

# Research Publications

## Selected Publications

### Books

- A. Gammerman, (ed.) Probabilistic Reasoning and Bayesian Belief Networks. Alfred Waller, Henley-on-Thames, 1995.
- A. Gammerman, (ed.) Computational Learning and Probabilistic Reasoning. John Wiley & Sons, Chichester, 1996.
- A. Gammerman. Machine Learning: Progress and Prospects. ISBN 0 900145 93 5, 1997.
- A. Gammerman, (ed.) Causal Models and Intelligent Data Management. Springer-Verlag, 1999.
- V.Vovk, A.Gammerman and G.Shafer. Algorithmic learning in a random world. New York: Springer, 2005.
- A.Gammerman, (ed.) Artificial Intelligence and Applications, Proceedings of the Conference, ACTA Press, ISBN: 978-0-88986-709-3, 2008.

### Special Issues of Journals

- A.Gammerman and V.Vovk (editors). Special Issue on Kolmogorov Complexity. *The Computer Journal*, vol. 42, no. 4, pp.254-347, (1999).
- C. Aitken, T. Connolly, A. Gammerman, G. Zhang, D. Oldfield. Predicting an Offender's Characteristics: an evaluation of statistical modelling. *Special Interest Series - Paper 4*, Home Office, London, 1995.

### Refereed Book Chapters, Journal Papers, Conference Proceedings

- On-line predictive linear regression. *Annals of Statistics*, Volume 37, Number 3 (2009), 1566-1590 (with V.Vovk and I.Nourtdinov). Permanent link to this document: <http://projecteuclid.org/euclid.aos/1239369032> Digital Object Identifier: doi:10.1214/08-AOS622.

- Confidence Machine and its application to Medical Diagnosis. Int.Conf.on Biological Computing (BioComp09) (with D.Devetyarov and I.Nouretdinov). July 2009, USA.
- Proteomics analysis of ovarian cancer serum samples (Part 1): Peptides generated ex vivo from abundant serum proteins by tumour-specific exopeptidases are not useful biomarkers in ovarian cancer. (with Ali Tiss, Celia Smith, Dmitry Devetyarov, Aleksandra Gentry-Maharaj, Stephane Camuzeaux, Brian Burford, Ilia Nouretdinov, Jeremy Ford, Zhiyuan Luo, John F. Timms, Ian Jacobs, Usha Menon and Rainer Cramer). Submitted to Clinical Chemistry.
- Proteomics analysis of ovarian cancer serum samples (Part 2): Serum MALDI-TOF MS profiling and CA125 immunoassay as diagnostic tools. (with John F. Timms<sup>1</sup>, Rainer Cramer, Stephane Camuzeaux, Ali Tiss, Celia Smith, Brian Burford, Ilia Nouretdinov, Musarat Kabir, Aleksandra Gentry-Maharaj, Jeremy Ford, Zhiyuan Luo, Usha Menon<sup>1</sup> and Ian Jacobs). Submitted to Clinical Chemistry.
- Online Prediction of Ovarian Cancer (with Fedor Zhdanov, Vladimir Vovk, Brian Burford, Dmitry Devetyarov, Ilia Nouretdinov). . Lecture Notes in Computer Science Volume 5651/2009 Artificial Intelligence in Medicine DOI 10.1007/978-3-642-02976-9; 2009.
- Cancer informatics by prototype networks in mass spectrometry. Artificial Intelligence in Medicine 45(2-3): 215-228, 2009, (with F- M. Schleif, T. Willmann, M. Kostrzewa, B. Hammer).
- Confidence Predictions for the Diagnosis of Acute Abdominal Pain. In L. Iliadis, I. Vlahavas and M. Bramer (Eds.), Artificial Intelligence Applications & Innovations III, Volume 296 of IFIP International Federation for Information Processing, 175 - 184. Springer, 2009 (with H.Papadopoulos and V.Vovk).
- Serum proteomic abnormality predating screen detection of ovarian cancer (with V.Vovk, B.Burford, I.Nouretdinov, Z.Luo, A.Chervonenkis, M.Waterfield, R.Cramer, P.Tempst, J.Villanueva, M.Kabir, S.Camuzeaux, J.Timms, U.Menon and I.Jacobs). The Computer Journal Advance Access first published online on April 4, 2008 This version published online on April 9, 2008. The Computer Journal, doi:10.1093/comjnl/bxn021
- Clinical Mass Spectrometry Proteomic Diagnosis by Conformal Predictors. Accepted for publication in Statistical Applications in Genetics and Molecular Biology Journal, Volume 7, Issue 2 2008 Article 13, 2008, (with Ilia Nouretdinov, Brian Burford Alexey Chervonenkis, Vladimir Vovk and Zhiyuan Luo).
- Predicting clinical outcome in patients diagnosed with synchronous ovarian and endometrial cancer. Ramus SJ, Elmasry K, Luo Z, Gammerman

A, Lu K, Ayhan A, Singh N, McCluggage WG, Jacobs IJ, Whittaker JC, and Gayther SA Clinical cancer research : an official journal of the American Association for Cancer Research 14(18):5840-8, 2008 Sep 15

- Adaptive Coding and Prediction of Sources with Large and Infinite Alphabets, *IEEE Transaction on Information Theory*, v.54, No.8, pp.3808–3813, August 2008 (with B.Ryabko and J.Astola).
- The Kernel Aggregating Algorithm for Regression. Submitted to *Machine Learning journal* (with S.Busutill, Y.Kalnishkan and V.Vovk)
- Normalized Nonconformity Measures for Regression Conformal Prediction. *Artificial Intelligence and Applications - AIA 2008 Conference*, Innsbruck, Austria, pp.64-69, 2008. (with H. Papadopoulos and V. Vovk).
- H. Papadopoulos, V. Vovk and A. Gammerman. Regression Conformal Prediction with Nearest Neighbours. Submitted to the *Journal of Artificial Intelligence Research*.
- A. Lambrou, H. Papadopoulos and A. Gammerman. Evolutionary Conformal Prediction for Breast Cancer Diagnosis. Submitted to the 9th International Conference on Information Technology and Applications in Biomedicine (ITAB'09).
- Hedging Predictions in Machine Learning. *The Computer Journal*, v.50, No.2, 151-163, March 2007 (with V.Vovk). The same journal also published:
  - i) Discussion on Hedging Predictions in Machine Learning by A. Gammerman and V. Vovk. *The Computer Journal*, 2007, 50: 164-172;
  - ii) Rejoinder Hedging Predictions in Machine Learning. *The Computer Journal*, 2007, 50: 173-177.
- H. Papadopoulos, V. Vovk and A. Gammerman. Conformal Prediction with Neural Networks. In *Proceedings of the 19th IEEE International Conference on Tools with Artificial Intelligence (ICTAI'07)*, Volume 2, 388 - 395. IEEE Computer Society, 2007.
- Improving the Aggregating Algorithm for Regression. *Artificial Intelligence and Applications*, In *Proceedings of the 25th IASTED Conference Artificial Intelligence and Applications (AIA 2007)*, pp.347–352, Innsbruck, Austria, (2007), Editor: V.Devedzic (with S.Busutill and Y.Kalnishkan).
- Preanalytic Influence of Sample Handling on SELDI-TOF Serum Protein Profiles *Clinical Chemistry*, **53**, 645–656, April 2007, (with John F. Timms, Elif Arslan-Low, Aleksandra Gentry-Maharaj, Zhiyuan Luo, Davy T.Jampens, Vladimir N. Podust, Jeremy Ford, Eric T. Fung, Ian Jacobs, and Usha Menon).

- Application of Kolmogorov complexity and universal codes to identity testing and nonparametric testing of serial independence for time series. *Theoretical Computer Science*, v.359, No.1-3, August 2006; also in e-print archive, 2005, <http://arxiv.org/abs/cs/0505079> (with B.Ryabko and J.Astola).
- Transductive Learning. *Joint 3rd International Conference on Soft Computing and Intelligent Systems and 7th International Symposium on Advanced Intelligent Systems*, CD, Tokyo, Japan, 2006.
- Reliable classification of childhood acute leukaemia from gene expression data using Confidence Machines. *IEEE International Conference on Granular Computing*, Atlanta, USA, 2006 (with Z.Luo and A.Bellotti).
- Qualified Predictions for Microarray and Proteomics Pattern Diagnostics with Confidence Machines, *International Journal of Neural Systems* vol.15, No.4, pp.247-258, 2005 (with A.Bellotti, Z.Luo, F.van Delft and V.Saha).
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- On-line Predictions with Kernels and the Complexity Approximation *Proceedings of the Twentieth Conference on Uncertainty in Artificial Intelligence (UAI - 04)*, 2004, pp. 170-176, AUAI Press (with Yuri Kalnishkan, and Vladimir Vovk)
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- Plastid DNA splinters in nuclear genomes of rice and Arabidopsis. In: *European Journal of Biochemistry*, 269, Supplement 1, p. 51 (with Shahmuradov I.A., Akbarova Y. Yu. and Solovyev V.V)
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- Prediction algorithms and confidence measures based on algorithmic randomness theory, *Theoretical Computer Science*, 287 (2002) 209-217 (with V.Vovk).
- Qualified Predictions for Large Data Sets in the Case of Pattern Recognition. In: *Proceedings of the International Conference on Machine Learning and Applications (ICMLA'02)*, 2002, pp.159-163, CSREA Press (with Harris Papadopoulos, Kostas Proedrou and Volodya Vovk).
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- A combined Bayes-maximum likelihood method for regression. *Data Fusion and Perception*, Riccia, Lenz, Kruse eds, Springer-Verlag Wein New York, 2001 (with A. Chervonenkis and M. Herbster).
- Pattern Recognition and density estimation under the general i.i.d. assumption, *Proceedings of Computational Learning Theory (COLT)*, Amsterdam, 2001 (with I. Nouretdinov, M. V'yugin and V. Vovk)
- Support Vector Machine Learning Algorithm and Transduction. In: *Computational Statistics*, v.15, pp.31-39, 2000.
- N. Gilardi, A. Gammerman, M. Kanevski, M. Maignan, T. Melluish, C. Saunders, and V. Vovk. Application des methodes d'apprentissage pour l'etude des risques de pollution dans le lac leman. Colloque CLUSE sur les Risques Majeurs, 2000. (In French).

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- Transduction with Confidence and Credibility. *Proceedings of the International Joint Conference on Artificial Intelligence*, Stockholm, Sweden, 1999 (with V.Vovk and C.Saunders). (Postscript)
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- Statistical modelling in specific case analysis. *Science and Justice*, 36(4):245-255, 1996. (with C.G.G.Aitken, T.Connolly, G.Zhang, D.B.Bailey, R.Gordon and R.Oldfield)
- Bayesian belief networks with an application in specific case analysis. In A. Gammerman, editor, *Computational Learning and Probabilistic Reasoning*, pages 169-184. John Wiley & Sons, Chichester, 1996. (with C.G.G.Aitken, G.Zhang, T.Connolly, D.B.Bailey, R.Gordon and R.Oldfield)
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## Patents

*Data classification apparatus and method thereof* (with V. Vovk).

- European Patent Application No. 99 954 200.4: the application was allowed in July 2004.
- US Patent Application No. 09/831,262: allowed; (with V.Vovk).
- *Data labelling apparatus and method thereof*. UK Patent Application GB 0017740.2: pending.

## Technical Reports (selection)

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- Support Vector ANOVA decomposition (joint work with M. O. Stitson, A. Gammerman, V. Vapnik, C. Watkins and J. Weston). Technical Report CSD-TR-97-22, Department of Computer Science, Royal Holloway, University of London, November 1997.
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- Complexity Approximation Principle (joint work with V. Vovk). Technical Report CSD-TR-99-05, Department of Computer Science, Royal Holloway, University of London, January 1999.
- Transductive Confidence Machines for pattern recognition (joint work with K. Proedrou, I. Nourtdinov and V. Vovk). Technical Report CLRC-TR-01-02, Computer Learning Research Centre, Royal Holloway, University of London, June 2001.
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- Two New Kernel Least Squares Based Methods for Regression, (joint work with S. Busuttil and Y. Kalnishkan), March 2006.
- Data Analysis I - Comparison of Protocols, Version 2; (joint work with Ilia Nouretdinov, Brian Burford, Zhiyuan Luo, Alexey Chervonenkis and Volodya Vovk), June 2006;
- Data Analysis II: Comparison of Plasma Protocols (joint work with Ilia Nouretdinov, Brian Burford, Zhiyuan Luo, Alexey Chervonenkis, Volodya Vovk, Davy T'Jampens, Eric T.Fung, Elif Arslan-Low, Jeremy Ford, Aleksandra Gentry-Maharaj John Timms, Adam Rosenthal, Usha Menon and Ian Jacobs). 2006.
- Serum proteomic abnormality predating screen detection of ovarian cancer (joint work with Ilia Nouretdinov, Brian Burford, Zhiyuan Luo, Alexey Chervonenkis, Volodya Vovk, Musarat Kabir, John Timms, Paul Tempst, Josef Villanueva, Usha Menon and Ian Jacobs). 2007.