis optinis diskas]. Roma : Edizioni ETS, 2011. ISBN 9788846730459. p. 1211-1218.
- 3 Jakaitienė, Audronė. Postgraduate Students' Attitudes towards Methodologies of Teaching Medical Statistics . // Proceedings of the International Conference on E-learning and the Knowledge Society (e-Learning'11), 25-26 August 2011, Bucharest, Romania. Bucharest : Publishing House of Academy of Economic Studies, 2011. ISBN 9786065054608. p. 242-247.
- 4 Raudys, Šarūnas; Raudys, Aistis. High Frequency Trading Portfolio Optimisation: Integration of financial and . human factors // ISDA 2011 : Intelligent systems design and applications : 11th international conference, November 22-24, 2011 - Córdoba, Spain Cordoba : IEEE, 2011. ISBN 9781457716751. p. 696-701.
- 5 <delayed> Sakalauskas, Leonidas; Vaičiulytė, Ingrida. Estimation of skew t-distribution by the Monte-Carlo . Markov Chain approach // SMTDA 2010 : Stochastic Modeling Techniques and Data Analysis : international conference, Chania, Crete, Greece, 8-11 June 2010 : proceedings [Elektroninis optinis diskas]. Crete, 2010. [1-7 p.].

### **Paper(s) in the reviewed Lithuanian conference proceedings**

#### **09P - Informatics**

- 1 Skerla, Andrius; Marcinkevičius, Virginijus; Treigys, Povilas. Vartotojų elgsenos atpažinimas iš internetinių . svetainių žurnalų // Mokslo taikomųjų tyrimų įtaka šiuolaikinių studijų kokybei : 4-osios respublikinės mokslinės-praktinės konferencijos mokslinių straipsnių rinkinys, 2011 Vilnius : Vilniaus kolegija, 2011. ISSN 2029-2279. p. 114-118.
- 2 Marozas, Justinas; Treigys, Povilas; Marcinkevičius, Virginijus. Rainelės ir vyzdžio atpažinimas skaitmeniniuose . vaizduose // Mokslo taikomųjų tyrimų įtaka šiuolaikinių studijų kokybei : 4-osios respublikinės mokslinės-praktinės konferencijos mokslinių straipsnių rinkinys, 2011 Vilnius : Vilniaus kolegija, 2011. ISSN 2029-2279. p. 85-92.
- 3 Rapečka, Aurimas; Dzemyda, Gintautas. Rekomendacinių sistemų ir jose naudojamų rekomendavimo . algoritmų apžvalga // XV kompiuterininkų konferencijos mokslo darbai. Vilnius : Žara, 2011. ISBN

9789986342618.

4 Kurilov, Jevgenij [Kurilovas, Eugenijus]; Vinogradova, Irina; Žilinskienė, Inga. Analitinio hierarchinio proceso . (AHP) metodo taikymas nuotolinių mokymo kursų naudotojų sąsajos kokybei vertinti // XV kompiuterinių konferencijos mokslo darbai. Vilnius : Žara, 2011. ISBN 9789986342618. p. 87-98.

#### **Paper(s) in non-reviewed international conference proceedings**

##### **09P - Informatics**

1 Mockus, Jonas; Stašionis, Justas. On the experimental investigation of Pareto-Lipschitzian optimization // . Theoretical and applied aspects of cybernetics: proceedings of the international scientific conference of students and young scientists. Kyiv: Bukrek, 2011. ISBN 9789663993102. p. 204-206.

**Spaudinio rūšis: P2c** - Straipsnis nerecenzuojamoje Lietuvos konferencijos medžiagoje

##### **09P - Informatics**

1 Kuznecov, Jurij. Interneto programų karkasų PHP kalbai apžvalga // Kompiuterinių dienų - 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 34-46.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **01P - Mathematics**

1 Baronas, Darius; Ivanauskas, Feliksas; Baronas, Romas. Mechanisms controlling the sensitivity of . amperometric biosensors in flow injection analysis systems // Journal of mathematical chemistry. Dordrecht : Springer Netherlands. ISSN 0259-9791. 2011, vol. 49, no. 8, p. 1521-1534. Prieiga per internetą: <<http://www.springerlink.com/content/2240213513164k88/fulltext.pdf>>.

2 Dzemyda, Gintautas; Marcinkevičius, Virginijus; Medvedev, Viktor. Web application for large-scale . multidimensional data visualization // Mathematical modelling and analysis = Matematinis modeliavimas ir analizė / Vilnius Gediminas Technical University, Institute of Mathematics and Informatics Vilnius : Technika. ISSN 1392-6292. 2011, vol. 16, no. 2, p. 273-285. Prieiga per internetą: <<http://www.tandfonline.com/doi/pdf/10.3846/13926292.2011.580381>>.

3 Žilinskas, Antanas [Žilinskas, Antanas]. Small sample estimation of parameters for Wiener process with noise . // Communications in statistics : theory and methods. Philadelphia : Taylor & Francis INC. ISSN 0361-0926. 2011, vol. 40, no 16 : XIII International Conference on Applied Stochastic Models and Data, p. 3020-3028. Prieiga per internetą: <<http://www.tandfonline.com/doi/pdf/10.1080/03610926.2011.562788>>.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **07T - Informatics engineering**

1 Kaklauskas, Artūras; Zavadskas, Edmundas Kazimieras; Pruskus, Valdas; Vlasenko, Andrej; Bartkienė, Lina; . Pališkienė, Rasa; Žemeckytė, Lina; Gerštein, Violeta; Dzemyda, Gintautas; Tamulevičius, Gintautas. Recommended biometric stress management system // Expert Systems with Applications. Oxford : Pergamon-Elsevier Science Ltd. ISSN 0957-4174. 2011, vol. 38, no. 11, p. 14011-14025. Prieiga per internetą: <[http://www.sciencedirect.com/science?\\_ob=MiamiImageURL&\\_cid=271506&\\_user=10020463&\\_pii=S0957417411007366&\\_check=y&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=2011-10-31&wchp=dGLzVIS-zSkz&md5=b7f329f937c797532723611e9a80f680/1-s2.0-S0957417411007366-main.pdf](http://www.sciencedirect.com/science?_ob=MiamiImageURL&_cid=271506&_user=10020463&_pii=S0957417411007366&_check=y&_origin=browse&_zone=rslt_list_item&_coverDate=2011-10-31&wchp=dGLzVIS-zSkz&md5=b7f329f937c797532723611e9a80f680/1-s2.0-S0957417411007366-main.pdf)>.

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##### 09P - Informatics

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#### COOPERATION

- Vilnius Pedagogical University, Vilnius, Lithuania
- Vilnius Gediminas Technical University, Vilnius, Lithuania
- Kaunas University of Technology, Kaunas, Lithuania
- Vytautas Magnus University, Kaunas, Lithuania
- Šiauliai University, Šiauliai, Lithuania
- Klaipėda University, Klaipėda, Lithuania
- Mykolas Romeris University, Vilnius, Lithuania

- University College London, UK
- University of Almeria, Spain
- The University of Edinburgh, UK
- University of Groningen, The Netherlands
- Poznan Supercomputing and Networking Center, Poland
- Middle East Technical University, Ankara, Turkey
- Jyvaskyla University, Finland
- Ismir University of Economics, Turkey
- London Metropolitan University, UK

### ***OTHER SCIENTIFIC ACTIVITIES***

#### **Prof. habil. dr. G. Dzemyda –**

- editorial board member of the International Journal *Informatica* (IOSPress/VU), executive editor, <http://www.mii.lt/Informatica/editors.htm>
- editorial board member of Eastern and Central Europe Journal *Informatics in Education*, [http://www.mii.lt/informatics\\_in\\_education/editors.htm](http://www.mii.lt/informatics_in_education/editors.htm)
- editorial board member of the International Journal *Scientific Proceedings of Riga Technical University. Computer Science. Information Technology and Management Science*, <http://www.rtu.lv/en/content/view/3817/2100/lang,en/#5>
- editorial board member of the *Journal of Civil Engineering and Management*, [http://www.jcem.vgtu.lt/en/?page=2&sub=RED\\_KOLEGIJA](http://www.jcem.vgtu.lt/en/?page=2&sub=RED_KOLEGIJA)
- editorial board member of the *Nonlinear Analysis; Modelling and Control*, deputy-editor-in-chief, <http://www.mii.lt/NA/>
- member of Lithuanian Computer Society, <http://www.liks.lt/>
- member of Lithuanian Mathematical Society, <http://www.mif.vu.lt/lmd/>
- member of Lithuanian Operational Research Society, <http://www.mii.lt/LitORS/>
- member of IFIP Technical Committee 12 Artificial Intelligence, <http://www.ifiptc12.org.uk/ifiptc12/members.php>

#### **Prof. habil. dr. A. Žilinskas –**

- member of editorial boards of international journals:
  - *Journal of Global Optimization* (Springer), <http://www.springer.com/business+%26+management/operations+research/journal/10898?detailsPage=editorialBoard>
  - *Control and Cybernetics*, <http://control.ibspan.waw.pl:3000/mainpage/index>
  - *Informatica* (IOSPress/VU), <http://www.mii.lt/Informatica/editors.htm>
  - *Journal of Intelligent Learning Systems and Applications*, <http://www.scirp.org/journal/jilsa/>
  - *International Journal of Grid and High Performance Computing*, <http://www.igi-global.com/Bookstore/TitleDetails.aspx?TitleId=1105&DetailsType=ReviewBoard>
  - *The Open Cybernetics and Systemics Journal*, <http://www.bentham.org/open/tocsj/EBM.htm>
- expert of EU Eurostars
- nominated expert in EU FP7 Information and Communication Technology panel
- member of IFIP working group WG 7.6 Optimization-Based Computer Aided Modeling and Design, <http://www.ifip.org/bulletin/bulltcs/memtc07.htm>
- member of American Mathematical Society
- member of programme committees of the following International conferences:
  - CompSysTech 11, Vienna, Austria, 16-17 June, 2011.
  - 17th International Conference, Information Technology, Kaunas, April 27-29, 2011.
  - Workshop on computational optimization, Szczecin, Poland, September 18-21, 2011.

- E-learning'11, Bucharest, Romania, August 25-26, 2011.

**Prof. habil. dr. J. Mockus –**

- editor-in-chief of International Journal *Informatica* (IOSPress/VU), <http://www.mii.lt/Informatica/editors.htm>
- member of editorial board of International Journal *Journal of Global Optimization* (Springer), <http://www.springer.com/business+%26+management/operations+research/journal/10898?detailsPage=editorialBoard>
- member of American Mathematical Society <http://www.ams.org/cml>
- member of IFIP Technical Committee WG 7.7 Stochastic Optimization, <http://www.ifip.org/bulletin/bulltcs/memtc07.htm>

**Dr. (HP) J. Žilinskas –**

- member of editorial boards of international journals:
  - Central European Journal of *Computer Science* (Springer/Versita), <http://versita.net/cejcs/editors/>
  - Central European Journal of *Engineering* (Springer/Versita), <http://versita.net/ceje/editors/>
  - *Computational Management Science* (Springer), <http://www.springer.com/business+%26+management/operations+research/journal/10287?detailsPage=editorialBoard>
  - *Informatica* (IOSPress/VU), <http://www.mii.lt/informatica/editors.htm>
  - *Mathematical Modelling and Analysis* (Taylor&Francis/VGTU), <http://www.tandf.co.uk/journals/journal.asp?issn=1392-6292&linktype=145>
  - *Optimization Letters* (Springer), <http://www.springer.com/mathematics/journal/11590?detailsPage=editorialBoard>
- nominated expert of Lithuania at COST domain Information and Communication Technologies, <http://w3.cost.esf.org/index.php?id=31>
- member of working group WG 4.3 "Numerical Libraries, Solvers & Algorithms" of European Exascale Software Initiative (EESI), [http://www.eesi-project.eu/pages/menu/project/working-groups.php?wp\\_id=9](http://www.eesi-project.eu/pages/menu/project/working-groups.php?wp_id=9)
- member of management committee of COST action "Open European Network for High Performance Computing on Complex Environments", [http://w3.cost.esf.org/index.php?id=177&action\\_number=IC0805](http://w3.cost.esf.org/index.php?id=177&action_number=IC0805)
- member of board of Lithuanian Operational Research Society (member society of EURO and IFORS), head of working group Optimization Methods and Applications, <http://www.mii.lt/LitORS/>
- member of the ESF Standing Committee for Physical and Engineering Sciences, <http://www.esf.org/research-areas/physical-and-engineering-sciences/about/standing-committee/membership-of-the-esf-standing-committee-for-physical-and-engineering-sciences-pesc.html>

**Habil. dr. A. Garliauskas –**

- referee of international journals:
  - *Informatica* (IOSPress/VU)
  - *IEEE Transactions on Neural Networks*
- member of Lithuanian Science Society Council, <http://www.lms.lt/>
- chair person of Informatics Department of Lithuanian Science Society, <http://lms.lt/?q=en/society/browse/22>
- member of Intelligent Systems Research Laboratory at the College of Engineering, <http://www.engr.usask.ca/>

- member of Special Interest Group on Nonlinear Dynamics (SIG/NL), <http://www.acm.org/sigs>
- member of Neuroscience Special Interest Group (SIG), <http://www.inns.org/sig/>
- member of ABI research advisory board, <http://www.abiworldwide.com/>

**Dr. O. Kurasova –**

- reviewer of international journals:
  - *Informatica* (IOSPress/VU)
  - *Mathematical Modelling and Analysis* (Taylor & Francis)
  - *Journal of Visualization* (Springer)
  - *Mechanical Systems and Signal Processing* (Elsevier)
  - *Informatics in Education* (VU)
- member of Lithuanian Computer Society (Artificial Intelligence Section), <http://www.liks.lt/>
- member of Lithuanian Mathematical Society, <http://www.mif.vu.lt/lmd/>
- member of Lithuanian Operational Research Society, <http://www.mii.lt/LitORS/>
- member of management committee of COST action „Combining Soft Computing Techniques and Statistical Methods to Improve Data Analysis Solutions“, [http://w3.cost.eu/index.php?id=110&action\\_number=IC0702](http://w3.cost.eu/index.php?id=110&action_number=IC0702)

**Dr. A. Jakaitienė –**

- referee of the international journals:
  - *Journal of Global Optimization* (Springer)
  - *Optimization Letters* (Springer)
  - *Lithuanian Mathematical Journal* (Springer)
- member of Lithuanian Mathematical Society, <http://www.mif.vu.lt/lmd/>
- member of Lithuanian Statistics Society, [http://www.statistikusajunga.lt/index.php?option=com\\_content&task=view&id=10&Itemid=12](http://www.statistikusajunga.lt/index.php?option=com_content&task=view&id=10&Itemid=12)

**V. Tiešis –**

- reviewer of international journals:
  - *Journal of Global Optimization* (Springer)
  - *Informatica* (IOSPress/VU)
- member of Lithuanian Mathematical Society, <http://www.mif.vu.lt/lmd/>

**OPERATIONAL RESEARCH SECTOR  
AT THE SYSTEM ANALYSIS DEPARTMENT**

Akademijos 4, LT-08663 Vilnius

Tel.+3705 2109323 fax +3705 2729209

E-mail sakal at ktl.mii.lt

**Head** – Prof. Habil. Dr. Leonidas Sakalauskas

**STAFF**

**Principal researchers:**

- Leonidas Sakalauskas

**Senior researchers:**

- Vaida Bartkutė-Norkūnienė

- Saulius Minkevičius

**Researchers:**

- Igoris Belovas
- Jurgis Sušinskas

**Technical assistants:**

- Gintautas Jakimauskas

**Doctoral students:**

- Valerijonas Dumskis
- Liudas Kaklauskas
- Saulius Preidys
- Loreta Savulionienė
- Ingrida Vaičiulytė
- Ana Ušpūrienė

***RESEARCH INTERESTS***

Operational Research, Queueing theory, Stochastic Optimization

***RESEARCH PROJECTS CARRIED OUT IN 2011***

**Projects Supported by University Budget**

Application of knowledge-based technologies to monitoring, analysis and design of information networks

Wide spread of information networks becomes the engine for development of modern technologies. Computers in information networks generate enormous amounts of data, discovery and extraction of knowledge from which is an important tool for gaining concurrence abilities in the modern dynamic environment of research and business. Exploration and control problems of information networks that are the most complicated work, created by human mind and hands, are often solved by approaching the methods of data analysis (data mining) and queuing theory. However latter methods might be also successfully applied in many analysis and decision tasks, which occur in networks, existing in wide spectrum of business and social systems. Research focusses on following tasks aiming to main goals of the theme:

1. Network monitoring in on-line mode.
2. Queing methods for network control and design
3. Search engine optimization
4. Open source technologies

***PUBLICATIONS*** (see: in the [list of VU IMI System Analysis Department publications](#))

***COOPERATION***

- University Federal Rio de Janeiro, Brazil
- Ballarat University, Australia

***OTHER SCIENTIFIC ACTIVITIES***

**Prof. Habil. Dr. L. Sakalauskas –**

- Editorial board member of Journal *Technological and Economic Development of Economy*, <http://www.tandf.co.uk/journals/journal.asp?issn=2029-4913&linktype=145>
- Elected member of International Statistical Institute (2001), <http://isi-web.org/>

- Member of European Working Group on Continuous Optimization, <http://www.iam.metu.edu.tr/EUROPT/>
- Chairman of Organising Committee of the XXV EURO Conference, <http://www.euro-2012.lt>
- Member of Programming Committee of Workshop "Stochastic Programming for Implementation and Advanced Applications", <http://www.mii.lt/stoprog-2012>
- Member of Programming Committee of Workshop "Advances in Continuous Optimization", <http://www.mii.lt/europt-2012>
- Chair of 4<sup>th</sup> National Young Scientists Conference of the Lithuanian OR Society, <http://www.mii.lt/OT-2011>

**Dr. Vaida Bartkutė-Norkūnienė –**

- Member of the Bernulli Society of Mathematical Statistics
- Co-chair of the European Working Group Workshop „Advances in Continuous Optimization“, Šiauliai, July 5–7, 2012, <http://www.mii.lt/EUROPT-2012>

**Dr. I. Belovas –**

- Reviewer of international journal *Mathematical Modelling and Analysis* (Taylor & Francis)
- Member of *Lithuanian Mathematical Society*, <http://www.mif.vu.lt/lmd/>

**SOFTWARE ENGINEERING DEPARTMENT**

(Note: Mathematical Logic Sector of the Department presents [separate data](#))

Akademijos str. 4, LT-08663 Vilnius  
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**Head** – Prof. Dr. *Albertas Čaplinskas*

**STAFF**

**Chief research fellows:** Prof. Dr. A. Čaplinskas, Prof. Dr. D. Dzemydienė (part-time).

**Senior research fellow:** Doc. Dr. A. Lupeikienė.

**Research fellows:** Dr. S. Maskeliūnas, Dr. V. Paliulionis.

**Assistant research fellow:** L. Paliulionienė.

**Engineer programmer:** J. Miliauskaitė (part-time).

**Doctoral students:** D. Drungilas, R. Dzindzalieta, G. Gricius, M. Kaziliūnas (till 31 October 2011), M. Kurmis, J. Miliauskaitė, A. Miliauskas, S. Svanidzaitė, M. Šaučiūnas, Ž. Vaira (till 30 September 2011).

**RESEARCH INTERESTS**

Software engineering  
Information system engineering  
Software service engineering

**RESEARCH PROJECTS CARRIED OUT IN 2011**

**Projects Supported by University Budget**

**Service-oriented systems engineering problems.** Prof. Dr. A. Čaplinskas (leader), D. Drungilas, Prof. D. Dzemydienė, R. Dzindzalieta, G. Gričius, M. Kaziliūnas, J. Miliauskaitė, Doc. Dr. A. Lupeikienė, Dr. S. Maskeliūnas, L. Paliulionienė, Dr. V. Paliulionis, S. Svanidzaitė, M. Šaučiūnas, Ž. Vaira. 2009-2011.

Main results obtained in 2011: Subset of 23 GoF object oriented design patterns (20 GoF patterns) identified that solve paradigm-independent design problems and can be transformed into pure aspect oriented design patterns; rules to transform 20 GoF design patterns into aspect oriented design patterns; a method for modeling obstacle limitation surfaces of an aerodrome using GIS technology; a fast and effective algorithm of creating three-dimensional digital site model using airborne laser scanning (LIDAR) data; experimental software “Akis-AER” implementing the method and algorithm; evaluation of suitability of Internet service search technologies for e-commerce; software architecture for the integrated environment protection decision support system that provides tools to monitor quality of water sources and to analyze collected data using E-nets and other artificial intelligence methods; conceptual analysis and evaluation of web service composition modularization methods; proposition how to improve conceptual frameworks of service negotiation processes from the trust modelling perspective; comparison of object-oriented and service-oriented software development processes.

### **Ordered Research Projects**

*Joint Activity Agreement No. BS-580000-1892* with LLC „Algoritmų sistemos“ for the *eMentorius* project. Dr. S. Maskeliūnas. 2011-2012.

### **International Science Programmes and Projects**

European joint programme *Eurostars*‘ project *Production effectiveness navigator* (pen!6232 PEN). Prof. Dr. A. Čaplinskas, Doc. Dr. A. Lupeikienė. 2011-2014.

*Agreement No. 31V-134* to fund *Eurostars* programme project *Production effectiveness navigator* (pen!6232 PEN). Funded by the Agency for Science, Innovation and Technology. Prof. Dr. A. Čaplinskas, Doc. Dr. A. Lupeikienė. 2011.

### **PUBLICATIONS**

#### **Paper(s) in the reviewed international conference proceedings**

##### **09P - Informatics**

1. Vaira, Žilvinas; Čaplinskas, Albertas. Case study towards implementation of pure aspect-oriented factory method design pattern // PATTERNS 2011 : the 3rd international conferences on pervasive patterns and applications. Roma : IARIA, 2011. ISBN 9781612081588. p. 102-107.

#### **Paper(s) in the reviewed Lithuanian conference proceedings**

##### **09P - Informatics**

1. Bielskis, Antanas Andrius; Dzemydienė, Dalė; Drungilas, Darius; Gričius, Gediminas; Gorochovik, Andrej; Gadliauskaitė, Rasa. Afekto atpažinimo metodų lyginamoji analizė // XV kompiuterininkų konferencijos mokslo darbai. Vilnius : Žara, 2011. ISBN 9789986342618. p. 19-32.

**Spaudinio rūšis: P2b** - Straipsnis nerecenzuojamoje Lietuvos tarptautinės konferencijos medžiagoje

##### **09P - Informatics**

1. Dzemydienė, Dalė; Kurmis, Mindaugas; Andziulis, Arūnas. Heterogeneous service support and perspectives in vehicular communication networks // Social technologies' 11 : ICT social transformations : conference proceedings. Vilnius : Mykolo Romerio universitetas, 2011. ISBN 9789955193784. p. 96-98.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

##### **09P - Informatics**

1. Vaira, Žilvinas; Čaplinskas, Albertas. Software engineering paradigm independent design problems, GoF 23 design patterns, and aspect design // Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos

moksly akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 2, p. 289-317. Prieiga per internetą: <<http://www.mii.lt/informatica/pdf/INFO831.pdf>>.

**Article(s) in DB approved by Research Council of Lithuania**

**08S - Communication and Information**

1. Maskeliūnas, Saulius. Lietuvos mokslo produkcijos vertinimo įtaka Lietuvos mokslo žurnalų leidybai // Mokslo ir technikos raida = Evolution of science and technology. Vilnius : Technika. ISSN 2029-2430. 2011, Vol. 3, no. 2, p. 129-138. Prieiga per internetą: <<http://www.est.vgtu.lt/index.php/est/article/view/est.2011.11>>.

**Article(s) in DB approved by Research Council of Lithuania**

**09P - Informatics**

1. Vaira, Žilvinas; Čaplinskas, Albertas. Application of pure aspect-oriented design patterns in the development of AO frameworks : a case study // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 146-155. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/146-155.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/146-155.pdf)>.
2. Šaučiūnas, Marius; Čaplinskas, Albertas. Automated e-contract negotiation in web service environment : trust management aspects // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 108-118. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/108-118.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/108-118.pdf)>.
3. Miliauskaitė, Jolanta; Čaplinskas, Albertas. Pasaulinio saityno paslaugų kompozicijų skaidymas į modulius // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 73-84. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/73-84.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/73-84.pdf)>.
4. Čaplinskas, Albertas; Lupeikienė, Audronė; Paliulionienė, Laima. Internetinių paslaugų paieškos technologijų vertinimas jų tinkamumo internetinei prekybai požiūriu // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 85-97. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/85-97.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/85-97.pdf)>.
5. Paliulionis, Viktoras. Aerodromų kliūtis ribojančių paviršių modeliavimas geoinformacinių technologijų priemonėmis // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 56, p. 119-127. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-56/119-127.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-56/119-127.pdf)>.
6. Kaziliūnas, Marius. Programinės paslaugos modeliai ir jų ryšys su architektūriniais sprendimais // Informacijos mokslai / Vilniaus universitetas. Vilnius : Vilniaus universiteto leidykla. ISSN 1392-0561. 2011, t. 57, p. 124-133. Prieiga per internetą: <[http://www.leidykla.eu/fileadmin/Informacijos\\_mokslai/2011-57/124-138.pdf](http://www.leidykla.eu/fileadmin/Informacijos_mokslai/2011-57/124-138.pdf)>.

**Overview paper(s)**

**08S - Communication and Information, 09P - Informatics**

1. Maskeliūnas, Saulius; Eriksonas, Linas. Lithuania in the context of the European Digital Agenda // IT STAR. 2011, vol. 9, no. 1, p. 7-8. Prieiga per internetą: <[http://www.scholze-simmel.at/starbus/download/nl\\_1\\_11.pdf](http://www.scholze-simmel.at/starbus/download/nl_1_11.pdf)>.

**Other paper(s)**

**07T - Informatics engineering, 09P - Informatics**

1. Otas, Alfredas; Dagys, Viktoras; Maskeliūnas, Saulius; Žandarai, Aidai. Lietuvos kompiuterininkų sąjungos veikla 2009-2011 metais // Kompiuterininkų dienos - 2011. Vilnius : Žara, 2011. ISBN 9789986342625. p. 7-19.

**Part(s) of book(s)**

**07T - Informatics engineering, 09P - Informatics**

1. Dzemydienė, Dalė; Maskeliūnas, Saulius. Development of multi-componential decision support system in dynamically changing application domain of environment protection // Efficient decision support systems - practice and challenges from current to future / edited by Chiang S. Jao. Rijeka : InTech, 2011. ISBN 9789533073262. p. 405-422. Prieiga per internetą: <<http://www.intechopen.com/articles/show/title/development-of-multi-componential-decision-support-system-in-dynamically-changing-application-domain>>.

***COOPERATION in the organization of conferences:***

Kaunas University of Technology (Lithuania)

Vilnius Gediminas Technical University (Lithuania)

University of Latvia (Latvia)

Riga Technical University (Latvia)

Tallinn University of Technology (Estonia)



Slovak University of Technology in Bratislava (Slovakia)  
University of Maribor (Slovenia)  
University of Vienna (Austria)  
Institute for Problems of Informatics of the Russian Academy of Science (Russia)  
Institute for System Programming of the Russian Academy of Science (Russia)  
University of St.-Petersburg (Russia)  
Charles University (Czech Republic)  
Technical University of Varna (Bulgaria)  
Poznan University of Technology (Poland)  
Tampere University of Technology (Finland)  
University of Novi Sad (Serbia)  
Aristotle University (Greece)  
Yerevan State University (Armenia)  
National Taras Shevchenko University of Kyiv (Ukraine)  
Christian-Albrechts-University Kiel (Germany)

### ***OTHER SCIENTIFIC ACTIVITIES***

**Prof. Dr. A. Čaplinskas –**

- editorial board member of the journal *Informatica*,  
<http://www.mii.lt/informatica/editors.htm>;
- editorial board member of the journal *Computer Science and Information Technologies (Scientific papers university of Latvia)*,  
<http://www.lu.lv/materiali/apgads/raksti/756.pdf>;
- editorial board member of the *Scientific Journal of Riga Technical University. Computer Sciences*, <http://versita.com/sjrtucs/editors/>;
- steering committee member of the annual East European Conference on Advances in Databases and Information Systems (ADBIS);
- steering committee member of the Central and Eastern European Conference on Software Engineering Techniques (CEE-SET), <http://cee-set.njszt.hu/committees>;
- program committee member of the 15th East European Conference on Advances in Databases and Information Systems (ADBIS), Vienna, Austria, September 20 – 23, 2011, <http://www.ifs.tuwien.ac.at/ADBIS2011/program.html>;
- program committee member of the International Conference on Computer Systems and Technologies (CompSysTech), Vienna, Austria, June 16-17, 2011,  
<http://www.compsystech.org/index.php?cmd=dPage&pid=pc>;
- technical program committee member of the First International Conference on Business Intelligence and Technology (BUSTECH), Rome, Italy, September 25-30, 2011,  
<http://www.iaria.org/conferences2011/ComBUSTECH11.html>;
- program committee member of the Central & Eastern European Software Engineering Conference in Russia (CEE-SEC(R)), Moscow, Russia, October 31 – November 3, 2011, <http://www.secr.ru/lang/en-en/for-speakers/program-committee>;
- program committee member of the 5th IFIP TC2 Central and Eastern European Conference on Software Engineering Techniques (CEE-SET'2011), University of Debrecen, Hungary, August 25-26, 2011, <http://cee-set.njszt.hu/committees>;
- program committee member of the 4th International Workshop on Information Logistics and Knowledge Supply for Viable Enterprises (ILOG), Riga, Latvia, October 6, 2011, <http://bir2011.rtu.lv/content/workshop-ILOG>;

- program committee member of the 20th International Conference on Information Systems Development (ISD), Edinburgh, Scotland, August 24-26, 2011, <http://www.macs.hw.ac.uk/ISD2011/committee.php>;
- program committee member of the 17th International Conference on Information and Software Technologies (IT), Kaunas, Lithuania, April 27-29, 2011, <http://isd.ktu.lt/it2011/>;
- program committee member of the IFIP WG 8.1 Working Conference on Method Engineering – ME'11 Engineering Methods in the Service-Oriented Context (ME'11), Paris, France, April 20-22, 2011, [http://crinfo.univ-paris1.fr/ME11/prog\\_committee.php](http://crinfo.univ-paris1.fr/ME11/prog_committee.php);
- program committee co-chair and reviewer of the Fourteenth International Scientific Conference „Computer Days – 2011“, Klaipėda, Lithuania, September 22-24, 2011, <http://www.liks.lt/modules/news/article.php?storyid=31>.

#### **Prof. Dr. D. Dzemydienė –**

- editorial board member of the *Scientific Journal of Riga Technical University. Computer Sciences*, <http://versita.com/sjrtucs/editors/>;
- editorial board member of the journal *Technological and Economical Development of Economy*, [http://www.tede.vgtu.lt/en/?page=2&sub=RED\\_KOLEGIJA](http://www.tede.vgtu.lt/en/?page=2&sub=RED_KOLEGIJA);
- editorial board member of the *International Journal of Electronic Security and Digital Forensics (IJESDF)*, <http://www.inderscience.com/browse/index.php?journalID=217#board>;
- editorial board member of the electronic journal *Social technologies*, [http://www.mruni.eu/en/mokslo\\_darbai/st/redaktoriu\\_kolegija/](http://www.mruni.eu/en/mokslo_darbai/st/redaktoriu_kolegija/);
- deputy editor-in-chief of the international scientific research journal of Mykolas Romeris University *Intellectual Economics*, [http://www3.mruni.eu/~int.economics/redkolegija\\_en.html](http://www3.mruni.eu/~int.economics/redkolegija_en.html);
- scientific advisory committee member of the International Academic Conference on Social Technologies'11, Vilnius, Lithuania, November 17-18, 2011, [http://www.mruni.eu/en/university/faculties/soc\\_informatikos\\_fakultetas/konferencijos/](http://www.mruni.eu/en/university/faculties/soc_informatikos_fakultetas/konferencijos/)
- reviewer of the Fourteenth International Scientific Conference „Computer Days – 2011“, Klaipėda, Lithuania, September 22-24, 2011, <http://www.liks.lt/modules/news/article.php?storyid=31>.

#### **Doc. Dr. A. Lupeikienė –**

- editorial board member of the journal *Informatica*, <http://www.mii.lt/informatica/editors.htm>;
- editorial board member of the *Scientific Journal of Riga Technical University. Computer Sciences*, <http://versita.com/sjrtucs/editors/>;
- program committee member of the First International Workshop on User Oriented Information Integration (UOII 2011), Riga, Latvia, October 6-8, 2011, <http://www.lu.lv/uoi/workshop-chairs-and-pc-members/>;
- program committee member of the First International Workshop on Alignment of Business Process and Security Modelling (ABPSM'11), Riga, Latvia, October 6, 2011, <http://events.idi.ntnu.no/abpsm11/>;
- reviewer of the International Symposium on Information System and Software Engineering (ISSE 2011), March 27th - 30th, 2011 – Orlando, Florida, USA, <http://www.iiis2011.org/iceme/Website/AdditionalReviewers.asp?vc=44>;

- reviewer of the Fourteenth International Scientific Conference „Computer Days – 2011“, Klaipėda, Lithuania, September 22-24, 2011, <http://www.liks.lt/modules/news/article.php?storyid=31>.

**Dr. S. Maskeliūnas –**

- program committee co-chair and reviewer of the Fourteenth International Scientific Conference „Computer Days – 2011“, Klaipėda, Lithuania, September 22-24, 2011, <http://www.liks.lt/modules/news/article.php?storyid=31>.

**Dr. V. Paliulionis –**

- reviewer of the Fourteenth International Scientific Conference „Computer Days – 2011“, Klaipėda, Lithuania, September 22-24, 2011, <http://www.liks.lt/modules/news/article.php?storyid=31>.

**MATHEMATICAL LOGIC SECTOR  
at the SOFTWARE ENGINEERING DEPARTMENT**

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**Head** – Assoc. Prof. Habil. Dr. Regimantas Ričardas Pliuškevičius

***STAFF***

**Principal researchers:** Prof. Habil. Dr. S. Jukna (associated researcher)

**Senior researchers:** Assoc. Prof. Habil. Dr. R. Pliuškevičius, Dr. R. Alonderis, Assoc. Prof. Dr. J. Sakalauskaitė.

**Doctoral students:** H. Giedra, A. Girčys

***RESEARCH INTERESTS***

- Proof theory of non-classical logics
- Automated deduction
- Decision procedures
- Boolean function complexity
- Lower bounds

***RESEARCH PROJECTS***

***RESEARCH PROJECTS CARRIED OUT IN 2011***

**Projects Supported by University Budget**

Efficient proof methods for logics of knowledge; graphic structure and complexity of logic functions. Assoc. Prof. Habil. Dr. R. Pliuškevičius, 2009-2011.

The scientific research were realized in two areas: (1) automated reasoning in non-classical logic; (2) complexity of Boolean functions. In the first area, the following problems have been investigated: (a) elimination of contraction rules from sequent calculi of modal logics; (b) possibility to use classical rules in sound proof-search of intuitionistic propositional sequents. (c) partial cut elimination from sequent calculi for multimodal logics. Concerning point (a) contraction-free sequent calculi for logics KD45 and S5 are constructed. Concerning the point (b) new conditions of sound transition to classical rules in proof-search of intuitionistic propositional sequents are presented. Concerning the point (c) sequent calculi with restricted cut rule for combinations of modal logics with temporal logic are constructed. In the second area, the following problems have been investigated: (a) lower bounds for Boolean circuits of logarithmic depth; (b) the well-known Knapsack ("Rucksack") problem. Concerning item (a), a conjecture about the minimal rank of partially defined Boolean matrices is formulated and partially confirmed. The conjecture implies super-linear lower bounds for Boolean circuits of logarithmic depth. Concerning item (b), exponential lower bounds on the complexity of dynamic programming algorithms solving the Knapsack problem are obtained.

### Ordered Research Projects

**Deutsche Forschungsgemeinschaft (DFG) grant SCHN 503/5-1: Limits of algorithmic paradigms.** Prof. S. Jukna, 2010-2013.

### PUBLICATIONS

#### Monograph

##### 01P - Mathematics

1 Jukna, Stasys. Extremal combinatorics : with applications in computer science. Berlin : Springer, 2011. XXIII, . 411p. : illustr. ISBN 9783642173639.

#### Article(s) [indexed in Thomson Reuters Web of Science]

##### 01P - Mathematics

1 Jukna, Stasys; Schnitger, Georg. Min-rank conjecture for log-depth circuits // Journal of Computer and System . Sciences. Maryland Heights : Academic Press. ISSN 0022-0000. 2011, vol. 77, iss. 6, p. 1023-1038. Prieiga per internetą:

<[http://www.sciencedirect.com/science?\\_ob=MIAMIURL&\\_cid=272574&\\_user=1017010&\\_pii=S002200011000778&\\_check=y&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=2011-11-30&wchp=dGLzVIS-zSkWb&md5=2ff41ff2c1f81edd3ab7cbaf2018ba2e/1-s2.0-S002200011000778-main.pdf](http://www.sciencedirect.com/science?_ob=MIAMIURL&_cid=272574&_user=1017010&_pii=S002200011000778&_check=y&_origin=browse&_zone=rslt_list_item&_coverDate=2011-11-30&wchp=dGLzVIS-zSkWb&md5=2ff41ff2c1f81edd3ab7cbaf2018ba2e/1-s2.0-S002200011000778-main.pdf)>.

2 Jukna, Stasys; Schnitger, Georg. Yet harder knapsack problems // Theoretical computer science. Amsterdam : Elsevier BV. ISSN 0304-3975. 2011, vol. 412, iss. 45, p. 6351-6358. Prieiga per internetą:

<[http://www.sciencedirect.com/science?\\_ob=MIAMIURL&\\_cid=271538&\\_user=1017010&\\_pii=S0304397511005913&\\_check=y&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=2011-10-21&wchp=dGLzVBA-zSkzk&md5=f1f5f3255afdc2a1cae8175774b62fc2/1-s2.0-S0304397511005913-main.pdf](http://www.sciencedirect.com/science?_ob=MIAMIURL&_cid=271538&_user=1017010&_pii=S0304397511005913&_check=y&_origin=browse&_zone=rslt_list_item&_coverDate=2011-10-21&wchp=dGLzVBA-zSkzk&md5=f1f5f3255afdc2a1cae8175774b62fc2/1-s2.0-S0304397511005913-main.pdf)>.

#### Reviewed article(s)

##### 01P - Mathematics

1 Sakalauskaitė, Jūratė. Partial cut elimination for combinations of propositional multi-modal logics with past . time // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 257-261. Prieiga per internetą:

<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Sakalauskaite.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Sakalauskaite.pdf)>.

2 Giedra, Haroldas; Sakalauskaitė, Jūratė. Sequent calculus for logic of correlated knowledge // Lietuvos . matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 243-248. Prieiga per internetą:

<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Giedra\\_Sakal.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Giedra_Sakal.pdf)>.

3 Girčys, Aurimas Paulius; Pliuškevičius, Regimantas Ričardas. A specialization of definitions in common . knowledge logic // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 249-252. Prieiga per internetą:

<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Gircys\\_Pliusk.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Gircys_Pliusk.pdf)>.

4 Alonderis, Romas; Pliuškevičius, Regimantas Ričardas. Cut, invariant rule, and loop-check free sequent calculus

- . for PLTL // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 231-236. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Alonderis\\_Pliusk.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Alonderis_Pliusk.pdf)>.
- 5 Alonderis, Romas. A sequent calculus for propositional temporal logic with time gaps // Lietuvos matematikos .rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 225-230. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Alonderis.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Alonderis.pdf)>.
- 6 Andrikonis, Julius; Pliuškevičius, Regimantas Ričardas. Contraction-free calculi for modal logics S5 and KD45 // Lietuvos matematikos rinkinys. LMD darbai. Vilnius : Matematikos ir informatikos institutas. ISSN 0132-2818. 2011, t. 52, p. 237-242. Prieiga per internetą:  
<[ftp://ftp.science.mii.lt/pub/publications/52\\_TOMAS\(2011\)/MATEMATINE\\_LOGIKA/mlog\\_Andrikonis\\_Pliusk.pdf](ftp://ftp.science.mii.lt/pub/publications/52_TOMAS(2011)/MATEMATINE_LOGIKA/mlog_Andrikonis_Pliusk.pdf)>.

## ***COOPERATION***

- University of Frankfurt
- St.Petersburg Scientific Center of Russian Academy of Science (Russia)
- Faculty of Mathematics and Informatics (Vilnius University)
- Kaunas University of Technology (Lithuania)

## ***OTHER SCIENTIFIC ACTIVITIES***

### **Prof. Habil. Dr. S. Jukna –**

- scientific board member of ECCC, Electronic Colloquium on Computational Complexity; <http://eccc.hpi-web.de/>
- editorial board member of the Lithuanian Mathematical Journal; [http://www.mii.lt/index.php?siteaction=pages.ed&page=lmj\\_an&lang=en](http://www.mii.lt/index.php?siteaction=pages.ed&page=lmj_an&lang=en).

### **Assoc. Prof. Habil. Dr. R.Pliuškevičius –**

- editorial board member of the Lithuanian Mathematical Journal; [http://www.mii.lt/index.php?siteaction=pages.ed&page=lmj\\_an&lang=en](http://www.mii.lt/index.php?siteaction=pages.ed&page=lmj_an&lang=en).
- member of the American Mathematical Society, <http://www.ams.org>;
- reviewer of Mathematical Reviews (USA).
- reviewer of Computing Reviews (USA).

## **STOCHASTIC PROCESSES DEPARTMENT**

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Prof. Habil. Dr Kęstutis Kubilius  
Prof. Habil. Dr Remigijus Leipus  
Prof. Dr Remigijus Mikulevičius (associated scientist)  
Prof. Habil. Dr Rimas Norvaiša  
Prof. Habil. Dr Henrikas Pragarauskas  
Prof. Habil. Dr Alfredas Račkauskas  
Prof. Habil. Dr Artūras Dubickas

**Senior researchers:**

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Dr Martynas Manstavičius  
Dr Marijus Vaičiulis  
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**Researcher:**

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Donata Puplinskaite

**Specialist:**

Šarūnas Dirmeikis  
Gintaras Valiukevičius

**Affairs manager:**

Jurgita Zinkevičienė

**Doctoral student:**

Raimondas Malukas

**RESEARCH INTERESTS** inference for long memory processes, modeling financial data, long range dependence, heavy tails, aggregation, self-similar processes, Levy processes, rough paths, concrete functional calculus, stochastic partial differential equations, random Hamiltonians, MV-algebras, insurance mathematics.

**RESEARCH PROJECTS CARRIED OUT IN 2011**

**Projects Supported by University Budget**

1. Stochastic Equations for Random Processes and Fields. B. Grigelionis, H. Pragarauskas. 2008-2011.

Dawson-Watanabe type superprocesses in random environment, modelled by the finite state Markov process, are defined and studied. Stochastic nonlinear filtering equations are derived. Reduced form of these equations are also found. Pathwise stochastic differential equations with respect to functions having bounded  $p$ -variation are defined and studied. Smoothness of solutions of such equations was proved under suitable hypotheses.

2. Modeling of financial returns and statistical inferences. D. Surgailis. 2008-2011.

A statistic based on increment ratios (IR) and related to zero crossings of increment sequence was defined and studied for measuring the roughness of random paths. The main advantages of this statistic are robustness to smooth additive and multiplicative trends and applicability to infinite variance processes. The existence of the IR statistic limit (called the IR-roughness) is closely related to the existence of a tangent process. Three particular cases where the IR-roughness exists and is

explicitly computed include diffusion processes with smooth coefficients, rough Gaussian processes without stationarity assumptions, and Levy processes admitting a stable tangent process. In all these cases, convergence rates of the IR statistic are obtained.

## **Projects, Programmes, Issues Supported by Lithuanian State Science and Studies Foundation**

Project: Calculus of rough functions and applications in econometrics. R. Norvaisa, 2010-2011.

Project: Modelling long memory and heavy tails in finance and insurance. D. Surgailis, R. Leipus. 2011-2012

## **PUBLICATIONS**

### **Monograph**

#### **01P - Mathematics**

1 Dudley, Richard M.; Norvaiša, Rimas. Concrete Functional Calculus. New York : Springer, 2011. XII, 671 p. ISBN .9781441969491.

#### **Paper(s) in reviewed international conference proceedings**

#### **01P - Mathematics**

1 Dubickas, Artūras. On metric heights of algebraic numbers // Diophantine approximation: state of the art and applications = Диофантовы приближения. Современное состояние и приложения : proceedings of the international conference, July 3rd - July 9th, 2011, Minsk. Минск : Институт математики НАН Беларуси. ISBN 9789856499664. p. 22-24.

#### **Article(s) [indexed in Thomson Reuters Web of Science]**

#### **01P - Mathematics**

1 Paulauskas, Vygtas; Vaičiulis, Marijus. Several modifications of DPR estimator of the tail index // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 1, p. 36-50. Prieiga per internetą: <<http://www.springerlink.com/content/r825504x77667153/fulltext.pdf>>.

2 Yang, Yang; Wang, Kaiyong; Leipus, Remigijus; Šiauly, Jonas. Tail behavior of sums and maxima of sums of dependent subexponential random variables // Acta applicandae mathematicae. ISSN 0167-8019. 2011, vol. 114, no 3, p. 219-231. Prieiga per internetą: <<http://www.springerlink.com/content/r44075112144113r/fulltext.pdf>>.

3 Leipus, Remigijus; Šiauly, Jonas. Finite-horizon ruin probability asymptotics in the compound discrete-time risk model // Lithuanian mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 2, p. 207-219. Prieiga per internetą: <<http://www.springerlink.com/content/000k630rn224m4ph/fulltext.pdf>>.

4 Yang, Y.; Leipus, Remigijus; Šiauly, Jonas; Cang, Yuquan. Uniform estimates for the finite-time ruin probability in the dependent renewal risk model // Journal of mathematical analysis and applications. San Diego : Academic Press Inc Elsevier Science. ISSN 0022-247X. 2011 vol. 383, no. 1, p. 215-225. Prieiga per internetą: <[http://www.sciencedirect.com/science?\\_ob=MIimg&\\_imagekey=B6WK2-52V36HR-2-1&\\_cdi=6894&\\_user=5677593&\\_pii=S0022247X11004586&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=11%2F01%2F2011&\\_sk=996169998&wchp=dGLzVlz-zSkWI&md5=c9861accabf795a6433d8bbbf13733b3&ie=/sdarticle.pdf](http://www.sciencedirect.com/science?_ob=MIimg&_imagekey=B6WK2-52V36HR-2-1&_cdi=6894&_user=5677593&_pii=S0022247X11004586&_origin=browse&_zone=rslt_list_item&_coverDate=11%2F01%2F2011&_sk=996169998&wchp=dGLzVlz-zSkWI&md5=c9861accabf795a6433d8bbbf13733b3&ie=/sdarticle.pdf)>.

5 Dubickas, Artūras. The lonely runner problem for many runners // Glasnik matematički. Zagreb : Hrvatsko Matematičko Društvo. ISSN 0017-095X. 2011, vol. 46, no. 1, p. 25-30.

6 Dubickas, Artūras. Polynomials expressible by sums of monic integer irreducible polynomials // Bulletin mathématique de la Société des sciences mathématiques de Roumanie. Bucharest : Societatea de Stiinte Matematice din Romania. ISSN 1220-3874. 2011, vol. 54, no. 1, p. 65-81. Prieiga per internetą: <<http://ssmr.ro/bulletin/pdf/54-1/Dubi.pdf>>.

7 Dubickas, Artūras. On a weighted sum of distances from a well distributed set of points // Mathematical Inequalities & Applications. Zagreb : Element d.o.o. ISSN 1331-4343. 2011, vol. 14, no. 2, p. 445-453.

8 Dubickas, Artūras. On the location of roots of non-reciprocal integer polynomials // Applicable algebra in engineering communication and computing. Berlin : Springer. ISSN 0938-1279. 2011, vol. 22, no. 1, p. 1-19. Prieiga per internetą: <<http://www.springerlink.com/content/j361k32602618630/fulltext.pdf>>.

9 Račkauskas, Alfredas; Suquet, Charles. Operator fractional Brownian motion as limit of polygonal lines processes in Hilbert space // Stochastics and dynamics. Singapore: World Scientific. ISSN 0219-4937. 2011, Vol. 11, iss. 1, p. 49-70. Prieiga per internetą: <<http://www.worldscientific.com/doi/pdf/10.1142/S0219493711003152>>.

1 Manstavičius, Martynas. On the Fourier coefficients of linear fractional stable motion // Lithuanian

0 mathematical journal. New York : Springer. ISSN 0363-1672. 2011, vol. 51, no. 3, p. 402-416. Prieiga per internetą: <<http://www.springerlink.com/content/a3750583801484v7/fulltext.pdf>>.

1 Grigelionis, Bronius. On the Hougaard subordinated Gaussian Lévy processes // Statistics & probability letters. 1 Amsterdam : Elsevier BV. ISSN 0167-7152. 2011, Vol. 81, no. 8, p. 998-1002. Prieiga per internetą: <[http://www.sciencedirect.com/science?\\_ob=MiamiImageURL&\\_cid=271498&\\_user=1017010&\\_pii=S0167715211000356&\\_check=y&\\_origin=browse&\\_zone=rslt\\_list\\_item&\\_coverDate=2011-08-31&wchp=dGLzVIV-zSkWb&md5=971b97eeb0a879f88a84dc8af8433d0a/1-s2.0-S0167715211000356-main.pdf](http://www.sciencedirect.com/science?_ob=MiamiImageURL&_cid=271498&_user=1017010&_pii=S0167715211000356&_check=y&_origin=browse&_zone=rslt_list_item&_coverDate=2011-08-31&wchp=dGLzVIV-zSkWb&md5=971b97eeb0a879f88a84dc8af8433d0a/1-s2.0-S0167715211000356-main.pdf)>.

1 Grigelionis, Bronius. Extending the Thorin class // Lithuanian mathematical journal. New York : Springer. ISSN 2 0363-1672. 2011, vol. 51, no. 2, p. 194-206. Prieiga per internetą: <<http://www.springerlink.com/content/l13200321366n41r/fulltext.pdf>>.

1 Bardet, Jean Marc; Surgailis, Donatas. Measuring the roughness of random paths by increment ratios // 3 Bernoulli. Voorburg : International Statistical Institute. ISSN 1350-7265. 2011, vol. 17, no. 2, p. 749-780.

1 Mikulevičius, Remigijus; Pragarauskas, Henrikas. Model problem for integro-differential Zakai equation with 4 discontinuous observation processes // Applied mathematics and optimization. New York : Springer. ISSN .0095-4616. 2011, vol. 64, no 1, p. 37-69. Prieiga per internetą: <<http://www.springerlink.com/content/yj3w412516416481/fulltext.pdf>>.

1 Dubickas, Artūras. Roots of polynomials with dominant term // International journal of number theory. 5 Singapore : World Scientific Publishing Company. ISSN 1793-0421. 2011, vol. 7, no 5, p. 1217-1228.

1 Dubickas, Artūras. On beta-expansions of unity for rational and transcendental numbers beta // Mathematica 6 Slovaca. Warsaw : Versita. ISSN 0139-9918. 2011, vol. 61, no 5, p. 705-716. Prieiga per internetą: <<http://www.springerlink.com/content/x1520m63925361x3/fulltext.pdf>>.

#### Article(s) [indexed in Thomson Reuters Web of Science]

##### 09P - Informatics

1 Kubilius, Kęstutis; Melichov, Dmitrij. On comparison of the estimators of the Hurst index of the solutions of . stochastic differential equations driven by the fractional Brownian motion // Informatica / Matematikos ir informatikos institutas. Vilnius : Lietuvos mokslų akademijos leidykla. ISSN 0868-4952. 2011, vol. 22, no. 1, p. 97-114. Prieiga per internetą: <<http://www.mii.lt/informatica/pdf/INFO807.pdf>>.

#### Papers [indexed in databases]

##### 01P - Mathematics

1 Grigelionis, Bronius. Student's t-Distribution // International Encyclopedia of Statistical Science. Part. 19. . Heidelberg : Springer, 2011. ISBN 9783642048982. p. 1558-1559.

#### Reviewed article(s)

##### 01P - Mathematics

1 Dubickas, Artūras. Divisibility of the Resultant of a Polynomial and a Cyclotomic Polynomial // Moscow . Journal of Combinatorics and Number Theory. Moscow : Moscow Institute of Physics and Technology. ISSN 2220-5438. 2011, vol. 1, iss. 1, p. 11-16.

2 Dubickas, Artūras. An extended lemma of Dobrowolski and Smyth's congruence // Acta scientiarum . mathematicarum. Szeged : Bolyai Institute. ISSN 0001-6969. 2011, vol. 77, no 3-4, p. 403-408.

#### Conference theses

##### 01P - Mathematics

1 Drungilas, Paulius; Akiyama, Shigeki; Jankauskas, Jonas; Dubickas, Artūras. Aukščio mažinimas skaičiavimo . sistemoje // Fizinių ir technologijos mokslų tarpdalykiniai tyrimai : pirmosios LMA Jaunųjų mokslininkų konferencijos pranešimų santrauka, Vilnius, 2011.02.08 [elektroninis išteklius]. Vilnius : LMA leidykla, 2011. Prieiga per internetą: <<http://lma.lt/media/k2/attachments/SANTRAUKOS.pdf>>.

2 Jankauskas, Jonas; Dubickas, Artūras. On the intersection of in nite geometric and arithmetic progressions // . 27th Journées Arithmétiques, June 27 - July 1, 2011, Vilnius, Lithuania : programme and abstract book. Vilnius : Vilniaus universitetas, 2011. p. 29. Prieiga per internetą: <<http://atlas-conferences.com/cgi-bin/abstract/cbbv-46>>.

3 Šarka, Paulius; Dubickas, Artūras. Sumsets of sparse sets // 27th Journées Arithmétiques, June 27 - July 1, . 2011, Vilnius, Lithuania : programme and abstract book. Vilnius : Vilniaus universitetas, 2011. p. 59. Prieiga per internetą: <<http://atlas-conferences.com/cgi-bin/abstract/cbbv-51>>.

4 Šemetulskis, Gražvydas; Dubickas, Artūras. On polynomials with at squares // 27th Journées Arithmétiques, . June 27 - July 1, 2011, Vilnius, Lithuania : programme and abstract book. Vilnius : Vilniaus universitetas, 2011. p. 60. Prieiga per internetą: <<http://atlas-conferences.com/cgi-bin/abstract/cbbv-49>>.

5 Račkauskas, Alfredas; Suquet, Charles. Multivariate models with space varying memory // The 9th Tartu



. Conference on Multivariate Statistics and the 20th International Workshop on Matrices and Statistics, 26 June - 1 July 2011, Tartu, Estonia : abstracts. Tartu : Tartu Ülikool, 2011. p. 66.

6 Račkauskas, Alfredas. Linear processes with space varying memory // CFE 2011 : Computational and financial . econometrics : 5th CSDA international conference, 17-19 December, 2011, London, UK : programme and abstracts. London : University of London, 2011. p. 57.

#### **Part(s) of book(s)**

##### **01P - Mathematics**

1 Kvedaras, Virmantas; Račkauskas, Alfredas; Zuokas, Danas. Regression models of macroeconomic indicators . with explanatory variables observed at a higher frequency // Financial markets: principles of modelling, forecasting and decision-making / ed. by Władysław Milo, Grzegorz Szafranski, Piotr Wdowiński. - (FindEcon monograph series: Advances in financial market analysis; No. 9). Łódź: Łódź University Press, 2011. ISBN 9788375255614. p. 87-100.

2 Grigelionis, Bronius; Mikulevičius, R.. Nonlinear filtering equations for stochastic processes with jumps // The . Oxford Handbook of Nonlinear Filtering / edited by Dan Crisan, Boris Rozovskii. Oxford : Oxford University Press, 2011. ISBN 9780199532902. p. 95-128.

### **COOPERATION**

- Massachusetts Institute of Technology (USA)
- Michigan State University (USA)
- Université Paris 1 Sorbonne (France)
- Université de Nantes (France)
- Université de Cergy (France)
- London University (United Kingdom)
- Vilniaus Gedimino Technikos Universitetas

### **OTHER SCIENTIFIC ACTIVITIES**

#### **A. Dubickas –**

- Chairman of the local organizing committee of the international number theory conference 27th Journées Arithmétiques

<http://www.ja2011.lt/>

- Member of the editorial board of "Uniform Distribution Theory"
- Member of the editorial board of "Central European Journal of Mathematics"
- Member of the editorial board of the "Lithuanian Mathematical Journal"
- Member of the editorial board of "Šiauliai Mathematical Seminar"

#### **B. Grigelionis –**

- Member of Editorial Boards of the Lithuanian Mathematical Journal and Nonlinear Analysis: Modeling and Control.

#### **R. Norvaiša –**

- Associate editor of the *Lithuanian Mathematical Journal*
- Invited speaker of the conference on stochastic processes and applications in Debrecen, Hungary 2011 August 22-25.

#### **R. Leipus –**

- Associate editor of the *Lithuanian Mathematical Journal*

#### **D. Surgailis –**

- Associate editor of the *Lithuanian Mathematical Journal*.
- Visited Michigan State University in April, 2011 and gave three talks at the Probability seminar and the Statistics Colloquium of MSU.

- Invited speaker of the 33rd Finnish Summer School on Probability Theory and Statistics, June 6—10, 2011, Päivölän Kansanopisto, Finland, gave a course „Modeling and Estimation of Stationary and Nonstationary Long Memory“ (6 lectures).

**K. Kubilius –**

- Executive editor of the *Lithuanian Mathematical Journal*
- Member of the editorial board of *Mathematical Modelling and Analysis*
- Member of the editorial board of *Proceedings of Institute of Mathematics* (Latvia)