
Phone: (+44) (0) 7594 099074
E-mail: o.rivasplata@cs.ucl.ac.uk

DeepMind, Foundations Team
University College London, Centre for AI

AREAS OF INTEREST

Foundations of Artificial Intelligence. Machine Learning. Probability and Statistics.

EDUCATION

- 2012 **PhD in Mathematics**, University of Alberta, Canada.
- 2005 **MSc in Mathematics**, University of Alberta, Canada.
- 2002 **Título in Mathematics**, Pontificia Universidad Católica del Perú.
- 2001 **BSc in Mathematics**, Pontificia Universidad Católica del Perú.

ACADEMIC HONORS AND AWARDS

- DeepMind Sponsored Scholarship, UCL 2017 - 2021.
- Queen Elizabeth II Graduate Scholarship, University of Alberta, 2016.
- J.M. Mitchell Graduate Scholarship, University of Alberta, December 2009.
- Marie Curie Fellowship as Early Stage Researcher, sponsored by the RTN European Network: Phenomena in High Dimensions, March 1 - May 30, 2008.
- J.M. Mitchell Graduate Scholarship, University of Alberta, December 2007.
- Provost Doctoral Entrance Award, University of Alberta, 2006. Renewed 2007.
- J.M. Mitchell Graduate Scholarship, University of Alberta, November 2004.
- Eoin L. Whitney Scholarship, University of Alberta, June 2003.
- Graduate Teaching Assistantship Scholarship, University of Alberta, 2002.

PAPERS

1. O. Rivasplata, I. Kuzborskij, C. Szepesvari, and J. Shawe-Taylor. PAC-Bayes Analysis Beyond the Usual Bounds. To appear in NeurIPS 2020.
2. L. Orseau, M. Hutter, and O. Rivasplata. Logarithmic pruning is all you need. To appear in NeurIPS 2020.
3. O. Rivasplata, I. Kuzborskij, C. Szepesvari, and J. Shawe-Taylor. PAC-Bayes Analysis Beyond the Usual Bounds. NeurIPS 2019 Workshop on Machine Learning with Guarantees.
4. O. Rivasplata, E. Parrado-Henandez, J. Shawe-Taylor, S. Sun, and C. Szepesvari. PAC-Bayes bounds for stable algorithms with instance-dependent priors. *Advances in Neural Information Processing Systems* (2018), 9214-9224.

5. O. Rivasplata and A.E. Litvak. Smallest singular value of sparse random matrices. *Studia Mathematica*, **212**, 3 (2012), 195-218.
6. O. Rivasplata. Subgaussian random variables: An expository note. *Unpublished*.
7. O. Rivasplata, J. Rychtar, and B. Schmuland. Reversibility for diffusions via quasi-invariance *Acta Univ. Carolin. Math. Phys.*, **48**, 1 (2007), 3-10.
8. O. Rivasplata, J. Rychtar, and C. Sykes. Evolutionary games in finite populations. *Pro Mathematica*, **20**, 39/40 (2006), 147-164.
9. O. Rivasplata and B. Schmuland. Invariant and reversible measures for random walks on \mathbb{Z} . *Pro Mathematica*, **19**, 37/38 (2005), 117-124.

THESES

1. Smallest singular value of sparse random matrices. *Doctoral dissertation*, Mathematics, University of Alberta, 2012.
2. Characterizations of reversibility for certain classes of finite and infinite dimensional diffusions. *Master Thesis*, Mathematics, University of Alberta, 2005.
3. On repeated games with incomplete information (in Spanish). *Undergraduate Thesis*, Mathematics, Pontificia Universidad Católica del Perú, 2002.

TUTORIALS

- Statistical Learning Theory: A Hitchhiker's Guide. At NeurIPS 2018. Jointly with J. Shawe-Taylor. Slides and video available in the conference website.

TALKS & POSTERS

- Tighter risk certificates for (probabilistic) neural networks. Oxford University, Statistics Department, October 28, 2020. Virtual talk, with M. Pérez-Ortiz.
- Tighter risk certificates for (probabilistic) neural networks. The Mathematical Institute for Data Science (MINDS), Johns Hopkins University, September 04, 2020. Virtual talk, with M. Pérez-Ortiz.
- Tighter risk certificates for (probabilistic) neural networks. UKRI Centre for Doctoral Training in Foundational AI, July 01, 2020. Virtual talk.
- (Poster) PAC-Bayes Analysis Beyond the Usual Bounds. The Alan Turing Institute, June 02, 2020. Virtual poster session.
- PAC-Bayes with Backprop: Tighter risk certificates for neural networks. Data-centric Engineering Reading Group, Alan Turing Institute. April 29, 2020. Virtual talk.
- Pruning untrained neural networks (paper by S. Hayou (2020)). DeepMind Foundations, Neural Networks Readathon. April 21, 2020. Virtual talk.

- Generalisation beyond the interpolation threshold. UCL/Surrey Meeting, MURI project. April 6, 2020. Virtual talk.
- (Poster) PAC-Bayes Analysis Beyond the Usual Bounds. NeurIPS 2019 Workshop on Machine Learning with Guarantees. December 14, 2019.
- (Poster) PAC-Bayes bounds for stable algorithms with distribution-dependent priors. MURI Show & Tell, DSTL Portsmouth West. April 30, 2019.
- (Poster) PAC-Bayes bounds for stable algorithms with instance-dependent priors. NeurIPS 2018. December 05, 2018.
- PAC-Bayes bounds for stable algorithms with instance-dependent priors. The MURI Annual Meeting, Imperial College London, October 11, 2018.
- (Poster) PAC-Bayes bounds for stable algorithms with distribution-dependent priors. MURI Show & Tell, DSTL Porton Down. June 28, 2018.
- A PAC-Bayes bound for Hilbert space valued algorithms. Theory Seminar, DeepMind, June 05, 2018.
- Smallest Singular Value of Sparse Random Matrices. University of North Carolina at Greensboro, August 19, 2015.
- A Poincaré-type inequality due to Brascamp and Lieb, with an application to Thin Shells. Working Seminar of Functional Analysis, University of Alberta, Winter 2013.
- Smallest singular value of random matrices with subgaussian entries. Universidad Nacional de Trujillo, July 17, 2012.
- Hargé's work on a special case of the Gaussian correlation conjecture. Working Seminar of Functional Analysis, University of Alberta, Winter 2012.
- A characterization of n -dimensional Gaussian measures. Working Seminar of Functional Analysis, University of Alberta, Winter 2011.
- The smallest singular value of random matrices containing null entries. Invited talk at the Northwest Functional Analysis Seminar, Banff International Research Station, October 16 - 18, 2009.
- Smallest singular value of random matrices with subgaussian entries. Working Seminar of Functional Analysis, University of Alberta, Winter 2009.
- On the smallest singular value of a rectangular subgaussian matrix with some null entries. Invited talk at the Conferencia de Matemática y Estadística, Pontificia Universidad Católica del Perú, August 2008.
- (Poster) Smallest singular value of random matrices with some null entries. Educational workshop Probabilistic Methods in Geometry, Bedlewo, Poland, July 6 - 12, 2008
- Smallest singular value of random matrices. PIMS-CRG Workshop in Geometry and Harmonic Analysis, University of Calgary, February 9 - 10, 2008.
- Smallest singular value of random matrices. Working Seminar of Functional Analysis, University of Alberta, Winter 2007.

- Two characterizations of reversibility for Brownian motion with drift. Workshop in Probability and Analysis, Universidad Nacional Pedro Ruiz Gallo, Chiclayo, Perú, June 27 - 30, 2006.
- Reversibility of Finite-Dimensional Diffusions. Pontificia Universidad Católica del Perú, December 2004.

ATTENDED MEETINGS, WORKSHOPS & EVENTS

- International Conference in Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing (MCQMC), August 10 - 14, 2020.
- International Conference on Machine Learning (ICML), July 12 - 18, 2020.
- Conference on Learning Theory (COLT), July 9 - 12, 2020.
- Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, December 8 - 14, 2019.
- Conference on Neural Information Processing Systems (NeurIPS), Montreal, Canada, December 3 - 8, 2018.
- MURI Annual Meeting, Imperial College London, October 11, 2018.
- Conference on Geometric Functional Analysis, in Honour of Nicole Tomczak-Jaegermann, University of Alberta, May 16 - 20, 2016.
- Introduction to the Theory of Valuations and Convex Sets, CBMS Conference, Kent State University, August 10 - 14, 2015.
- Geometric Tomography and Harmonic Analysis, Banff International Research Station, March 10 - 14, 2014.
- 2013 Annual Meeting of the Signal Analysis and Imaging Group, University of Alberta - Calgary Centre, Calgary, December 9 - 10, 2013.
- Convexity and probability in high dimensions, Winter School at Institut Henri Poincaré, Paris, January 7 - 11, 2013
- Northwest Functional Analysis Symposium, Banff International Research Station, March 31 - April 1, 2012.
- Harmonic Analysis in Convex Geometry, Banff International Research Station, May 16 - 20, 2011.
- Concentration Week on Probability in Asymptotic Geometry, Texas A & M University, July 20 - 24, 2009.
- Summer Graduate Workshop on Random Matrix Theory, Mathematical Sciences Research Institute, Berkeley, California, July 6 - 17, 2009.
- Affine Convex Geometric Analysis, Banff International Research Station, January 11 - 16, 2009.
- Symposium on geometry of Banach spaces, in memory of Prof. Lior Tzafriri, The Hebrew University of Jerusalem, May 27 - 28, 2008.

- Workshop in Analysis and Probability & Summer Informal Regional Functional Analysis Seminar, Texas A & M University, July 31 - August 12, 2007.
- Third Northwest Functional Analysis Symposium, Banff International Research Station, March 30 - April 1, 2007.
- PIMS Graduate Students Workshop, University of Alberta, March 3 - 4, 2007.
- Probabilistic and Combinatorial Approach in Analysis, CBMS Conference, Kent State University, August 6 - 12, 2006.
- Analytic and Geometric Aspects of Stochastic Processes, Banff International Research Station, April 10 - 15, 2004.
- Dirichlet Forms and Related Stochastic Analysis, LMS Invited Lecture Series, University of Wales Swansea, 24 - 30 August 2003.

VISITS

Weizmann Institute of Science, Israel, March 1 - May 30, 2008. Visiting Student.

STUDENT SUPERVISION

Matthew Halma (co-supervised with Mauricio Sacchi), Undergraduate Research Student, Department of Physics, University of Alberta, Summer 2014. Project: Image Recovery via Compressive Sensing with Sparsifying DCT and DFT Transforms.

REVIEWING SERVICE

- JMLR: Journal of Machine Learning Research. (Editorial Board Reviewer)
- IMA IAI: Information and Inference: A Journal of the IMA. (Reviewer)
- COLT: Conference on Learning Theory. (Reviewer)
- ICML: International Conference on Machine Learning. (Reviewer)
- NeurIPS: Conference on Neural Information Processing Systems. (Reviewer)
- ALT: International Conference on Algorithmic Learning Theory. (Reviewer)
- AISTATS: Conference on Artificial Intelligence and Statistics. (Reviewer)
- AAAI: Conference on Artificial Intelligence. (Reviewer)
- JSTP: Journal of Statistical Theory and Practice. (Reviewer)
- Explorations: The Journal of Undergraduate Research and Creative Activities for the State of North Carolina. (Reviewer)

OUTREACH & VOLUNTEERING

- Volunteer mentor for DeepMind Scholars Interview Skills Day. February 21, 2020. Aimed to enable students from diversity groups with skills for a job interview.

- Chair for the Computer Science Mini Conference, which hosted five 25 min talks by graduate students. University College London, May 03, 2019.
- Volunteer and Instructor at the CMS Summer Camp for Junior High students, University of Alberta, July 2016. Run a Probability Problem-Solving Session.
- Volunteer Instructor, Edmonton Math Kangaroo Club, January - March 2010. Run math problem-solving sessions for children in grades 3 to 6.
- Founder and coordinator of the graduate students' seminar, Mathematical and Statistical Sciences, University of Alberta, January 2004 – October 2005.

SOME EXTRACURRICULAR ACTIVITIES

- Volunteer Assistant Instructor for Kodokwai Judo Club, 2014 - 2017.
- Volunteer Coach for Community League Soccer, throughout various seasons.

MEMBERSHIPS

Member of the Institute of Mathematical Statistics since March 2004.

Member of the American Mathematical Society since January 2004.

EMPLOYMENT

Research Scientist Intern, Foundations Team, DeepMind	2018 - today
Research Student, Computer Science, University College London	2017 - today
Research Assistant, Computing Science, University of Alberta	2016 - 2017
Sessional Lecturer, University of Alberta	2015 - 2016
Sessional Lecturer, Concordia University of Edmonton	2009 - 2015
Sessional Lecturer, University of Alberta	2005 - 2013
Research Assistant, Math & Stats, University of Alberta	2006 - 2007
Sessional Lecturer, Pontificia Universidad Católica del Perú	2006
Graduate Teaching Assistant, University of Alberta	2002 - 2005
Sessional Lecturer, Pontificia Universidad Católica del Perú	2001 - 2002
Teaching Assistant, Pontificia Universidad Católica del Perú	1999 - 2002

COMPUTER SKILLS

Programming: Python.

Mathematical Software: Matlab, Octave.

Statistical Software: R (environment for statistical computing and graphics).

Operating Systems: Linux, Mac OS X, Microsoft Windows.

Productivity: LibreOffice, Microsoft Office, L^AT_EX.

LANGUAGES

Spanish (first language), English (very high proficiency), French (working on it).

REFERENCES

jst@cs.ucl.ac.uk JOHN SHAWE-TAYLOR
University College London

szepesva@ualberta.ca CSABA SZEPESVARI
DeepMind / University of Alberta

alitvak@ualberta.ca ALEXANDER LITVAK
University of Alberta

Last updated: November 9, 2020