Curriculum Vitae(short)
Alexander Gammerman

Office Address

Centre for Reliable 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

Machine learning; Pattern recognition, applications in Medicine, Drug Discovery, Forensic Science, Homeland Security and other fields.

Education

BSc in Physics and Ph. D. degree (kandidat fiziko-matematicheskih nauk) awarded in 1974, St.Petersburg.

Employment

1974 - 1983 Regional Research Computer Centre, Senior Research Fellow; St.Petersburg, Russia.

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

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, Horizon 2020; EPSRC, BBSRC, MRC, UK government, China, Cyprus government, industry, etc. in total over £7 million.
- *PhD students*: supervised and co-supervised 31 research postgraduate students.
- *Program Chairs and Committees at Conferences, Symposiums, Seminars*:
  - 13 conferences on Conformal and Probabilistic Predictors with Applications (COPA) from 2012 to 2024 (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 - 2016.

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.

Editorial Boards

- Editorial Board: The Law, Probability and Risk journal: 2002 – 2009.
- Editorial Board: The Computer Journal: 2005 – 2008.

Learned Societies

- Fellow of the Royal Statistical Society; 1985 – present.
- British Classification Society, 2011 – present.
- 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.Papadoupolus (eds). Measures of Complexity. Festchrift 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). *M*achine 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.
- Alexander Gammerman, Vladimir Vovk and Marco Cristani. Special Issue on Conformal and Probabilistic Prediction with Applications. *Pattern Recognition*, Volume 126, June 2022.

Refereed Book Chapters, Journal Papers, Conference Proceedings

- Patrizio Giovannotti, Alexander Gammerman. *Proceedings of the Thirteenth Symposium on Conformal and Probabilistic Prediction with Applications*, PMLR v.230:218-235; 2024.
- Ilia Nouretdinov and Alex Gammerman. The Venn-ABERS Testing for Change-Point Detection. *Proceedings of the Twelfth Symposium on Conformal and Probabilistic Prediction with Applications*, 204:367-368; 2023.

- 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. Nouretdinov, 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 Nouretdinov, 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; Nouretdinov, 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 Nouretdinov, 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 Nouretdinov 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 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, 2016 Proceedings. Lecture Notes in Artificial Intelligence, Springer, 9653, 2016.

- 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, 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: *C*onformal 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. 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 have been taught.

Administration

- **Computer Science Department**

  From 1995 to 2005 served as Head of Computer Science.

- **RAE 1996** and **RAE 2001**. 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. I have been serving as the Director (and since 2012 as co-Director) of the Centre.