

## Curriculum Vitae

Dr Vitaly Schetinin  
Department of Computing and Information Systems  
University of Bedfordshire  
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### Education:

1997. PhD in Computer Science (Machine Learning & Applied Statistics), Study on Group Method of Data Handling and GMDH-Type Neural Networks. University of Penza, Russia
- 1974–1979. Diploma of Engineer in Electronics and Computing, University of Penza

### Research Interests and Expertise:

- Artificial Intelligence, Machine Learning
- Applied Statistics, Bayesian Classification, Markov Chain Monte Carlo
- Risk and Uncertainty Estimation
- Neural Networks, Pattern Recognition, Signal/Image Processing

### Professional Activity:

- Since September 2005. Lecturer in Artificial Intelligence. Department of Computing and Information Systems, University of Bedfordshire
- 2002–2005. Research Fellow. Bayesian methodology of classification and risk estimation using Markov Chain Monte Carlo. School of Engineering, Computer Science and Mathematics, University of Exeter
- 2000–2002. Research Fellow. Methods of Machine Learning for classifying clinical electroencephalograms. University of Jena, Germany
- 1997–2000. Docent (Reader) in Applied Statistics, Optimisation, and Artificial Intelligence. Department of Natural Sciences, University of Penza
- 1992–1997. Head of Unit. Development of software for medical statistics and clinical diagnostics. Penza Bureau of Medical Statistics, Penza
- 1989–1992. Senior Scientist. Development of methods and techniques for analysing medical data, evaluating and minimising credit risk. Penza's innovation firms
- 1980–1989. Scientist, Senior Scientist. Methods and techniques for statistical analysis of machinery production and adaptive signal processing. Department of Information Systems, University of Penza.

### Programming Skills:

- MATLAB (Neural Networks, Statistics, Signal and Image Processing)
- C/C++, SQL

### Research Fellowships and Grants:

- 2002–2005. The EPSRC funding postdoctoral fellowship on the Bayesian classification for safety-critical systems. University of Exeter

2000–2002. German Scientific Founding postdoctoral fellowship on classification of clinical electroencephalograms. University of Jena

2001 October. NATO Scientific Program of Travel Grants, International School on Neural Networks. University of Milan, Italy

1998–2000. Professorship Grant in Machine Learning. University of Penza

#### **Industrial Projects:**

1991–1992. A Monte Carlo technique for optimising credit portfolio. A neural-network technique for scoring credit risks. Penza Regional Bank

1990–2000. Neural-network techniques for medical diagnostics and mining public health data. Penza Department of Public Health

#### **Professional Competition:**

- In the KDD Cup 2001 World Competition on Knowledge Discovery in Data, my solution for learning predicting models from the large-scale pharmacological data was ranked 8<sup>th</sup> from 114

#### **Other Professional Activities:**

- A Member of the IEEE Computational Intelligence Society
- Reviewing research papers for:
  - o IEEE Intelligent Systems, IEEE Transactions on: Evolutionary Computing, Neural Networks, and Industrial Electronics, Elsevier: Signal Processing, Fussy Sets and Systems
  - o Int. Conf. KES-04, IDEAS-04, KES-05, MICAI-07, and KES-06

#### **Teaching Activities:**

Since 2005. Lectures and practical for UG students:

- 1) Concepts of Artificial Intelligence (1/2)
- 2) Intelligent Techniques (1/2)
- 3) Decision Support Systems (1/3)
- 4) Computational Robotics (1/2)

Lectures and practical for PG students:

- 1) Intelligence Agents (1/2)
- 2) Data Mining and Data Warehouse (1/6)

Supervising UG and PG projects.

Consulting industrial projects.

Reviewing PhD projects.

1997-2000. Lectures and practical for UG students:

- 1) Statistics
- 2) Operational Research

Lectures and practical for PG students:

- 1) Theory of Optimal Decisions
- 2) Information Technologies

Supervising PG and PhD projects.

#### **Supervised PhD Projects:**

- 1998. Predicting the Post-Operative Complications in Surgery with Knowledge-Based Artificial Neural Networks

- 1999. Testing the Quality of Industrial Products with GMDH-Type Neural Networks

## MAIN PUBLICATIONS

### Book Chapters:

1. Schetinin V., Fieldsend J.E., Partridge D., Krzanowski W.J., Everson R.M., Bailey T.C., Hernandez A. Estimating Classification Uncertainty of Bayesian Decision Tree Technique on Financial Data. In: *Perceptual Data Mining and Decision Making in Economics and Finance. Studies in Computational Intelligence*. ISBN 3-540-36244-4. Vol. 36. Eds: I. Batyrshin, J. Kacprzyk, L. Sheremetov, L.A. Zadeh. Springer, 155-179, 2007.
2. Schetinin V., Zharkova V. Neural Networks for Recognizing Patterns in Solar Images. In: *Artificial Intelligence in Recognition and Classification of Astrophysical and Medical Images*. ISBN: 978-3-540-47511-8. Eds: V. Zharkova, and L.C. Jain. Springer, 151-159, 2007.
3. Schetinin V., Zharkova V. Machine Learning Methods for Pattern Recognition in Solar Images. In: *Artificial Intelligence in Recognition and Classification of Astrophysical and Medical Images*. ISBN: 978-3-540-47511-8. Eds: V. Zharkova, and L.C. Jain. Springer, 160-168, 2007.
4. Schetinin V., Zharkova V. A Bayesian Methodology of Averaging over Decision Trees for Solar Data Classification. In: *Artificial Intelligence in Recognition and Classification of Astrophysical and Medical Images*. ISBN: 978-3-540-47511-8. Eds: V. Zharkova, and L.C. Jain. Springer, 169-199, 2007.
5. Schetinin V., Fieldsend J.E., Partridge D., Krzanowski W.J., Everson R.M., Bailey T.C., Hernandez A. A Bayesian Methodology for Estimating Uncertainty of Decisions in Safety-Critical Systems. In: *Integrated Intelligent Systems for Engineering Design. Frontiers in Artificial Intelligence and Applications*. ISBN 1-58603-675-0. Vol. 149. Eds: X.F. Zha, and H.J. Howlett. IOS Press, 82-96, 2006.
6. Schetinin V., Schult J., Brazhnikov A. Neural-Network Technique for Visual Data Mining Clinical Electroencephalograms. In: *Visual and Spatial Decision Making and Problem Solving*. ISBN 1-4020-2939-X. Eds: B. Kovalerchuk, and J Schwing, Springer, 335-370, 2005.

### Journal Papers:

1. Schetinin V., Fieldsend J.E., Partridge D., Coats T., Krzanowski W.J., Everson R.M., Bailey T.C., Hernandez A. Confident Interpretation of Bayesian Decision Trees for Clinical Applications. *IEEE Transaction on IT in Biomedicine*, 11:3, 312-319, 2007.
2. Krzanowski W., Fieldsend J.E., Bailey T.C., Everson R.M., Partridge D., Schetinin V. Confidence in Classification: a Bayesian Approach. *Journal of Classification*, Springer, 23:2, 199-220, 2006.
3. Bailey T.C., Everson R.M., Fieldsend J.E., Krzanowski W.J., Partridge D., Schetinin V. Representing Classifier Confidence in the Safety Critical Domain - an Illustration from Mortality Prediction in Trauma Cases. *Neural Computing & Applications*, Springer, 16:1, 1-10, 2006.
4. Schetinin V., Fieldsend J.E., Partridge D., Krzanowski W.J., Everson R.M., Bailey T.C., Hernandez A. Comparison of the Bayesian and Randomised Decision Tree

- Ensembles within an Uncertainty Envelope Technique. *Journal of Mathematical Modelling and Algorithms*, Springer, 5:4, 397-416, 2006.
5. Zharkova V.V., Schetinin V. Filament Recognition in Solar Images with the Artificial Neural Network. *Solar Physics*, Springer, 228:1-2, 137-148, 2005.
  6. Schetinin V., Schult J. Learning Polynomial Networks for Classification of Clinical Electroencephalograms. *Soft Computing*, Springer, 10: 4, 397-403, 2005.
  7. Schetinin V., Abrukov V., Brazhnikov A. Self-Organising Neural-Network Models for Mining Underrepresented Data. *Automatic Control and Computer Science*, Allerton Press, 39:2, 15-23, 2005.
  8. Schetinin V., Schult J. A Neural-Network Technique for Learning Concepts from Electroencephalograms. *Theory in Biosciences*, Elsevier, 124, 41-53, 2005.
  9. Schetinin V. An Evolving Cascade Neural-Network Technique for Cleaning Sleep Electroencephalograms. *Neural Computing & Applications*, Springer, 2005 (in press).
  10. Schetinin V., Schult J. The Combined Technique for Detection of Artefacts in Clinical Electroencephalograms of Sleeping Newborns. *IEEE Transaction on Information Technologies in Biomedicine*, 8:1, 28-35, 2004.
  11. Schetinin V. A Learning Algorithm for Evolving Cascade Neural Networks. *Neural Processing Letters*, Kluwer, 17: 1, 21-31, 2003.
  12. Schetinin V. Pattern Recognition with Neural Network. *Optoelectronics, Instrumentation and Data Processing*, Allerton Press, 2, 75-80, 2000.
  13. Schetinin V., Brazhnikov A. Extracting Decision Rules Using Neural Networks. *Biomedical Engineering*, Kluwer, 1, 16-21, 2000.
  14. Schetinin V., Solomakha A. Prediction of Postoperative Complications with Neural Networks. *Biomedical Engineering*, Kluwer, 2, 21-24, 2000.
  15. Schetinin V. Self-Organizing Multilayered Neural Networks of Optimal Complexity. *Automatic Control and Computer Science*, Allerton Press, 4, 30-38, 1998.
  16. Schetinin V. Reducing to Explicit Form Polynomial Network Specified Degree Synthesised with GMDH Algorithms. *Automation and Information Science*, Begell House, 3-4, 1995.

#### Conference Papers:

1. Schetinin V., Maple C. A Bayesian Model Averaging Methodology for Detecting EEG Artefacts. 15th International Conference on Digital Signal Processing, DSP-2007, Sponsored by the IEEE, Cardiff, 2007 (in press).
2. Schetinin V., Krzanowski W.J, Maple C. The Bayesian Decision Tree Technique Using an Adaptive Sampling Scheme. The 20th IEEE International Symposium on Computer-Based Medical Systems, CBMS-2007, Maribor, 121-126, 2007.
3. Maple C., Schetinin V. A Bayesian Model Averaging Methodology for Estimating Reliability of Decisions in Multimodal Biometrics. IEEE Conference on Data Warehousing and Mining Applications, DAWAM-2006, Vienna. IEEE Computer Society, 929-935, 2006.
4. Schetinin V., Zharkova V., Zharkov S. Bayesian Decision Tree Averaging for the Probabilistic Interpretation of Solar Flare Occurrences. B. Gabrys, R.J. Howlett, and L.C. Jain (Eds.), *Lecture Notes in Artificial Intelligence*, LNAI, 4253, Springer, 523-532, 2006.

5. Partridge D., Schetinin V., Li D., Coats T., Fieldsend J.E., Krzanowski W.J., Everson R.M., Bailey T.C. Interpretability of Bayesian Decision Trees Induced from Trauma Data. *Lecture Notes in Artificial Intelligence*, LNAI, 4029, Springer, 972-981, 2006.
6. Partridge D., Bailey T., Everson , Fieldsend J., Hernandez A., Krzanowski W., Schetinin V. Classification with Confidence for Critical Systems. *Developments in Risk-based Approaches to Safety. Proceedings of the 14 Safety-Critical Systems Symposium*, Bristol, UK, 231-240. 2006.
7. Schetinin V., Fieldsend J.E., Partridge D., Krzanowski W.J., Everson R.M., Bailey T.C., Hernandez A. The Bayesian Decision Tree Technique with a Sweeping Strategy. *IEEE Conference on Advances in Intelligent Systems - Theory and Applications*. Luxembourg, 2004.
8. Schetinin V., Partridge D., Krzanowski W.J., Everson R.M., Fieldsend J.E., Bailey T.C., Hernandez A. Experimental Comparison of Classification Uncertainty for Randomised and Bayesian Decision Tree Ensembles. *Intelligent Data Engineering and Automated Learning. Lecture Notes in Computer Science*, Springer, LNCS, 3177, 726-732, 2004.
17. Zharkov S. I., Schetinin V., Zharkova V. V., The Automatic Classification with ANN of sunspot groups using the Solar Feature Catalogue. *COSPAR-2004*.
18. Schetinin V., Schult J., Scheidt B., Kuriakin V. Learning Multiclass Neural-Network Models from Electroencephalograms. *Knowledge-Based Intelligent Information and Engineering Systems. Lecture Notes in Computer Science*, LNCS, 2773, Springer, 155-162, 2003.
19. Zharkova V.V., Schetinin V. A Neural-Network Technique for Recognition of Filaments in Solar Images. *Lecture Notes in Computer Science*, LNCS, 2773, Springer, 148-154, 2003.
20. Abrukov V., Schetinin V., Deltsov P. Using Artificial Neural Networks for Combustion Interferometry. *Lecture Notes in Computer Science*, LNCS 2773, Springer, 684-690, 2003.
21. Fieldsend J., Bailey T.C., Everson R.M., Krzanowski W.J., Partridge D., Schetinin V. Bayesian Inductively Learned Modules for Safety Critical Systems. *Computing Science and Statistics*, Interface Foundation, 2003.
22. Zharkova V.V., Schetinin V. Recognition of Filaments in Solar Images with an Artificial Neural Network, *ESANN-2004*, ISBN: 2-930307-03-X, Bruges, 521-526, 2003.
23. Schetinin V. A Neural-Network Decision Tree for Learning Concepts from EEG Data. *NIMIA-SC2001 NATO Advanced Study Institute on Neural Networks*, IEEE Sponsored, Italy, 147-154, 2001.
24. Schetinin V. Polynomial Neural Networks for Classifying EEG Signals. *NIMIA-SC2001*, IEEE Sponsored, Italy, 155-162, 2001.
25. Schetinin V., Kostunin A. Self-Organization of Neuron Collectives of Optimal Complexity. *Int. Conference on Nonlinear Theory and Its Applications*, NOLTA-96. Japan, 245-248, 1996.