

Azadeh Khaleghi

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CURRENT/PAST POSITIONS

- **2015 – present:** Assistant Professor, Department of Mathematics & Statistics, Lancaster University, UK
- **2013 – 2015:** Postdoctoral Scholar, Mines ParisTech/Institut Curie, Paris, France
- **2013:** Graduate Research Intern, Walt Disney Animation Studios, Burbank, CA, USA

EDUCATION & QUALIFICATIONS

- **2010 – 2013:** Ph.D. Mathematics, Université de Lille I & INRIA, Lille, France
- **2007 – 2009:** MSc. Electrical & Computer Engineering, University of Toronto, Toronto, Canada
- **2003 – 2007:** BSc. Electrical & Computer Engineering, University of Toronto, Toronto, Canada
- **2016:** UK Full PG Teaching Qualification - Postgraduate Certificate in Academic Practice (PG-CAP I-II)

AWARDS, FELLOWSHIPS & SCHOLARSHIPS

- **2019/20:** Google Faculty Research Award in Machine Learning & Data Mining, USD 58000
- **2019/20:** Lancaster University Department of Mathematics & Statistics Tower of Teaching Award for Teaching Excellence Nomination
- **2019:** London Mathematical Society (LMS) Scheme 4 Grant, £1000
- **2018:** London Mathematical Society (LMS) Scheme 1 Grant, £5335
- **2018:** Visiting Fellowship of the Isaac Newton Institute at for Mathematical Sciences to participate in the programme “Statistical Scalability” at Cambridge University, Cambridge, UK
- **2017:** Adobe Research Funding, USD 15000
- **2017:** London Mathematical Society (LMS) Scheme 1 Grant, £600
- **2013:** E. M. Gold Award for the best paper at the ALT International Conference
- **2013:** PhD at INRIA - Université de Lille I with distinction (mention “très honorable”)
- **2010:** INRIA Doctoral Scholarship to fund PhD Studies (2010 - 2013)
- **2007 – 2009:** University of Toronto MSc Research Fellowship
- **2006, 2007:** NSERC Undergraduate Research Award & University of Toronto’s Faculty Undergraduate Research Award

SELECTED PUBLICATIONS & PREPRINTS

- [1] A. Khaleghi, G. Lugosi, Inferring the mixing properties of an ergodic process, arXiv:2106.07054.
- [2] S. Grünewälder, A. Khaleghi, Oblivious Data for Fairness with Kernels, Journal of Machine Learning Research, (208): 1-36, 2021.
- Remark.** This work was featured at the ELLIS workshop on the Foundations of Algorithmic Fairness, 2021.
- [3] A. Khaleghi, D. Ryabko, Clustering piecewise stationary processes, In Proceedings of the IEEE International Symposium on Information Theory, 2020.
- [4] S. Grünewälder, A. Khaleghi, Approximations of the Restless Bandit Problem, Journal of Machine Learning Research, 20:1-37, 2019.
- [5] S. Grünewälder, A. Khaleghi, Oblivious Data, In Proceedings of the International Conference on Neural Information Processing Systems (NeurIPS) workshop on Human-Centric Machine Learning, 2019.
- [6] A. Khaleghi, D. Ryabko, J. Mary, P. Preux, Consistent Algorithms for Clustering Time Series, Journal of Machine Learning Research, 17(3):1-32, 2016.
- [7] A. Khaleghi, D. Ryabko, Nonparametric Multiple Change Point Estimation in Highly Dependent Time Series, Theoretical Computer Science, 620:119-133, 2016.
- Remark.** A shorter version of this paper received the E. M. Gold Award for the best paper at the 24th International Conference on Algorithmic Learning Theory (ALT) 2013.
- [8] A. Khaleghi, D. Ryabko, Asymptotically Consistent Estimation of the Number of Change Points in Highly Dependent Time Series, In Proceedings of the International Conference on Machine Learning, 2014.
- [9] A. Khaleghi, D. Ryabko, Locating Changes in Highly-Dependent Data with an Unknown Number of Change-Points, In Proceedings of Neural Information Processing Systems, 2012.
- [10] A. Khaleghi, D. Ryabko, J. Mary, P. Preux, Online Clustering of Processes, In Proceedings of Artificial Intelligence & Statistics, 2012.
- [11] A. Khaleghi, D. Silva, F. R. Kschischang, Subspace Codes, Lecture Notes in Computer Science, 2009.
- [12] A. Khaleghi, F. R. Kschischang, Projective Space Codes for the Injection Metric, In Proceedings of the Canadian Workshop on Information Theory 2009.

SOFTWARE

- **RChest & PyChest:** an R (respectively Python) package available on CRAN (respectively on PyPI) for locating distributional changes in piece-wise stationary time series with long-range dependencies, 2021.
 - **Corresponding Paper:** A. Khaleghi, L. Zierahn, PyChEst: a Python package for the consistent retrospective estimation of distributional changes in piece-wise stationary time series, arXiv:2112.10565. Submitted to the Journal of Statistical Software (JSS)
- **Oblivious:** a Github repository containing a Python implementation of our “Algorithmically Fair” classification and regression methods, 2021.
 - **Corresponding Paper:** Methods implemented are based on [2].

COLLABORATIVE RESEARCH VISITS

- **Feb – Mar 2020:** Gabor Lugosi, Department of Economics, Pompeu Fabra University, Barcelona, Spain
- **Sep 2018:** Facebook Research, Paris, France
- **Feb – Mar 2018:** Statistical Scalability Programme, Isaac Newton Institute for Mathematical Sciences, Cambridge University, Cambridge, UK
- **Nov – Dec 2017:** Adobe Research, San Jose, California, USA

INVITED CONFERENCE & SEMINAR PRESENTATIONS

- **Jan 2022:** Centre de Mathématiques Appliquées (CMAP), École Polytechnique, Paris, France (online)
- **Nov 2021:** London School of Economics (LSE), Department of Statistics, London, UK (online)
- **Nov 2021:** Algorithms & Computationally Intensive Inference Seminars, University of Warwick, Department of Statistics, Coventry, UK
- **Mar 2021:** Special Interest Group on Machine Learning and Dynamical Systems, Alan Turing Institute, London, UK (online)
- **Sep 2020:** Symposium on Machine Learning and Dynamical Systems, Fields Institute for Research in Mathematical Sciences, Toronto, Canada (online)
- **Feb 2020:** Pompeu Fabra University, Department of Economics, Barcelona, Spain
- **Sep 2019:** Data, Learning and Inference (DALI) Meeting, San Sebastian, Spain
- **Mar 2019:** Université Paris-Nanterre, Laboratoire Modal'X, Paris, France
- **Apr 2018:** Isaac Newton Institute (INI) for Mathematical Sciences, Workshop on Big Data challenges: heterogeneity, model misspecification and changepoints, Windermere, UK
- **Feb 2018:** University of Cambridge, Statistical Laboratory, Cambridge, UK
- **Feb 2018:** University of Warwick, Department of Statistics, Coventry, UK
- **Dec 2017:** Amazon Music, San Francisco, California, USA
- **Jul 2017:** International Statistical Institute (ISI) 61st World Statistics Congress, Marrakech, Morocco
- **Apr 2017:** Adobe Research, San Jose, California, USA
- **Mar 2017:** University of Bristol, School of Mathematics, Bristol, UK
- **Sep 2016:** Royal Statistical Society (RSS) Conference, Manchester, UK
- **Mar 2014:** Ergodic Theory and Dynamical Systems Workshop, UNC Chapel Hill, North Carolina, USA

CONTRIBUTED CONFERENCE & WORKSHOP PRESENTATIONS

- **Jun 2020:** IEEE International Symposium on Information Theory, Los Angeles, California, USA (online)
- **Dec 2019:** Human-Centric Machine Learning Workshop at the International Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada
- **Dec 2016:** European Workshop on Reinforcement Learning (EWRL), Barcelona, Spain
- **Jun 2014:** International Conference on Machine Learning (ICML), Beijing, China
- **Oct 2013:** International Conference on Algorithmic Learning Theory (ALT), Singapore, Singapore
- **Dec 2012:** International Conference on Neural Information Processing Systems (NeurIPS), Lake Tahoe, Nevada, USA
- **Apr 2012:** International Conference on Artificial Intelligence & Statistics (AI&Stats), La Palma, Canary Islands

POSTGRADUATE SUPERVISION/EXAMINATION

- **Oct 2021 – present:** Co-Supervisor of PhD student Daniel Hodgson, funded by EPSRC Mathematical Sciences PhD studentship (jointly with Amanda Turner), Lancaster University, UK.
- **Oct 2020 – present:** Supervisor of PhD student Ali Arabzadeh, funded by EPSRC Mathematical Sciences PhD studentship, Lancaster University, UK.
- **Oct 2020 – present:** Co-Supervisor of PhD student Moe Kuchemann-Scales, funded by the Mathematics & Statistics Department (jointly with Gordon Blower), Lancaster University, UK.
- **Oct 2020:** Internal Examiner of PhD student Alexander Fisch
- **Feb 2019:** Internal Examiner of PhD student Ciara Pike-Burke
- **2019 – present:** Chair of Higher Degree Committee (HDC) for PhD student Keerati Suibkitwanchai, Lancaster University, UK.
- **2017 – 2019:** Supervisor of MPhil student Dimitri Zografos, funded by the Mathematics & Statistics Department, Lancaster University, UK.
- **Mar 2016:** Internal Examiner of PhD student Benjamin James Pickering
- **2015 – 2019:** Chair of Higher Degree Committee (HDC) for PhD student Benjamin Norwood, Lancaster University, UK.

WORKSHOP ORGANIZATION

- **Sep 2019:** *Multi Armed Bandits*, at Imperial College, London, UK
- **May 2018:** *Lancaster Probability Days*, at Lancaster University, Lancaster, UK
- **Dec 2017:** *NeurIPS 2017 Time-Series Workshop*, at the International Conference on Neural Information Processing Systems (NeurIPS), California, USA
- **Mar 2017:** *Statistical Learning Workshop*, at Lancaster University, Lancaster, UK
- **Dec 2016:** *NeurIPS 2016 Time-Series Workshop*, at the International Conference on Neural Information Processing Systems (NeurIPS), Barcelona, Spain
- **Dec 2015:** *NeurIPS 2015 Time-Series Workshop*, at the International Conference on Neural Information Processing Systems (NeurIPS), Montreal, Canada

REFEREEING & INTERVIEW PANEL PARTICIPATION

- **Reviewer for the following Journals & International Conference Proceedings:** ESAIM: Probability & Statistics, Journal of Machine Learning Research (JMLR), Journal of Statistical Theory and Practice, International Conference on Machine Learning (ICML), Conference on Learning Theory (COLT), Advances in Neural Information Processing Systems (NeurIPS), Artificial Intelligence & Statistics Conference (AI&Stats), IEEE International Symposium on Information Theory (ISIT)
- **Area Chair:** Women in Machine Learning (WiML) Conference
- **External Reviewer:** for a Research Foundation Flanders (FWO) Research Project proposal, 2020
- **External Reviewer:** for a Research Foundation Flanders (FWO) Research Project proposal, 2021
- **1 of 3 Interview Panel Members:** for the recruitment of a STOR-i Impact Research Associate, 2019.
- **1 of 3 Interview Panel Members:** for the recruitment of a Research Associate in Pure Mathematics, 2019.

TEACHING

- **Machine Learning (MATH336):** Lancaster University 2016 – present
 - Designed and introduced the module as a new addition to the curriculum.
 - Topics: Mathematical Foundations of Machine Learning, the theory of generalization and feasibility of learning, probabilistic framework for learning, Bayes optimal predictor, empirical risk minimization, VC-theory, kNNs, Perceptrons, Neural Networks, SVMs, bias-complexity trade-off and model selection, as well as R programming for ML.
- **Probability & Stochastic Processes (STOR602ii):** Lancaster University, 2019
 - Designed and introduced this module to replace the previous version of the course and better address the academic needs of our PhD students in Statistics & Operations Research at the STOR-i Doctoral Training Center.
 - Topics: A gentle introduction to measure-theoretic probability with a focus on Kolmogorov conditional expectation & Radon Nykodym theorem, and Martingales.
- **Financial Stochastic Processes (MATH580):** Lancaster University, 2015 – 2018, 2020 – present
 - Introduction to probability & stochastic processes for the MSc Financial Mathematics programme.
- **Project Skills (MATH390/MATH240):** Lancaster University, 2015 – present
 - Design and supervise individual and group projects in Machine Learning and Statistics for second and third-year Mathematics & Statistics students.
- **MSc/MSci Project Design & Supervision:** Lancaster University, 2015 – present
 - Design and supervise MSc/MSci projects in Machine Learning, Data Science and Statistics
- **Reconnaissance des formes:** Université de Lille I, 2012 – 2013

ACADEMIC LEADERSHIP & ENGAGEMENT

- **2020 – present: Director of Non-FST Undergraduate Studies**
 - Monitor academic performance and engagement of, and coordinate exams for, all students on combined-degree programmes with departments beyond the Faculty of Science and Technology, and serve as an active member of the Undergraduate Teaching Committee, Examinations Committee and Exceptional Circumstances Committee.
- **2020 – present: APTS Executive Committee Member**
 - Contribute to the management, direction and curriculum design of the Academy for PhD Training in Statistics (APTS), a collaboration between major UK statistics research groups to organize training weeks for first-year PhD students in statistics and applied probability nationally.
- **2018 – 2020: APTS Advisory Committee Member**
 - Represented Lancaster University on APTS, and helped advise the APTS Executive Committee on all matters relating to the direction and organisation of the academy.
 - In this capacity, I led a successful (£25K) bid for Lancaster University to host a 2021 “APTS Week”: a Summer School for first-year statistics and applied probability PhD students.
- **2015 – 2020: Early Career Research Representative**
 - Represent early career staff at the Department’s Research Committee meetings.

■ **2015 – present:** Lancaster University Open Day Representative

- Represent the Department at Undergraduate Open Days to increase awareness around women's achievements in mathematical sciences and to encourage young scientists, especially women and minority groups to consider careers in mathematics.

■ **2019 – present:** International Teaching Partnership (ITP) Moderator

- Moderate examination papers in statistics for various degrees in engineering and science at Lancaster University's partner institutes. This involves checking and approving examination papers, inspecting marked scripts, as well as quality assurance and enhancement.

■ **2019 – present:** Equality & Diversity Committee Member

- Contribute to the Department's policies on actively promoting equal opportunities, as well as high-quality and inclusive learning and working experiences for all, and ensuring appropriate procedures for fairness in assessment and treatment.

■ **2018 – 2019:** Postgraduate Research Tutor

- Contributed to decisions on PhD admissions, coordinated the regular progress reviews of PhD students, and monitored the results of the 1-year confirmation panels.

■ **2017 - 2019:** Head of Computing Committee

- Represented the Department at the Faculty of Science and Technology on computing policies and objectives.

OUTREACH ACTIVITIES

- **Women in Machine Learning Theory (WiML-T) Mentor (2020 - present):** Helping young women and non-binary researchers interested in theoretical ML to overcome obstacles in reaching their academic career goals.

- **Lancaster University Associate Teacher Programme Mentor (2019 - 2020):** Helping Graduate Teaching Assistants gain access to new teaching possibilities through peer-observation and shadowing opportunities.

OTHER SKILLS

■ **Programming**

Python, Matlab, R, C/C++, Java

■ **Languages**

■ **English:** Native ■ **French:** Fluent

■ **Music**

■ **Classical Piano:** Able to play at Canada's RCM Gr-10 Standard