

Curriculum Vitae(short)

Alexander Gammerman

Office Address

Centre for Machine Learning
Department of Computer Science
Royal Holloway, University of London
Egham, Surrey TW20 0EX, UK
Phone: +44-1784-443434
website: <http://www.gammerman.com>
email: A.Gammerman@rhul.ac.uk
aygammerman@gmail.com

Research Areas

Pattern recognition; Machine learning; Pattern recognition, applications in medicine, forensic science, homeland security, bioinformatics, drug discovery and other fields.

Employment

1983 – 1993 Department of Computer Science, Heriot-Watt University, Edinburgh, UK, Reader.

1993-present Department of Computer Science Royal Holloway, University of London

- Professor of Computer Science 1993 – present.
- Head of Computer Science Department 1995–2005
- Founding Director of Centre for Reliable Machine Learning (formerly CLRC) 1998 – present.

Research and Expertise

- *Publications*: 9 books authored and edited; about 200 refereed publications, including books, journal papers and conference proceedings.
- *Research Grants*: the major grants from EU Framework 6,7; EPSRC, BBSRC, MRC, UK government, China, Cyprus government, industry, etc. in total over £7 millions.

- *PhD students*: supervised and co-supervised 28 research postgraduate students; currently supervising 2 PhD students.
- *Program Chairs and Committees at Conferences, Symposiums, Seminars*: The most recent ones are:
 - COPA. Eleven conferences on Conformal and Probabilistic Predictors with Applications (COPA) from 2012 to 2022 (co-Chair).
 - SLDS. Symposium on Statistical Learning and Data Sciences (SLDS), SLDS2015, London, April 2015 (co-Chair).
 - Kolmogorov Lecture and Medal at University of London ; 2003 – present (co-Chair).
 - Programme Committees of IEEE International Conference on Data Mining series (ICDM), 2011, 2012, 2013, 2014, 2015, 2016.
 - Indo-UK initiative in Applied Mathematics in Hyderabad, India, December 2015.
- *Kolmogorov Lecture and Medal*

Since 2003 chaired the Program and Organisation Committee of the University of London Kolmogorov Lecture and Medal - see <http://kolmogorov.cml.rhul.ac.uk/>

- *Invited and Plenary Talks*: presented many invited talks in the UK, Europe and Russia.

For detailed research programme, grants, publications, and teaching - see <https://cml.rhul.ac.uk/people.html>

Awards and Prizes

- P.W. Allen Prize of Forensic Science Society, 1996.
- Transductive Learning. Best paper prizes at SCIS and ISIS *Joint 3rd International Conference on Soft Computing and Intelligent Systems* and 7th International Symposium on Advanced Intelligent Systems, Tokyo, Japan, 2006.
- Reliable classification of childhood acute leukaemia from gene expression data using Confidence Machines. Best paper award at *IEEE International Conference on Granular Computing* Atlanta, USA, 2006 (joint work with Z.Luo and A.Bellotti).
- AIA-08 Prize: Modern algorithms in Machine Learning. Artificial Intelligence and Applications Conference-08, Innsbruck, Austria, 2008.

- Multivariate Statistical Analysis conference prize: Confidence Estimation for high-dimensional data; Tsachkadzor, Armenia, 2016.
- IDEAL conference. Statistical and Algorithmic Learning. Madrid, 2018.
- Computer Data Analysis and Modelling (CDAM) conference. Reliable Pattern Recognition by Conformal Predictors, Minsk, 2019.

Honorary, Distinguished and Visiting Professorships

- Visiting Professor at School of Telecommunications
University Polytechnic de Madrid, Madrid, Spain, 2003.
- Senior Research Scientist, Department of Computer Science and Center
Computer Learning Systems, Columbia University
New York, USA, 2004.
- Honorary Professor, University College London, from 2006 – 2010.
- Visiting Professor, University of Paris 9 (Dauphine), 2008 – 2009.
- Distinguished Professor (Profesor visitante distinguido Santander-UCM)
of Complutense University de Madrid, Spain, 2010.

Learned Societies

- Fellow of the Royal Statistical Society; 1985 – present.
- British Classification Society, 2011 – 2010
- Royal Academy of Arts, 2005-2010.

Research

Recent 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.
- 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.
- V.Vovk, A.Gammerman and H.Papadopoulos (eds). Measures of Complexity. Festschrift in honor of Alexey Chervonenkis. Springer, 2015.
- 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

- 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.
- 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.

- 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.
- Alex Gammerman and Vladimir Vovk (guest editors). Special Issue of Journal of Machine Learning Research (JMLR) in memory of Alexey Chervonenkis, September, 2015.
- Alexander Gammerman and Vladimir Vovk (eds.). *Annals of Mathematics and Artificial Intelligence*. Special issue on Conformal and Probabilistic Prediction with Applications; 2017.
- 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.
- 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, Maastricht, The Netherlands; June 2018.
- Alex Gammerman, Vladimir Vovk, Zhiyuan Luo, Eugeny Smirnov (eds). Conformal and Probabilistic Prediction and Applications. *Proceedings of Machine Learning Research* vol.105; Varna, Bulgaria; 9–11 September 2019.
- Alexander Gammerman, Vladimir Vovk, Henrik Bostrom, Lars Carlsson (eds). *Machine Learning*, Vol. 108, No. 3, 03.2019.
- 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**

- Alexander Gammerman, Vladimir Vovk and Marco Cristani. Special Issue on Conformal and Probabilistic Prediction with Applications. *Pattern Recognition*, Volume 126, June 2022.
- Vladimir Vovk, Ilia Nouretdinov and Alexander Gammerman. Conformal testing: binary case with Markov alternatives. *Proceedings of the 11th Symposium on Conformal and Probabilistic Prediction and Applications*, Brighton, 2022.

- Patrizio Giovannotti, Alex Gammerman. Transformer-based conformal predictors for paraphrase detection. *Proceedings of Machine Learning Research*, v.152:243-265, 2021.
- I. Nourtdinov, V. Vovk and A. Gammerman, "Conformal Change point Detection in Continuous Model Situations," *Proceedings of the Tenth Symposium on Conformal and Probabilistic Prediction and Applications*, Egham, 2021.
- Vladimir Vovk, Ivan Petej, Ilia Nourtdinov, Ernst Ahlberg, Lars Carlsson, and Alex Gammerman. Retrain or not retrain: Conformal test martingales for change-point detection. *Proceedings of Machine Learning Research* 152:191-210, 2021.
- Vovk, Vladimir; Petej, Ivan; Nourtdinov, Ilia; Manokhin, Valery; Gammerman, Alex. Computationally efficient versions of conformal predictive distributions. *Neurocomputing*, 397, 292–308; 2020.
- 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.
- Ilia Nourtdinov, Alexander Balinsky, Alexander Gammerman. Conformal anomaly detection for visual reconstruction using gestalt principles. *Proceedings of Machine Learning Research*, v.128, pp.151–170; 2020.
- Paolo Toccaceli and Alexander Gammerman. Combination of inductive Mondrian conformal predictors. *Machine Learning*, Vol. 108, No. 3, 03.2019, p. 489 – 510, 2019.
- Alexander Gammerman. Reliable Pattern Recognition by Conformal Predictors. *Proceedings of Computer Data Analysis and Modelling*, Minsk, 2019.
- Paolo Toccaceli, Ilia Nourtdinov and Alexander Gammerman. Conformal prediction of biological activity of chemical compounds. *Annals of Mathematics and Artificial Intelligence* DOI 10.1007/s10472-017-9556-8; 2017.
- Vladimir Vovk, Valentina Fedorova, Ilia Nourtdinov 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, 2016 Proceedings*. Lecture Notes in Artificial Intelligence, Springer, 9653, 2016.
- Smith, J., Nourtdinov, 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, Springer LNAI Proceedings. Gammerman, A., Vovk, V. & Papadopoulos, H. (eds.). Vol. 9047, p. 281-290 10 p.

- 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.
- Ilia Nouretdinov, Alex Gammerman et al.. Multiprobabilistic Prediction in Early Medical Diagnoses. *Annals of Mathematics and Artificial Intelligence*, v.74, 1, p. 203-222, Sept.2014.

Recent Grants

- EPSRC: Mining the Network Behaviour of Bots. Co-PI, 2013 – 2016.
- EU Horizon 2020 grant: "Exascale Compound Activity Prediction Engine";PI, 2015 – 2018.
- AstraZeneca, Sweden; "Machine Learning for Drug Discovery"; PI, 2017–2020.
- Amazon Research Award "Conformal martingales for change-point detection", PI, 2020 – 2021.

Teaching

I have taught at all levels of Computer Science at different Universities mainly in England and Scotland but also in Spain, France and Russia. I have taught a wide variety of different courses from first-year students to Master level students and from the theory of computation to very practical programming courses.

Administration

- **Computer Science Department**

From 1995 to 2005 I was serving as Head of the Computer Science.

- **RAE 1996** and **RAE 2001**. I was responsible for submissions of two Research Assessment Exercises (RAE) in 1996 and 2001. The department moved from grade 4 in 1996 to grade 5 in 2001 and was ranked the 9th in the country: <https://www.theguardian.com/education/researchratings/table/0,,-4319358,00.html?view=2&index=2> The RAE 2001 Panel feedback stated: "The Panel were impressed by the strength within the Computer Learning Group and the profound impact that their work has had on theory and applications".

- **Centre for Reliable Machine Learning – CRML (formerly Computer Learning Research Centre – CLRC)**

In 1998 in recognition of our research in machine learning, the College established CRML for fundamental and applied research in machine learning and I was appointed as the Director of the Centre.