Curriculum Vitae

Yuri Kalnishkan

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Contact Details

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Employment

2003–now Lecturer, Department of Computer Science and Computer Learning Research Centre, Royal Holloway, University of London;

2001–2003 Research Assistant, Department of Computer Science, Royal Holloway, University of London;

1997 translating parts of the book 'Introduction to Algorithms' by T. Cormen, C. Leiserson, and R. Rivest into Russian. Moscow Center for Continuous Mathematical Education, Russia.

Education

1998–2002 PhD, Department of Computer Science and Computer Learning Research Centre, Royal Holloway, University of London. Dissertation: The Aggregating Algorithm and Predictive Complexity.

1993–1998 MSc in Mathematics and Applied Mathematics, Department of Mechanics and Mathematics, Lomonosov Moscow State University, Russia. Specialisation: mathematical logic and theory of algorithms. Average grade 4.97 of 5; a distinction ('red diploma') awarded.

1993 Attestat (Certificate of Secondary School Education) school No. 35 with advanced teaching of English, Moscow, Russia. Average grade 5 of 5; a gold medal awarded.

Training

2005 Certificate in Academic Practice in Teaching and Learning, Royal Holloway, University of London.

Professional Membership

since 2005 The Higher Education Academy, UK, Practitioner.

Examining and External Service

2007 an external member of the panel evaluating a proposed MSc programme, University of Ulster;

2005 an examiner of the PhD dissertation by Daniil Ryabko, Department of Computer Science, Royal Holloway, University of London.

Program Committee Membership

2009 Workshop on Advances in Machine Learning for Computational Finance, UCL, London.

2007 The 18th International Conference on Algorithmic Learning Theory, ALT 2007.

Reviewing

- a book proposal for the Springer-Verlag;
- journal papers for Theoretical Computer Science, Journal of Computer and System Sciences, Signal Processing, Machine Learning and Journal of Machine Learning Research;
- papers for the annual international conferences COLT (Computational Learning Theory), ALT (Algorithmic Learning Theory), and STACS (Theoretical Aspects of Computer Science).

Research Students

PhD Steven Busuttil (PhD awarded 2008)

PhD Vladimir Repisky (since 2008)

PhD Tim Scarfe (since 2009)

MSc Sergey Kuleshov (MSc with Merit awarded 2008)

Grants and Awards

2010 best paper award at the 6th IFIP Conference on Artificial Intelligence Applications and Innovations, AIAI 2010, with F. Zhdanov;

2007–2010 co-investigator on the EPSRC grant EP/F002998 'Practical competitive prediction';

2001–2003 funded by the EPSRC grant GR/R46670 'Complexity Approximation Principle and Predictive Complexity: Analysis and Applications', of which grant I was a co-author of the proposed research;

1998–2001 PhD funded by the Overseas Research Scholarship Award;

1999 E. Mark Gold Award for the best student paper at the 10th International Conference on Algorithmic Learning Theory held in Tokyo, Japan.

Publications

Refereed Journals

1. A. Chernov, Y. Kalnishkan, F. Zhdanov, and V. Vovk. Supermartingales in Prediction with Expert Advice. *Theoretical Computer Science,* 411(29–30): 2647–2669 (2010).

2. Y. Kalnishkan and M. V. Vyugin. The weak aggregating algorithm and weak mixability. *Journal of Computer and System Sciences,* 74(8): 1228–1244 (2008).

3. Y. Kalnishkan, V. Vovk, and M. V. Vyugin. How many strings are easy to predict? *Information and Computation,* 201: 55–71 (2005).

4. Y. Kalnishkan, V. Vovk, and M. V. Vyugin. Loss functions, complexities, and the Legendre transformation. *Theoretical Computer Science,* 313(2): 195-207 (2004).

5. A. M. Raigorodskii and Yu. A. Kalnishkan. On Borsuk's Problem in $\mathbb{R}^3$. *Matematicheskie Zametki*, 74(1):149-152 (2003) (in Russian). English translation in *Mathematical Notes,* 74(1):144-146, Springer, 2003.

6. Y. Kalnishkan. General linear relations among different types of predictive complexity. *Theoretical Computer Science,* 271: 181–200 (2002).

Refereed Conference Proceedings

7. F. Zhdanov and Y. Kalnishkan. An Identity for Kernel Ridge Regression. In *Proceedings of the 21st International Conference on Algorithmic Learning Theory,* vol. 6331 of *Lecture Notes in Computer Science,* pages 405–419, Springer, 2010.

8. F. Zhdanov and Y. Kalnishkan. Linear Probability Forecasting. In *Proceedings of the 6th IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI 2010),* pages 4–11, Springer, 2010.

9. A. Chernov, Y. Kalnishkan, F. Zhdanov, and V. Vovk. Supermartingales in Prediction with Expert Advice. In *Algorithmic Learning Theory, 19th International Conference, ALT 2008, Proceedings,* vol. 5254 of *Lecture Notes in Computer Science,* pages 199–213. Springer, 2008.

10. S. Busuttil and Y. Kalnishkan. On-line Regression Competitive with Changing Predictors. In *Algorithmic Learning Theory, 18th International Conference, ALT 2007, Proceedings,* vol. 4754 of *Lecture Notes in Computer Science,* pages 181–195. Springer, 2007.

11. S. Busuttil and Y. Kalnishkan. Weighted Kernel Regression for Predicting Changing Dependencies. In *Machine Learning: ECML 2007, 18th European Conference on Machine Learning,* vol. 4701 of *Lecture Notes in Computer Science,* pages 535–542. Springer, 2007.

12. Y. Kalnishkan, V. Vovk and M. V. Vyugin. Generalised Entropy and Asymptotic Complexities of Languages. In *Learning Theory, 20th Annual Conference on Learning Theory, COLT 2007,* vol. 4539 of Lecture Notes in Computer Science, pages 293–307, Springer 2007.

13. Y. Kalnishkan and M. V. Vyugin. The Weak Aggregating Algorithm and weak mixability. In *Learning Theory, Proceedings of the 18th Annual Conference (COLT 2005),* vol. 3559 of *Lecture Notes in Artificial Intelligence,* Springer, 2005.

14. Y. Kalnishkan, V. Vovk, and M. V. Vyugin. A criterion for the existence of predictive complexity for binary games. In *Algorithmic Learning Theory, 15th International Conference, ALT 2004, Proceedings,* vol. 3244 of *Lecture Notes in Artificial Intelligence,* Springer, 2004.

15. A. Gammerman, Y. Kalnishkan, and V. Vovk. On-line prediction with kernels and the Complexity Approximation Principle. In *Uncertainty in Artificial Intelligence,* Proceedings of the Twentieth Conference, AUAI press, 2004.

16. Y. Kalnishkan, V. Vovk, and M. V. Vyugin. How many strings are easy to predict? In *16th Annual Conference on Learning Theory (COLT) and 7th Annual Workshop on Kernel Machines, Proceedings,* vol. 2777 of *Lecture Notes in Artificial Intelligence,* Springer, 2003.

17. Y. Kalnishkan and M. V. Vyugin. On the absence of predictive complexity for some games. In *Algorithmic Learning Theory 13th International Conference, ALT 2002,* vol. 2533 of *Lecture Notes in Artificial Intelligence,* Springer, 2002.

18. Y. Kalnishkan and M. V. Vyugin. Mixability and the existence of weak complexities. In *Computational Learning Theory 15th Annual Confer-*

ence, COLT 2002, vol. 2533 of *Lecture Notes in Artificial Intelligence,* Springer, 2002.

19. Y. Kalnishkan, M. V. Vyugin, and V. Vovk. Loss functions, complexities, and the Legendre transformation. In *Algorithmic Learning Theory 12th International Conference, ALT 2001,* vol. 2225 of *Lecture Notes in Artificial Intelligence,* Springer, 2001.

20. Y. Kalnishkan. Complexity approximation principle and Rissanen's approach to real-valued parameters. In *Machine Learning: ECML 2000, 11th European Conference on Machine Learning,* vol. 1810 of *Lecture Notes in Artificial Intelligence,* Springer, 2000.

21. Y. Kalnishkan. General linear relations among different types of predictive complexity. In *Algorithmic Learning Theory, 10th International Conference, ALT'99,* vol. 1720 of *Lecture Notes in Artificial Intelligence,* Springer, 1999.

22. Y. Kalnishkan. Linear relations between square-loss and Kolmogorov complexity. In *Proceedings of the Twelfth Annual Conference on Computational Learning Theory,* Assoc. for Computing Machinery, 1999.

Technical Reports

23. F. Zhdanov and Y. Kalnishkan, Linear Probability Forecasting. Technical report `arXiv:1001.0879v1 [cs.LG]` (2010).

24. F. Zhdanov, A. Chernov, and Y. Kalnishkan, Aggregating Algorithm competing with Banach lattices. Technical report `arXiv:1002.0709v1 [cs.LG]` (2010).

25. Y. Kalnishkan, The Aggregating Algorithm as Laissez-Faire Investment. Technical Report CLRC–TR–09–02, Computer Learning Research Centre, Royal Holloway, University of London, September 2009.

26. Y. Kalnishkan, An Introduction to Kernel Methods. Technical Report CLRC–TR–09–01, Computer Learning Research Centre, Royal Holloway, University of London, May 2009.

27. S. Busuttil, Y. Kalnishkan and A. Gammerman, Two New Kernel Least Squares Based Methods for Regression. Technical Report CLRC–TR–06–01, Computer Learning Research Centre, Royal Holloway, University of London, March 2006.

28. Y. Kalnishkan, V. Vovk, and M. V. Vyugin. A criterion for the existence of predictive complexity for binary games. Technical Report CLRC–TR–04–04, Computer Learning Research Centre, Royal Holloway, University of London, March 2004.

29. Y. Kalnishkan and M. V. Vyugin. The Weak Aggregating Algorithm and weak mixability. Technical Report CLRC–TR–03–01, Computer Learning Research Centre, Royal Holloway, University of London, November 2003.

30. Y. Kalnishkan and V. Vovk. The existence of predictive complexity and the Legendre transformation. Technical Report TR–00–04, Computer Learning Research Centre, Royal Holloway College, May 2000. Presented at TAI 2000, Fourth French Days on Algorithmic Information Theory.

Recent Talks

2010 From Competitive Investment to Aggregating Algorithm and Defensive Forecasting, *The 2010 Workshop on Game-Theoretic Probability and Related Topics.*

2009 Introduction to Competitive Prediction, *Yandex and Institute for information transmission problems of the Russian Academy of Sciences*, Moscow, Russia

2009 Ridge Regression from a Bayesian Perspective, *Moscow Institute of Physics and Technology and Institute for information transmission problems of the Russian Academy of Sciences*, Moscow, Russia

2008 Entropies in On-line Learning: Generalised Entropies and Asymptotic Complexities of Languages, *School of Electronics and Computer science, University of Southampton*

Teaching Experience

I have taught the following complete courses:

- year 2: Operating Systems / Network Operating Systems;
- year 3: Computational Finance; Computer Learning.

I have also taught parts of the following courses:

- year 1: Introduction to programming and C++;
- year 2: Computer Graphics;
- MSc level: Information Systems Design.

Administrative Work

I had the following administrative roles at the department:

- undergraduate admissions tutor 2003–2005 and 2008–now; the director of admissions 2004–2005 and since 2010;
- the director of graduate studies 2005–2008.