

Publications

Alexander Gammerman

Selected Publications

Books

1. A. Gammerman, (ed.) Probabilistic Reasoning and Bayesian Belief Networks. Alfred Waller, Henley-on-Thames, 1995.
2. A. Gammerman, (ed.) Computational Learning and Probabilistic Reasoning. John Wiley & Sons, Chichester, 1996.
3. A. Gammerman. Machine Learning: Progress and Prospects. ISBN 0 900145 93 5, 1997.
4. A. Gammerman, (ed.) Causal Models and Intelligent Data Management. Springer-Verlag, 1999.
5. V.Vovk, A.Gammerman and G.Shafer. Algorithmic learning in a random world. New York: Springer, 2005.
6. A.Gammerman, (ed.) Artificial Intelligence and Applications, Proceedings of the Conference, ACTA Press, ISBN: 978-0-88986-709-3, 2008.
7. Gammerman, A., Vovk, V. & Papadopoulos, H. (eds.). Statistical Learning and Data Sciences: Third International Symposium, SLDS 2015, UK, April 20-23, 2015, Springer LNAI, Proceedings, Vol. 9047.
8. V.Vovk, A.Gammerman and H.Papadopoulos (eds). Measures of Complexity. Festschrift in honor of Alexey Chervonenkis. Springer, 2015.
9. Alexander Gammerman, Zhiyuan Luo, Jesus Vega and Vladimir Vovk (Eds.) Conformal and Probabilistic Prediction with Applications 5th International Symposium, COPA 2016 Madrid, Spain, April 20 – 22, 2016 Proceedings. Lecture Notes in Artificial Intelligence, Springer, 9653, 2016.

Special Issues of Journals

10. A.Gammerman and V.Vovk (editors). Special Issue on Kolmogorov Complexity. *The Computer Journal*, vol. 42, no. 4, pp.254-347, (1999).
11. 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.
12. Alexander Gammerman and Vladimir Vovk. The 2nd British Computer Society Lecture. Hedging Predictions in Machine Learning. Published with discussion in *The Computer Journal*, v.50, No.2, 151-163, March 2007. The same journal also published: i) Discussion on Hedging Predictions in Machine Learning. *The Computer Journal*, 2007, 50: 164-172; ii) Rejoinder Hedging Predictions in Machine Learning. *The Computer Journal*, 2007, 50: 173-177.
13. Alex Gammerman, Ilia Nouretdinov, Brian Burford Alexey Chervonenkis, Vladimir Vovk and Zhiyuan Luo. Clinical Mass Spectrometry Proteomic Diagnosis by Conformal Predictors. *Statistical Applications in Genetics and Molecular Biology Journal*, Volume 7, Issue 2 2008 Article 13, 2008.
14. Alexander Gammerman. Conformal Predictors. *Progress in Artificial Intelligence*, v.1, No.3, 2012
15. Harris Papadopoulos, Volodya Vovk, Alex Gammerman. *Annals of Mathematics and Artificial Intelligence*, vol.74 (1-2), May-June 2015. Guest editors of the Special issue on Conformal Prediction and its Applications. DOI 10.1007/s10472-014-9429-3, 2015.
16. Alex Gammerman and Vladimir Vovk (editors). Special Issue of Journal of Machine Learning Research (JMLR) in memory of Alexey Chervonenkis. 16 (Sep), 2015.
17. Alexander Gammerman and Vladimir Vovk (eds.). *Annals of Mathematics and Artificial Intelligence*, October 2017, Volume 81, Issue 1– 2. Special issue on Conformal and Probabilistic Prediction with Applications; 2017.
18. Alex Gammerman, Vladimir Vovk, Zhiyuan Luo, Harris Papadopoulos (eds). Conformal and Probabilistic Prediction and Applications. *Proceedings of Machine Learning Research* vol.60; 13-16 June 2017, Stockholm, Sweden; 2017.
19. Alex Gammerman, Vladimir Vovk, Zhiyuan Luo, Eugeny Smirnov and Ralf Peeters (eds). Conformal and Probabilistic Prediction and Applications. *Proceedings of Machine Learning Research* vol.91, 2018.
20. Alex Gammerman, Vladimir Vovk, Zhiyuan Luo, Eugeny Smirnov (eds). Conformal and Probabilistic Prediction and Applications. *Proceedings of Machine Learning Research* vol.105, 2019.

21. Alexander Gammerman, Vladimir Vovk, Henrik Boström, Lars Carlsson (eds). *Machine Learning*, Vol. 108, No. 3, 03.2019. *Conformal and probabilistic prediction with applications: editorial*, ISSN: 0885-6125 (Print) 1573-0565 (Online), 2018.
22. Alexander Gammerman, Vladimir Vovk, Zhiyuan Luo, Evgueni Smirnov, Giovanni Cherubin (eds.). Conformal and Probabilistic Prediction and Applications. *Proceedings of Machine Learning Research*, v128, 2020.

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

23. V. Vovk, I. Petej, I. Nouretdinov, V. Manokhin and A. Gammerman. *Neurocomputing*, 397, 292–308; 2020.
24. Vladimir Vovk, Ivan Petej, Paolo Toccaceli, Alexander Gammerman, Ernst Ahlberg, Lars Carlsson. Conformal calibrators. *Proceedings of Machine Learning Research*, v.128, pp. 84–99; 2020.
25. Ilia Nouretdinov, Alexander Balinsky, Alexander Gammerman. *Proceedings of Machine Learning Research*, v.128, pp.151–170; 2020.
26. Alexander Gammerman, Vladimir Vovk, Zhiyuan Luo, Evgueni Smirnov, Giovanni Cherubin, Marco Christini. Preface. *Proceedings of Machine Learning Research*, v.128, pp.1–3; 2020.
27. Paolo Toccaceli and Alexander Gammerman Combination of inductive Mondrian conformal predictors. *Machine Learning*, Vol. 108, No. 3, 03.2019, p. 489–510, 2019.
28. Alexander Gammerman. Reliable Pattern Recognition by Conformal Predictors. *Proceedings of Computer Data Analysis and Modelling*, Minsk, 2019.
29. Alex Gammerman, Vladimir Vovk, Zhiyuan Luo, Harris Papadopoulos. Preface. *Proceedings of Machine Learning Research*; vol.60; PMLR 60:1-2; 2017.
30. Paolo Toccaceli and Alexander Gammerman. Combination of Conformal Predictors for Classification. *Proceedings of Machine Learning Research*; PMLR 60:39-61; 2017.
31. Denis Volkhonskiy, Evgeny Burnaev, Ilia Nouretdinov, Alexander Gammerman, Vladimir Vovk; Inductive Conformal Martingales for Change-Point Detection; *Proceedings of Machine Learning Research*; PMLR 60:132-153; 2017.

32. Paolo Toccaceli, Ilia Nouretdinov and Alexander Gammerman. Conformal prediction of biological activity of chemical compounds. *Annals of Mathematics and Artificial Intelligence*, October 2017, Volume 81, Issue 1– 2. DOI 10.1007/s10472-017-9556-8; 2017.
33. Alexander Gammerman and Vladimir Vovk. Foreword: conformal and probabilistic prediction with applications. *Annals of Mathematics and Artificial Intelligence*. DOI 10.1007/s10472-017-9557-7; 2017.
34. Vladimir Vovk, Valentina Fedorova, Ilia Nouretdinov and Alex Gammerman. Criteria of Efficiency for Conformal Prediction. In: Alexander Gammerman, Zhiyuan Luo, Jesus Vega and Vladimir Vovk (Eds.) Conformal and Probabilistic Prediction with Applications 5th International Symposium, COPA 2016 Madrid, Spain, April 20 – 22, *Lecture Notes in Artificial Intelligence*, Springer, 9653, 2016.
35. Paolo Toccaceli, Ilia Nouretdinov and Alexander Gammerman. Conformal Predictors for Compound Activity Prediction. In: Alexander Gammerman, Zhiyuan Luo, Jesus Vega and Vladimir Vovk (Eds.) Conformal and Probabilistic Prediction with Applications 5th International Symposium, COPA 2016 Madrid, Spain, April 20–22, 2016 Proceedings. *Lecture Notes in Artificial Intelligence*, Springer, 9653, 2016.
36. Alex Gammerman, Vladimir Vovk; Preface to the Special Issue of JMLR in memory of Alexey Chervonenkis *Journal of Machine Learning Research*, 16(Sep): 1677– 1681, 2015.
37. Smith, J., Nouretdinov, I., Craddock, R., Offer, C. & Gammerman, A. Conformal Anomaly Detection of Trajectories with a Multi-class Hierarchy Statistical Learning and Data Sciences: Third International Symposium, SLDS 2015, Egham, UK, April 20-23, 2015; Gammerman, A., Vovk, V. & Papadopoulos, H. (eds.). Springer *Lecture Notes in Artificial Intelligence*, Vol. 9047, p. 281-290 10 p.
38. Cherubin, G., Nouretdinov, I., Gammerman, A., Jordaney, R., Wang, Z., Papini, D. & Cavallaro, L. Conformal Clustering and Its Application to Botnet Traffic. Statistical Learning and Data Sciences: Third International Symposium, SLDS 2015, Egham, UK, 2015. Gammerman, A., Vovk, V. & Papadopoulos, H. (eds.). Springer *Lecture Notes in Artificial Intelligence*, 2015, Vol. 9047, p. 313-322 10 p.
39. Alexander Gammerman. Forward to the book *Conformal Predictions for Reliable Machine Learning: Theory, Adaptations and Applications*; editors: Vineeth Balasubramanian, Shen-Shyang Ho, Vladimir Vovk. Springer, 2014.
40. Ilia Nouretdinov, Tony Bellotti and Alexander Gammerman. Diagnostic and Prognostic by Conformal Predictors. Published in: *Conformal*

Predictions for Reliable Machine Learning: Theory, Adaptations and Applications, pp.217–230; editors: Vineeth Balasubramanian, Shen-Shyang Ho, Vladimir Vovk. Springer, 2014.

41. Tony Bellotti, Ilia Nouretdinov, Meng Yang, Alex Gammerman. Feature Selection by Conformal Predictors. Published in: *Conformal Predictions for Reliable Machine Learning: Theory, Adaptations and Applications*, pp.115–130; editors: Vineeth Balasubramanian, Shen-Shyang Ho, Vladimir Vovk. Springer, 2014.
42. Antonis Lambrou, Harris Papadopoulos, Ilia Nouretdinov, and Alexander Gammerman. Reliable Probability Estimates Based on Support Vector Machines for Large Multiclass Datasets. *AIAI* (2) 2012: 182-191, 2012.
43. Ilia Nouretdinov, Dmitry Devetyarov, Brian Burford, Volodya Vovk, Stephane Camuzeaux, Aleksandra Gentry-Maharaj, Ali Tiss, Celia Smith, Zhiyuan Luo, Alexey Chervonenkis, Rachel Hallett, Mike Waterfield, Rainer Cramer, John F. Timms, Ian Jacobs, Usha Menon and Alex Gammerman. Multiprobabilistic Prediction in Early Medical Diagnoses. *Annals of Mathematics and Artificial Intelligence*, Sept.2014.
44. Brian Burford, Aleksandra Gentry-Maharaj, Rosalind Graham, Diane Allen, Johannes Pedersen, Aaron Nudelman, Ola Blixt, Evangelia-Ourania Fourkala, Deanna Bueti, Anne Dawnay, Jeremy Ford, Rakshit Desai, Leonor David, Peter Trinder, Bruce Acres, Tilo Schwientek, **Alex Gammerman**, Celso Reis, Luisa Silva, Hugo Osorio, Rachel Hallett, Hans Wandall, Ulla Mandel, Michael A Hollingsworth, Ian Jacobs, Ian Fentiman, Henrik Clausen, Joyce Taylor-Papadimitriou, Usha Menon, and Joy Burchell.
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45. Valentina Fedorova, Alex Gammerman, Ilia Nouretdinov and Vladimir Vovk. Conformal prediction under hypergraphical models. In *Proceedings of the 9th Artificial Intelligence Applications and Innovations Conference (AIAI)*, pp.371–383, Springer, 2013.
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47. Ilia Nouretdinov, Alex Gammerman, Yanjun Qi, Judith Klein-Seetharaman. Determining Confidence of Predicted Interactions Between HIV-1 and Human Proteins Using Conformal Method *Pacific Symposium on Biocomputing*, 17. p. 311–322; 2012
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54. Harris Papadopoulos, Alexander Gammerman, Volodya Vovk Confidence Predictions for the Diagnosis of Acute Abdominal Pain. *Artificial Intelligence Applications and Innovations III*, Proceedings of the 5TH IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI'2009), April 23-25, 2009, Thessaloniki, Greece; 01/2009
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- Engineering and Physical Sciences Research Council (EPSRC), grant GR/L35812, PI. “Support Vector and Bayesian Learning Algorithms: Analysis and Applications” (with V. Vovk and V. Vapnik), £142,360*. 1997–2000.
- Engineering and Physical Sciences Research Council (EPSRC), grant GR/M16856, PI. “Comparison of the Support Vector Machine and Minimum Message Length methods for induction and prediction” (with V. Vovk and C. Wallace), £132,787* 1999–2002.
- Engineering and Physical Sciences Research Council (EPSRC), grant GR/R46670/01, PI. “Complexity Approximation Principle and Predictive Complexity: Analysis and Applications” (with Prof. V. Vovk), £142,996*, 2001–2004.
- Biotechnology and Biological Sciences Research Council (BBSRC), grant 111/BIO14428, PI. “Pattern Recognition Techniques for Gene and Promoter Identification and Classification in Plant Genomic Sequences” (with J. Hancock and V. Solovyev), £145,210*, 2002– 2005.
- European Union (EU), grant IST-1999-10226, PI. “EurEdit: The Development and Evaluation of New Methods for Editing and Imputation” (with European partners from Italy, the Netherlands, Switzerland, Portugal), RHUL part: £86,809*, 2000–2003.
- Royal Society grant, PI, “Efficient randomness testing of random and pseudorandom number generators” (with B. Ryabko), £4,961, 2003–2005.
- Medical Research Council (MRC), grant G0301107 (S505/65), PI. “Proteomic Analysis of the Human Serum Proteome” (with I. Jacobs,

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- QinetiQ grant: “Automated Target Identification”. £47,000 2006–2007. (total funding £47,000).
- Research Promotion Foundation of Cyprus. “ASPIDA project: Development of New Conformal Prediction Methods with Applications in Medical Diagnosis”, PI, (with H. Papadopoulos and V. Vovk), £30,770, 2007–2010.
- Engineering and Physical Sciences Research Council “Practical competitive prediction” (with V. Vovk and Y. Kalnishkan), co-PI, £406,000, 2007–2010.
- Department for Environment, Food and Rural Affairs (Defra), Veterinary Laboratories Agency, “Application of Pattern Recognition techniques to Bioinformatics.” PI, £82,000, 2007–2010.
- European Union EU FP7 programme: “Post-translational modification, O-PTM”, HEALTH-2007-2.4.1-2: Translating clinical ‘omics’-technology (genomics, proteomics, metabolomics) into innovative cancer biomarkers aiding in early diagnosis, prognosis and treatment selection of cancer patients. (with Dr Joy Burchell, Prof Joyce Taylor-Papadimitriou, KCL; Z.Luo and V.Vovk from RHUL and 5 other institutions), PI, £193,046, 2008–2011. (total funding £5 mln euros).
- Medical Research Council (MRC) Application of conformal predictors to functional magnetic resonance fMRI imaging research; PI, £85,581, 2009–2010.
- Royal Society grant, "Trace Detection with Confidence for Odor Capture Hybrid Sensor System co-PI, (with Z.Luo), £7,800, 2009–2010.
- Department for Environment, Food and Rural Affairs (Defra), Veterinary Laboratories Agency (VLA). Machine learning algorithms for analysis of large veterinary datasets; PI, £52,000, 2010–2013.
- BBSRC (and EU) programme: Living with uninvited guests: comparing plant and animal responses to endocytic invasions (ERASysBio). BBSRC project (with VLA, SGUL, Spain, Germany and France); co-PI; over £700,000 for RHUL part, 2010–2013. (total funding 5,200 000 euros).
- Zhejiang University, China: Machine learning methods for coal quality analysis based on NIR technology, 2011–2013 (co-PI with Z.Luo).
- Thales UK; Development of automated methods for helping detection of anomalous behaviour. £85,000; 2012–2015.

- EPSRC: Mining the Network Behaviour of Bots (with L.Cavalarro, V.Vovk, H.Shanahan and Z.Luo); £680,623 from 1-06-13 for 3 years until 2016.
- EU Horizon 2020 grant: "Exascale Compound Activity Prediction Engine"; 2015 – 2018.
- AstraZeneca grant: Machine Learning for Drug Discovery, 2018–2020.

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- Learning by Support Vector Machine (with V. Vovk). Tutorial. Uxbridge, Middlesex: UNICOM Seminars Ltd., 1998.

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.