

Alexandr Savinov

Curriculum Vitae

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1 Personal Data

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Birth date: 13.01.1966

Citizenship: Germany



2 Professional Career

December 2009 – Present: [SAP Research](#), [Business Intelligence Practice](#), Data Management & Analytics Team, Dresden, Germany
- Researcher (2009)

July 2006 – June 2009: University of Bonn, [Institute of Computer Science III](#), Bonn, Germany:
- Researcher (2006)

April 1999 – July 2006: [Fraunhofer Institute for Intelligent Analysis and Information Systems \(IAIS\)](#), [Knowledge Discovery Team](#), Sankt-Augustin, Germany:
- Senior Researcher (2005) - Researcher (2001) - Post-doc (1999)

August 1989 – March 1999: [Institute of Mathematics and Computer Science](#), Academy of Sciences of Moldova, Laboratory of Artificial Intelligence Systems, [Kishinev](#), Moldova:
- Senior Researcher (1998) - Researcher (1992) - Junior Researcher (1991) - Software Engineer (1989)

3 Education

Ph.D., November 1993, Computer Science, [Technical University of Moldova](#), Kishinev, Moldova.
Thesis: “*Matrix Representation of Fuzzy Knowledge in Expert Systems*”.

Post graduated, March 1994: Laboratory of Artificial Intelligence Systems, [Institute of Mathematics and Computer Science](#), Academy of Sciences of Moldova, [Kishinev](#), Moldova.
Specialization: *Artificial intelligence, Machine learning, Expert systems, Fuzzy systems*

MS, June 1989: [Moscow Institute of Physics and Technology](#) - MIPT (State University), Dept. of Aerophysics and Space Research. Specialization: Physics, Mathematics, Electrical Engineering, Computer Science, Artificial intelligence, Machine learning. Thesis supervisor: Prof. D.A. Pospelov

4 Public Funded Projects

[2011–2015] [LinkedDesign](#): Linked Knowledge in Manufacturing, Engineering and Design for Next-Generation Production, EU Project

[2010–2012] [MIRABEL](#) – Micro-Request-Based Aggregation, Forecasting and Scheduling of Energy Demand, Supply and Distribution, EU Project

[2006–2009] [GLOWA-Volta](#) – Sustainable Water Use under Changing Land Use, Rainfall Reliability, and Water Demands in the Volta Basin, BMBF Project

[2006–2006] [ITSimBw](#) – Military Multi-Agent Simulation Environment (IT Amt Bundeswehr)

[2004–2006] [DataMiningGrid](#) – Data Mining Tools and Services for Grid Computing Environments, 06/2004-06/2006, EU Project

[1999–2003] [SPIN!](#) – Spatial Mining for Data of Public Interest, 01/2000-06/2003, EU Project

[MiningMart](#) – Enabling End-User Datawarehouse Mining, 01/2000-03/2003, EU Project

[KogiPlan](#) – Decision Support for Location and Facility Planning, 2000-2003, BMBF, Germany

5 Research Interests

Data: Data modeling, Databases, Database architectures, Data analysis, Data mining, Data warehouses and OLAP, Data semantics, Spatial data management

Knowledge: Knowledge representation, Ontology engineering, Artificial intelligence, Expert systems and DSS, Fuzzy systems, Machine learning, Text mining and search techniques, Spatial data analysis

Computing: Grid/cloud computing, Distributed computing, Programming paradigms, Programming languages, P2P systems, Web services, Service-oriented architecture

Visualization: Visual analytics, Geographic information systems

6 Research Results

[2003-Present] Data modeling and programming paradigms

- A novel data model has been developed, [concept-oriented model](#) (COM) [2,4,6,7]:
 - COM is based on partial order relation for describing data semantics
 - nested partially ordered sets is a formal basis for the model
 - concept-oriented query (COQL) language has been developed
- A novel approach to programming has been developed, [concept-oriented programming](#) (COP) [3,5]:
 - generalization of classes and inheritance is proposed, called [concept](#) and [inclusion](#), respectively
 - COP generalizes OOP and is an alternative to AOP

[2006-2009] Grid/cloud computing, Semantic annotations, Semantic web

- Semantic annotations, ontologies, distributed workflow execution
- Evaluation, adaptation and use of the following systems: Globus toolkit, Unicore 5.x/6.x, GRIA 5.x. Gridifying existing applications for these systems.

[1999-2006] Data mining, Knowledge discovery in databases, Rule induction

- A novel approach to (dependence) rule induction was developed (Quota) [10,11]:
 - itemset interestingness is defined as a difference between real probability and expected probability (computed by means of iterative proportional fitting algorithm)
 - an efficient method for finding upper bound for this measure of interestingness was proposed (support quota) which allows us to avoid exhaustive search in the space of all itemsets
- A novel approach to fuzzy rule induction was developed [14,15,16]:
 - rules are generated from what is known to be impossible (holes in data)
 - an efficient algorithm has been proposed based on sectioned matrixes
- Data mining system [SPIN!](#) Was designed and developed [8,9,12]:
 - SPIN! has a plug-in architecture (implemented in Java) so that new components can be easily added
 - SPIN! can use EJBs for running (data mining) algorithms (EJB, JBoss)
- A number of algorithms for spatial data mining and visualization were developed [13]:
 - SQL-based server-side algorithm for spatial data analysis (Oracle spatial, Java)
 - Coupling between SPIN! and CommonGIS geographic information system for spatial data mining (C4.5 tree induction).
- An experimental system for intelligent analysis of financial time series Activist:
 - Preprocessor for retrieving data and generating new variables from their definition (Java)
 - Analyzer for computing dependencies from multivariate time-series (C++)
 - Postprocessor for carrying out inference and generating signals (Java)
 - Module for retrieving news feeds/forums and finding dependencies with stock indexes using SVM algorithm
- Experimental search engine developed and implemented [COMBIS](#):
 - The focus is on finding interesting combinations of words rather than individual word occurrences
 - Simple web interface (JSP, JBoss) and access to Google Search API

[1989-1999] Artificial intelligence, Expert systems, Fuzzy knowledge representation and inference

- A novel approach to fuzzy knowledge representation and inference with the following properties [17,18,19]:
 - it is analogous to classical CNF and DNF
 - using sectioned matrixes makes computations much more efficient
 - it uses a novel operation of [fuzzy resolution](#)
- This formal approach was implemented in several versions of the expert system shell [EDIP](#) (DOS, Windows 3.x, Windows API, C/C++, Assembly language)
- Several diagnostic expert systems in medicine, ecology and biology were created in EDIP

7 Community Activity

Program Committee member:

- Data Mining Track, 21th ACM Symposium on Applied Computing (ACM SAC'06), Dijon, France, April 23-27, 2006.
- Data Mining Track, 20th ACM Symposium on Applied Computing (ACM SAC'05), Santa Fe, New Mexico, USA, March 13-17, 2005.

External reviewer:

- Journal of Data and Knowledge Engineering (2005)
- 8th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD'04), Pisa, Italy, September 20-24, 2004.
- 7th International Conference on Discovery Science (DS'04), University of Padova, Padova, Italy, October 2-5, 2004.
- Computer Science Journal of Moldova

Online activity:

- Concept-oriented blog: <http://conceptoriented.org/blogs/cob/>
- The Concept-Oriented Portal: <http://conceptoriented.org/>
- Wikipedia article: http://en.wikipedia.org/wiki/Concept-oriented_model
- c2 wiki article: <http://www.c2.com/cgi/wiki?ConceptOrientedModel>

8 Skills

Databases: HANA (SAP newest in-memory database), Oracle, MySQL, PostgreSQL

Middleware: JBoss, WebSphere, Orion (Oracle AS), Hibernate

Language technologies: Antlr (for defining grammar of new languages), Javacc

Programming languages: Java, C++, C, C#, Python, Visual Basic, AspectJ, Assembly, JavaScript

Grid computing: Globus Toolkit, Unicore 5.x/6.x, GRIA, Condor

Geographic information systems: CommonGIS, Oracle Spatial, Spatial data analysis

Networking: UDP (layer for real time multi-agent system [ITSimBw](#), Java/C++), TCP/IP

Operating Systems: Windows, Linux, DOS

Technologies and Standards: Web Services and SOA (SOAP, WSDL), XML (DOM, SAX, DTD, XmlSchema, Xerces), J2EE (EJB, RMI, JDBC, JNDI), Semantic Web (RDF, OWL)

Development Tools: Eclipse, IntelliJ IDEA, JBuilder, Visual Studio, Version management (SVN, Git), Build tools (make, ant, maven), Issue management (JIRA, Trac, Scarab)

Natural Languages: English, German, Russian

9 Selected Publications

More than 70 publications (full list in [PDF](#)).

- [1] Savinov, A. Concept-Oriented Model: Extending Objects with Identity, Hierarchies and Semantics. Computer Science Journal of Moldova (CSJM), 19(3), 2011.
- [2] Savinov, A. Concept-Oriented Query Language for Data Modeling and Analysis. *Advanced Database Query Systems: Techniques, Applications and Technologies*, L. Yan, Z. Ma (Eds), IGI Global, 2011, 85-101
- [3] Savinov, A. A. Savinov, Concept-Oriented Programming, *Encyclopedia of Information Science and Technology*, 2nd Edition, Editor: Mehdi Khosrow-Pour, IGI Global, 2009, 672-680
- [4] Savinov, A. Concept-Oriented Model, *Handbook of Research on Innovations in Database Technologies and Applications: Current and Future Trends*, Editors: Viviana E. Ferragine, Jorge H. Doorn, Laura C. Rivero, IGI Global, 2009, 171-180
- [5] Savinov, A. [Concepts and Concept-Oriented Programming](#). Journal of Object Technology, 7(3), March-April 2008, pp. 91–106, 2008. ([PDF](#))
- [6] Savinov, A. [Grouping and Aggregation in the Concept-Oriented Data Model](#). Proc. ACM Symposium on Applied Computing (SAC'06), 482–486, 2006. ([PDF](#))
- [7] Savinov, A. Hierarchical Multidimensional Modelling in the Concept-Oriented Data Model, 3rd Intl. Conference on Concept Lattices and Their Applications (CLA'05), Olomouc, Czech Republic, 123–134, 2005. ([PDF](#))

- [8] May M., Savinov A. SPIN! — an Enterprise Architecture for Data Mining and Visual Analysis of Spatial Data, In: *Visual and Spatial Analysis: Advances in Data Mining, Reasoning and Problem Solving*, B. Kovalerchuk, J. Schwing (eds.), Kluwer, 293–317, 2004.
- [9] Savinov, A. SPIN! Data Mining System Based on Component Architecture, Proc. 8th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD'04) Pisa, Italy, September 20–24, 2004, 555–557. ([PDF](#))
- [10] Savinov A. Mining Dependence Rules by Finding Largest Itemset Support Quota. ACM Symposium on Applied Computing (SAC 2004), March 14–17, 2004, Nicosia, Cyprus, 525–529. ([PDF](#))
- [11] Savinov A. Mining Spatial Rules by Finding Empty Intervals in Data, Proc. of the 7th International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES'03), 3–5 September 2003, Oxford, UK, 1058–1063. ([PDF](#))
- [12] May M., Savinov A. SPIN! — an Enterprise Architecture for Spatial Data Mining. Proc. of the 7th International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES'03), 3–5 September 2003, Oxford, UK, 510–517. ([PDF](#))
- [13] Andrienko N., Andrienko G., Savinov A., Voss H., Wettschereck D. Exploratory Analysis of Spatial Data Using Interactive Maps and Data Mining. *Cartography and Geographic Information Science* **28**(3), July 2001, 151–165
- [14] Savinov A. Mining Interesting Possibilistic Set-Valued Rules. In: *Fuzzy If-Then Rules in Computational Intelligence: Theory and Applications*, Da Ruan and Etienne E. Kerre, eds. Kluwer, 2000, 107–133. ([PS](#))
- [15] Savinov A. An algorithm for induction of possibilistic set-valued rules by finding prime disjunctions. In: *Soft computing in industrial applications*, Suzuki, Y., Ovaska, S.J., Furuhashi, T., Roy, R., Dote, Y., eds. Springer-Verlag, London, 2000. ([PDF](#))
- [16] Savinov A. Mining possibilistic set-valued rules by generating prime disjunctions. Proc. 3rd European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD'99), Prague, Czech Republic, September 15–18, 1999, 536–541. ([PDF](#))
- [17] Savinov A. Application of multi-dimensional fuzzy analysis to decision making. In: *Advances in Soft Computing — Engineering Design and Manufacturing*, R. Roy, T. Furuhashi and P.K. Chawdhry, eds. Springer-Verlag, London, 1999, 301–314. ([PDF](#))
- [18] Savinov A. Some Properties of New Resolution Rule in the Logic of Possibility Distributions. 4th Eur. Congr. on Intelligent Techniques and Soft Computing (EUFIT'96), Aachen, Germany, September 2–5, 178–182, 1996
- [19] Savinov A. Fuzzy propositional logic. *Fuzzy Sets and Systems* **60**(1), 9–17, 1993