Curriculum Vitae **Omar Rivasplata**

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Mathematics / Computer Science
University College London

AREAS OF INTEREST

Machine Learning. Artificial Intelligence. Mathematics. 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, University College London, 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 IN CONFERENCES & JOURNALS

1. I. Kuzborskij, C. Szepesvári, O. Rivasplata, Amal Rannen-Triki, and Razvan Pascanu. On the Role of Optimization in Double Descent: A Least Squares Study. To appear in NeurIPS 2021.
2. M. Pérez-Ortiz, O. Rivasplata, C. Szepesvári, and J. Shawe-Taylor. Tighter risk certificates for neural networks. *JMLR*, **22**, 227 (2021).
3. M. Haddouche, B. Guedj, O. Rivasplata, J. Shawe-Taylor. PAC-Bayes unleashed: generalisation bounds with unbounded losses. *Entropy*, **23**, 10 (2021).
4. O. Rivasplata, I. Kuzborskij, C. Szepesvári, and J. Shawe-Taylor. PAC-Bayes Analysis Beyond the Usual Bounds. In *Neural Information Processing Systems [NeurIPS]* 2020.

5. L. Orseau, M. Hutter, and O. Rivasplata. Logarithmic pruning is all you need. In *Neural Information Processing Systems [NeurIPS]* 2020.
6. O. Rivasplata, E. Parrado-Henández, J. Shawe-Taylor, S. Sun, and C. Szepesvári. PAC-Bayes bounds for stable algorithms with instance-dependent priors. In *Neural Information Processing Systems [NeurIPS]* 2018.
7. A.E. Litvak and O. Rivasplata. Smallest singular value of sparse random matrices. *Studia Mathematica*, **212**, 3 (2012), 195-218.
8. O. Rivasplata, J. Rychtar, and B. Schmuland. Reversibility for diffusions via quasi-invariance *Acta Univ. Carolin. Math. Phys.*, **48**, 1 (2007), 3-10.
9. O. Rivasplata, J. Rychtar, and C. Sykes. Evolutionary games in finite populations. *Pro Mathematica*, **20**, 39/40 (2006), 147-164.
10. O. Rivasplata and B. Schmuland. Invariant and reversible measures for random walks on $\mathbb{Z}$. *Pro Mathematica*, **19**, 37/38 (2005), 117-124.

WORKSHOP PAPERS

1. M. Pérez-Ortiz, O. Rivasplata, E. Parrado-Henández, B. Guedj, J. Shawe-Taylor. Progress in Self-Certified Neural Networks. To be presented at the NeurIPS 2021 Workshop – Bayesian Deep Learning.
2. A. Grabska-Barwińska, A. Rannen-Triki, O. Rivasplata, A. György. Towards better visual explanations for deep image classifiers. To be presented at the NeurIPS 2021 Workshop – eXplainable AI for debugging and diagnosis.
3. M. Pérez-Ortiz, O. Rivasplata, C. Szepesvári, and J. Shawe-Taylor. Towards self-certified learning: Probabilistic neural networks trained by PAC-Bayes with Backprop. NeurIPS 2020 Workshop – Beyond BackPropagation.
4. O. Rivasplata, I. Kuzborskij, C. Szepesvári, and J. Shawe-Taylor. PAC-Bayes Analysis Beyond the Usual Bounds. NeurIPS 2019 Workshop – Machine Learning with Guarantees.

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

- PAC-Bayes Analysis Beyond the Usual Bounds. Imperial College London, Statistics Section. June 11, 2021. Virtual talk.
- PAC-Bayes Analysis Beyond the Usual Bounds. University of Copenhagen, May 10, 2021. Virtual talk.
- 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 Portsdown 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.
- 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.
- Harge'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.

- Smallest singular value of random matrices containing null entries. 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.
- (Poster) Smallest singular value of random matrices with some null entries. 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.
- Reversibility of Finite-Dimensinal Diffusions. Pontificia Universidad Católica del Perú, December 2004.

ATTENDED CONFERENCES, WORKSHOPS & EVENTS

- International Conference on Machine Learning (ICML), July 18 - 24, 2021.
- International Conference on Artificial Intelligence and Statistics (AISTATS), April 13 - 15, 2021.
- Conference on Algorithmic Learning Theory (ALT), March 16 - 19, 2021.
- Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, December 6 - 12, 2020.
- 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.
- 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.
- 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.
- 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.

EMPLOYMENT

Research Associate, Mathematics, University College London	2021
Research Scholar, DeepMind	2018 - 2021
Research Scholar, Computer Science, University College London	2017 - 2021
Research Assistant, Computing Science, University of Alberta	2016 - 2017
Sessional Lecturer, University of Alberta	2015 - 2016
Postdoctoral Fellow, Physics, University of Alberta	2013 - 2015
Postdoctoral Fellow, Math & Stats, University of Alberta	2012 - 2013
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

REVIEWING SERVICE

- Journal of Machine Learning Research. (Editorial Board Reviewer)
- Information and Inference: A Journal of the IMA. (Reviewer)
- Machine Learning Journal. (Reviewer)
- IEEE Transactions on Neural Networks and Learning Systems. (Reviewer)
- IEEE Transactions on Pattern Analysis and Machine Intelligence. (Reviewer)
- COLT: Conference on Learning Theory. (Program Committee Member)
- ICML: International Conference on Machine Learning. (Reviewer)
- NeurIPS: Conference on Neural Information Processing Systems. (Reviewer)
- ALT: International Conference on Algorithmic Learning Theory. (Sub-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)

SOME EXTRACURRICULAR ACTIVITIES

- Spectator of concerts organized by the Edmonton Classical Guitar Society.
- Volunteer Assistant Instructor for Kodokwai Judo Club, 2014 - 2017.
- Volunteer Coach for Community League Soccer, throughout various seasons.

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.

STUDENT SUPERVISION

- Supervised thesis projects for MSc students of the Machine Learning programme, Department of Computer Science, University College London, Summer 2021.
- Supervised an Undergraduate Research Student project, Department of Physics, University of Alberta, Summer 2014.

VISITS

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

MEMBERSHIPS

European Laboratory for Learning and Intelligent Systems (ELLIS).
Institute of Mathematical Statistics.
American Mathematical Society.

COMPUTER SKILLS

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, LaTeX.

LANGUAGES

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

REFERENCES

razp@deepmind.com — Razvan Pascanu, DeepMind

j.shawe-taylor@ucl.ac.uk — John Shawe-Taylor, University College London

alitvak@ualberta.ca — Alexander Litvak, University of Alberta

Last updated: November 10, 2021