Ricardo Silva

CONTACT INFORMATION

Department of Statistical Science
University College London
Gower Street, London WC1E 6BT, UK

Phone: +44 (0)20 7679 1879
E-mail: ricardo@stats.ucl.ac.uk
WWW: http://www.homepages.ucl.ac.uk/~ucgtrbd

RESEARCH INTERESTS

graphical models, causal inference, Bayesian inference, computational statistics, relational inference.

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Ph.D., Machine Learning Department, August 2005

- Dissertation Topic: "Automatic Discovery of Latent Variable Models"
- Committee: Richard Scheines, Clark Glymour, Tom Mitchell, Greg Cooper

M.Sc., Knowledge Discovery and Data Mining, May 2002

Universidade Federal de Pernambuco, Brazil

M.Sc., Computer Science, January 2000

Universidade Federal do Ceará, Brazil

B.Sc., Computer Science, December 1997

FUNDING AWARDS

Office of Naval Research, "Robust Factorial Causal Predictions with Observational and Interventional Data", 2019-2021 (awarded).

Centre de Recherches Mathématiques, travel funding for the short thematic program, "Statistical Causal Inference and Applications to Genetics", Summer 2016. Total amount CAD $1,600.00.

Adobe Research's University Collaborations Program, 2016. Total amount $5,000.00.

Innovate UK Knowledge Transfer Partnership (joint with Stratagem Inc), 2016. Total amount £108,755.00.

UCL Research Catalyst Awards (joint with Dr Soong M Kang, UCL School of Management), 2016. Total amount £2,700.00.

EPSRC Grant EP/N020723/1 "Nodes from the Underground: Causal and Probabilistic Approaches for Complex Transportation Networks", PI (Co-I: Dr Soong M Kang, UCL School of Management), 2016. Total amount £394,903.00.

EPSRC Grant EP/J013293/1 "Learning Highly Structured Sparse Latent Variable Models", First Grant Scheme. Total amount £99,532.00

Winton Research Award, 2011-2012. Total amount of £5,000.00

EPSRC Grant, "Graphical models for Relational Data: New Challenges and Solutions" (jointly with Prof. Zoubin Ghahramani, University of Cambridge), 2007. Total amount £190,576.00

Siebel Scholar, 2005

Microsoft Fellowship for M.Sc.-level research in knowledge discovery and data mining, 2000

CNPq scholarship for graduate (M.Sc.) research, Brazil, 1998-2000

CAPES (Programa Especial de Treinamento/Special Training Program) scholarship for undergraduate research, Brazil, 1995-1997

Academic Experience

The Alan Turing Institute

Faculty Fellow **2016-**

Department of Statistical Science, University College London, UK

Associat professor **2008-**
Research in graphical models, causality and computational statistics. Lectures in introductory statistical courses, computational statistics and optimisation for operations research.

Statistical Laboratory, University of Cambridge, UK

Postdoctoral research associate **2007-2008**
Research on Markov Chain Monte Carlo methods for new classes of multivariate models. Supervisor for the 2007 Lent Part IIC Statistical Modelling course.

Gatsby Computational Neuroscience Unit, University College London, UK

Senior Research Fellow **2005-2007**
Research on graphical models and Bayesian inference. Participating on journal clubs and presenting series of talks on relevant research topics of interest. Organizer of the Machine Learning Journal Club.

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Teaching assistant **2003, 2004**
Duties at various times have included office hours, recitation sessions, and guest lectures (Machine Learning M.Sc. course with Roni Rosenfeld, and Statistical Approaches for Learning and Discovery Ph.D. course, with John Lafferty, Larry Wasserman and Teddy Seidenfeld).

Universidade Federal do Ceará, Fortaleza, Brazil

Teaching faculty, Computer Science Department **Feb.-July 2000**
Taught undergraduate courses on computer science fundamentals and programming languages.

Publications

Kilbertus, N.; Ball, P.; Kusner, M.; Weller, A. and Silva, R. (2019). "The Sensitivity of Counterfactual Fairness to Unmeasured Confounding". Proceedings of the 35th Conference on Uncertainty in Artificial Intelligence (UAI).

Kusner, M. ; Russell, C.; Loftus, J. and Silva, R. (2019). "Making Decisions that Reduce Discriminatory Impact". Proceedings of the 36th International Conference on Machine Learning (ICML), p. 3591-3600.

Whitaker, G.; Silva, R. and Edwards, D. (2018). "Visualizing a Team's Goal Chances in Soccer from Attacking Events: A Bayesian Inference Approach". Big Data 6 (4), 271-290.

Coutrot, A.; Silva, R.; Manley, E.; De Cothi, W.; Sami, S.; Bohbot, S. Wiener, J., Holscher, C.; Dalton, R.; Hornberger, M. and Spiers, H. (2018). "Global Determinants of Navigation Ability". Current Biology 28 (17), 2861-2866.

Ng, Y.; Colombo, N. and Silva, R. (2018). "Bayesian Semi-supervised Learning with Graph Gaussian Processes" Advances in Neural Information Processing Systems, 1683-1694.

Globerson, A. and Silva, R. (2018). *P*roceedings of the 34th Conference on Uncertainty in Artificial Intelligence. AUAI Press.

Silva, R. and Shimizu, S. (2017). "Learning instrumental variables with structural and non-Gaussianity assumptions". Journal of Machine Learning Research 18(120):1-49, 2017

Russell, C.; Silva, R.; Kusner, M. and Loftus C. (2017) "When Worlds Collide: Integrating Different Counterfactual Assumptions in Fairness". Advances in Neural Information Processing Systems (NIPS).

Kusner, M.; Lofus, C.; Russell, C. and Silva, R. (2017) "Counterfactual fairness". Advances in Neural Information Processing Systems (NIPS).

Colombo, N.; Silva, R. and Kang, S. M. (2017). "Tomography of the London Underground: a Scalable Model for Origin-Destination Data". Advances in Neural Information Processing Systems (NIPS).

Carmo, R.; Kang, S. M. and Silva, R. (2017). "Visualization of Topic-Sentiment Dynamics in Crowdfunding Projects". Sixteenth International Symposium on Intelligent Data Analysis (IDA 2017).

Eberhardt, F.; Bareinboim, E.; Maathuis, M.; Mooij, J. and Silva, R. eds. (2017). Proceedings of the UAI 2016 Workshop on Causation: Foundation to Application. Co-located with the 32st Conference on Uncertainty in Artificial Intelligence (UAI 2016). Jersey City, USA, June 29, 2016.

Silva, R. (2016). "Observational-interventional priors for dose-response learning". Advances in Neural Information Processing Systems (NIPS) 29, 1561–1569.

Ng, Y.-C. and Chilinski, P. and Silva, R. (2016). "Scaling factorial hidden Markov models: stochastic variational inference without messages". Advances in Neural Information Processing Systems (NIPS) 29, 4044–4052.

Eberhardt, F; Silva, R.; Mooij, J.; Maathuis, M. and Barenboim, E., eds. (2016). *Proceedings of the UAI 2016 Workshop on Causation: Foundation to Application.* CEUR Workshop Proceedings Series, to appear. Jersey City NJ, June 29, 2016.

Silva, R. (2016). "Discussion of Causal inference using invariant prediction: identification and confidence intervals by Peters, Buhlmann and Meinshausen." JRSS B, 78, 991–992.

Silva, R. and Evans, R. (2016). "Causal inference through a witness protection program." Journal of Machine Learning Research 17, 1–53.

Silva, R.; Shiptser, I.; Evans, R.; Peters, J. and Claassen, T., eds. (2015). *Proceedings of the UAI 2015 Workshop on Advances in Causal Inference.* CEUR Workshop Proceedings Series, ISSN 1613-0073. Amsterdam, The Netherlands, July 16, 2015.

Silva, R. and Kalaitzis, A. (2015). "Bayesian inference via projections." Statistics and Computing 25, 739–753.

Silva, R.; Kang, S. M. and Airoldi, E. M. (2015), "Predicting traffic volumes and estimating the effect of shocks in massive transportation systems." Proceedings fo the National Academy of Sciences,

112, 5643–5648.

Silva, R. (2015). "Bayesian inference for cumulative distribution fields". *Interdisciplinary Bayesian Statistics*, A. Polpo, F. Louzada, L. Rifo, J. Stern and M. Lauretto (eds.), Springer Proceedings in Mathematics & Statistics, 83–96, Springer.

Silva, R. and Evans. R. (2014). "Causal inference through a witnes protection program." Advances in Neural Information Processing Systems, 298–306.

Kalaitzis, A. and Silva, R. (2013). "Flexible sampling for the Gaussian copula extended rank likelihood model". Advances in Neural Information Processing Systems, 2517-2525.

Sanborn, A. and Silva, R. (2013). Constraining bridges between levels of analysis: a computational justification for Locally Bayesian Learning. Journal of Mathematical Psychology, 57, 94-106.

Silva, R. (2013). "A MCMC approach for learning the structure of Gaussian acyclic directed mixed graphs.". *Statistical Models for Data Analysis*, P. Giudici, S. Ingrassia and M. Vichi (eds.), 343-351. Springer.

Silva, R. (2012). "Latent composite likelihood learning for the structured canonical correlation model". Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence, UAI 2012.

Silva, R. (2011). "Thinning measurement models and questionnaire design". Advances in Neural Information Processing Systems 24, NIPS 2011.

Silva, R; Blundell, C. and Teh, Y.W. (2011). "Mixed cumulative distribution networks". Proceedings of the 14th International Conference on Artificial Intelligence and Statistics, AISTATS 2011.

Zhang, J. and Silva, R. (2011). Discussion of "Learning equivalence classes of acyclic models with latent and selection variables from multiple datasets with overlapping variables.". Proceedings of the 14th International Conference on Artificial Intelligence and Statistics, AISTATS 2011

Silva, R. and Gramacy, R. B. (2010). "Gaussian process structural equation models with latent variables". Proceedings of the 26th Conference on Uncertainty in Artificial Intelligence, UAI 2010.

Silva, R.; Heller, K.; Ghahramani, Z. and Airoldi, E. (2010). "Ranking relations using analogies in biological and information networks". Annals of Applied Statistics 4, 615-644.

Silva, R. (2010). "Measuring latent causal structure". *Causality in the Sciences*, P. McKay Illari, F. Russo and J. Williamson (eds.), pages 676-696. Oxford University Press.

Silva, R. (2010). "Causality". *Encyclopedia of Machine Learning*, Claude Sammut, ed. Springer.

Silva, R. and Ghahramani, Z. (2009). "The hidden life of latent variables: Bayesian learning with mixed graph models". Journal of Machine Learning Research 10, 1187-1238.

Sanborn, A. N. and Silva, R. (2009). "Belief propagation and locally Bayesian learning". 31st Annual Conference of the Cognitive Science Society.

Silva, R. and Gramacy, R. (2009). "MCMC methods for Bayesian mixtures of copulas". Artificial Intelligence and Statistics, AISTATS '09.

Silva, R. and Ghahramani, Z. (2009). "Factorial mixture of Gaussians and the marginal independence model". Artificial Intelligence and Statistics, AISTATS '09.

Silva, R.; Chu, W. and Ghahramani, Z. (2007). "Hidden common cause relations in relational learning". Proceedings of Neural Information Processing Systems, NIPS '07.

Silva, R.; Heller, K. and Ghahramani, Z. (2007). "Analogical reasoning with relational Bayesian sets". Proceedings of the Artificial Intelligence & Statistics Conference, AISTATS '07.

Silva, R. and Scheines, R. (2006). "Towards association rules with hidden variables". Proceedings of the 10th European Conference on Principles and Practice of Knowledge Discovery in Databases, PKDD '06

Silva, R. and Ghahramani, Z. (2006). "Bayesian inference for Gaussian mixed graph models". Proceedings of the 22nd Conference on Uncertainty in Artificial Intelligence, UAI '06

Silva, R. and Scheines, R. (2006). "Bayesian learning of measurement and structural models". Proceedings of the International Conference on Machine Learning, ICML '06

Silva, R; Scheines, R.; Glymour, C and Spirtes, P. (2006). "Learning the structure of linear latent variable models". Journal of Machine Learning Research 7, 191-246.

Silva, R. and Scheines, R. (2005). "New d-separation identification results for learning continuous latent variable models". Proceedings of the Int. Conference on Machine Learning, ICML '05

Silva, R; Zhang, J. and Shanahan, J. G. (2005). "Probabilistic workflow mining". Proceedings of Knowledge Discovery and Data Mining, KDD '05

Silva, R.; Scheines, R.; Glymour, C. and Spirtes P. (2003) "Learning measurement models for unobserved variables". Proceedings of the Uncertainty in Artificial Intelligence Conference, UAI '03

Moody, J.; Silva, R.; Vanderwaart, J; Ramsey, J.. and Glymour, C. (2002). "Classification and filtering of spectra: a case study in mineralogy". Intelligent Data Analysis 6, 517-530

Moody, J.; Silva, R.; Vanderwaart, J. and Glymour, C. (2001). "Data filtering for automatic classification of rocks from reflectance spectra". Proceedings of the 7th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, KDD '01

Silva, R. B. A. and Ludermir, T. B. (2001). "Hybrid systems of local basis functions". Intelligent Data Analysis 5, 227-244

Silva, R. B. A. and Ludermir, T. B. (2000). "Obtaining simplified rules by hybrid learning". Proceedings of the 17th International Conference on Machine Learning, ICML '00

Silva, R. B.A and Ludermir, T. B. (1999). "Neural network methods for rule induction". Proceedings of the 1999 International Joint Conference on Neural Networks, Washington, DC

Patents

Shanahan, J. G; Silva, R. and Zhang, J. "Method and apparatus for probabilistic workflow mining". United States Patent 20070055558.

Current PhD students

Jakob Zeitler (September 2019-, EPSRC CDT on Foundational Artificial Intelligence)

Jacobo Roa Vincens (2016-, self funded)

William de Cothi (PhD Complex, 2015-, joint with Hugo Spiers (primary), UCL Institute of Behavioural Neuroscience, EPSRC CASE Award)

Pawel Chilinski (2014-, Computer Science (Part time), self funded)

PhD Students Supervised

Yin Cheng Ng (2019), "Learning Patterns from Sequential and Network Data Using Probabilistic Models".

Jean-Baptiste Regli (2018), "Probabilistic methods for high dimensional signal processing". Joint with James Nelson.

Rafael Carmo (2018), "Models and Algorithms for Episodic Time-series". Joint with Soong M Kang (Management Science, UCL).

Alex Gibberd (2017), "Regularised Inference for Changepoint and Dependency Analysis in Non-Stationary Processes". Joint with James Nelson and Sandipan Roy.

Samuel Parsons (2015), "Approximation methods for latent variable models".

Yi-Da Chiu (2014). "Exploratory Studies For Gaussian Process Structural Equation Models".

Selected Invited Talks

"On Causality, Fairness and Robustness". Gatsby Computational Neuroscience Unit 21st Anniversary Meeting, London, July 2019.

"Some Machine Learning Tools to Aid Causal Inference". Spotify Research Seminar, May 2019.

"Causal Inference, a Mini-Tutorial". Twitter Research Seminar, London, January 2019.

"Fairness, Causality and Machine Learning". Keynote talk, Finland AI Day, Helsinki, December 2018.

"Modelling Passenger Behaviour on the Underground". Data-Centric Engineering Group Seminar, The Alan Turing Institute, London, November 2018.

"A Causal Approach to Fairness". DeepMind Research Seminar, London, November 2018.

"Neural Networks and Graphical Models for Constructing and Fitting Cumulative Distribution Functions." Seminar on Computational Statistics and Machine Learning, Department of Statistics, University of Oxford, November 2018.

"Understanding Disruptions in the Tube System: Shocks, Flows and Predictability in the London Transportation Network". Invited lecture, University of Templeton, September 2018.

"Causal Resoning in Fairness". Fairness in Machine Learning Workshop, Google, Boston, August 2018.

"Learning Causal Effects: Bridging Instruments and Backdoors". Keynote talk, ACM SIGKDD Workshop on Causal Discovery, London, August 2018.

"Modelling Disruptions and Latent Structure on the London Underground". Technology and Data in Future Cities Workshop, Cambridge, June 2018.

"Counterfactual reasoning and algorithm fairness". Fairware 2018, IEEE/ACM International Workshop on Software Fairness, Gothenburg, Sweden, June 2018.

"Machine Learning and the Art of Causal Assumptions". Department of Epidemiology, Imperial

College, May 2018.

"Counterfactual Fairness". 10th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2013), London, December 2017.

"Machine Learning and the Art of Causal Assumptions". The Gatsby Computational Neuroscience Unit Seminar, UCL, October 2017.

"Machine Learning and the Art of Causal Assumptions". Leverhulme Bridges Programme Seminar, University of Warwick, September 2017.

"Prediction and Tomography of the London Underground". Invited session on Data-Centric Engineering, Meeting of the Royal Statistical Society, September 2017.

"Graphical Models for Spatiotemporal Processes". Defence Science and Technology Laboratory Seminar Series, Porton Down, September 2017.

"Some Machine Learning Tools to Aid Causal Inference". Statistics Seminar, Imperial College London, June 2017.

"Fairness in Machine Learning and Its Causal Aspects". Behavioural Insights seminar series, London, May 2017.

"Some Machine Learning Tools to Aid Causal Inference". Statistics and Data Analysis Seminar, Queen Mary University, London, December 2016.

"Causality and Artificial Intelligence". The Altius Society Annual Conference: "The Brain of the Future: Artificial Intelligence, Robotics and Automation, and Politics in the Age of Thinking Machines." Oxford, September 2016.

"The Role of Causal Inference in Machine Learning". HORSE2016: On "Horses"and "Potemkin Villages"in Applied Machine Learning. Queen Mary University, London, September 2016.

"Learning Causal Effects: Bridging Instruments and Backdoors". Distinguished Lecture, Center for Causal Discovery, University of Pittsburgh, Pittsburgh, PA, September 2016.

"Causal Inference in Machine Learning: From Structure to Predictions via Observational Data". Cubist Systematic Strategies, New York City, NY, June 2016.

"Causal Inference in Machine Learning: From Structure to Predictions via Observational Data". School of Informatics, University of Edinburgh, February 2016.

"Causal Inference in Machine Learning: Observational studies and beyond". Data Science For Pharma Summit, London, January 2016.

"Bayesian networks and the search for causality". London Bayesian Networks Meetup, London, October 2015.

"Understanding disruptions in the Tube system." First Transport for London (TfL) Research Forum, September 2015.

"Relaxing the assumptions of causal discovery algorithms". UK Causal Inference Meeting, Bristol, April 2015.

"Causal inference through a witness protection program". King's College Institute of Psychiatry, London, March 2015.

"Nodes from the Underground: Shocks, Flows and Predictability in the London Transportation Network". Department of Mathematics, University of Leicester, February 2015.

"Causal inference through a witness protection program". School of Mathematics and Statistics, University of Glasgow, February 2015.

"Causal inference through a witness protection program". Oxford Causal Inference One Day Meeting, Oxford, June 2014.

"Nodes from the Underground: Shocks, Flows and Predictability in the London Transportation Network". Statistics Seminar, Department of Statistics, Oxford, June 2014.

"Causal inference through a witness protection program". Max Planck Institute for Intelligent Systems, Tuebingen, Germany, May 2014.

"Nodes from the Underground: Shocks, Flows and Predictability in the London Transportation Network". Computer Science Seminar, Department of Computer Science, Universidade Federal do Ceará, Fortaleza, Brazil, March 2014.

"Bayesian inference in cumulative distribution fields". Encontro Brasileiro de Estatística Bayesiana, EBE 2014, Atibaia, SP, Brazil, March 2014.

"Inference in cumulative distribution fields." Computational Statistics Group Meeting, Department of Statistics, Oxford, February 2014.

"Shocks, Flows and Predictability in the London Transportation Network". Xerox Research Centre, Grenoble, January 2014.

"Flexible Sampling for the Gaussian Copula Extended rank likelihood model" . 6th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2013), London, December 2013.

"On factors and residuals: searching for latent Structure at two levels of detail." International Symposium on Incomplete Data Analysis and Causal Inference, Osaka University, September 2013.

"Representation and inference in mixed cumulative distribution networks". Symposium on Causal Inference, Computer Science Department, Radboud University, Netherlands, June 2013.

"Building better questionnaires with probabilistic modelling". Microsoft Research Seminar, Cambridge, UK, April 2013.

"The Structure of the Unobserved". High Energy Physics Seminar, UCL, January 2013.

"Representation and Learning in Directed Mixed Graph Models." Workshop on Networks: Processes and Causality. Organized by the Max-Planck Institute (Germany). Menorca, Spain, September 2012.

"From Hidden Variables to Observations, and Back". Winton Research Talk. Oxford, August 2012.

"Structured Copula Models in Supervised and Unsupervised Learning". 21st Belgian-Dutch Conference on Machine Learning (BeneLearn). Ghent, Belgium, May 2012.

"Exploiting Copula Parameterizations in Graphical Model Construction and Learning". Neural Information Processing Systems, Workshop on Copulas in Machine Learning. Sierra Nevada, Spain, December 2011.

"A MCMC Approach for Learning the Structure of Gaussian Acyclic Directed Mixed Graphs". 8th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society. Pavia, Italy, August 2011.

"Mixed Cumulative Distribution Networks". Selected Oral Presentation, 14th International Conference on Artificial Intelligence and Statistics. Ft. Lauderdale, FL, April 2011.

"Gaussian Process Structural Equation Models with Latent Variables". Selected Oral Presentation, 26th Conference on Uncertainty in Artificial Intelligence. Avalon, CA, July 2010.

"Ranking Relations Using Analogies". EPSRC Symposium Workshop on Information extraction from complex data sets (INF), University of Warwick. September 2009.

"Hidden Common Cause Relations in Relational Learning". Department of Computer Science, National University of Singapore. July 2008.

"Bayesian Inference for Mixed Graph Models". 7th World Congress in Probability and Statistics. Singapore, July 2008.

"Factorial Mixture of Gaussians and the Marginal Independence Model". *London Mathematical Society, Durham Symposium on Mathematical Aspects of Graphical Models (MAGM).* Durham, July 2008.

"Searching for Hidden Common Causes". *German-Israeli Foundation (GIF) Workshop*, Max-Planck Institute for Biological Cybernetics. Tübingen, May 2008.

"Factorial Mixture of Gaussians and the Marginal Independence Model". *Statistical Theory and Methods for Complex, High-Dimensional Data*, Isaac Newton Institute Seminar Series. Cambridge, May 2008.

"Advances in Graphical Models". Department of Statistics, University of Warwick. March, 2008.

"New Models for Relational Learning". Department of Computer Science, University of Pittsburgh, March 2008.

"Advances in Graphical Models". Department of Statistics, University of Glasgow, January 2008.

"The Hidden Life of Latent Variables: Bayesian Inference for Mixed Graph Models". Microsoft Research Cambridge, June 2007.

"Bayesian Measures of Analogical Similarity", Department of Engineering Mathematics, University of Bristol, April 2007.

"Graphical Models: Latent Variables and Beyond". Statistical Laboratory, University of Cambridge. April 2007.

"The Structure of the Unobserved: Modern Approaches for Latent Variable Modeling". Department of Computer Science, Brown University. Providence, RI, April 2007.

"Causality". Advanced Tutorial Lecture Series on Machine Learning. Department of Engineering,

University of Cambridge, November 2006.

"Bayesian Inference for Gaussian Mixed Graph Models". Selected Oral Presentation, 22nd Conference on Uncertainty in Artificial Intelligence, Boston, MA, July 2006.

"Model Search in Structural Equation Models with Latent Variables". 25th Biennial Conference of the Society for Multivariate Analysis in the Behavioral Sciences (SMABS). Budapest, Hungary, July 2006.

"Tutorial on Graphical Models for Probabilistic and Causal Modeling". ACM Fourteenth Conference on Information and Knowledge Management (CIKM), Bremen, Germany, October 2005.

"Probabilistic workflow mining." Selected Oral Presentation, 11th ACM Conference on Knowledge Discovery and Data Mining, Chicago, IL, August 2005.

"Latent Variables and Graphical Causal Models." Department of Statistics, University of Pittsburgh. Pittsburgh, PA, May 2005.

"Automatic Discovery of Latent Variable Models". Gatsby Computational Neuroscience Unit. London, UK, February 2005.

Other Activities

Area Chair, Conference on Uncertainty in Artificial Intelligence (UAI), 2010-2016, 2020.

Area Chair, AAAI Conference on Artificial Intelligence (AAAI), 2020.

Area Chair, Conference on Artificial Intelligence and Statistics (AISTATS). 2011-2012, 2020.

Senior Area Chair, Conference on Neural Information Processing Systems (NeurIPS), 2019.

Conference Chair, Uncertainty on Artificial Intelligence, 2019.

Area Chair, International Conference in Machine Learning (ICML), 2017-2019.

Program Chair, Uncertainty on Artificial Intelligence, 2018.

Area Chair, Conference on Neural Information Processing Systems (NIPS), 2014, 2017-2018.

Tutorial Chair, Conference on Uncertainty in Artificial Intelligence (UAI), 2017.

Senior Program Committee, Conference on information representation and estimation (INSPIRE 2009). Electrical and Electronic Engineering Department, Imperial College London, London, UK.

Publication Chair, International Conference on Machine Learning (ICML), 2007-2008.

Co-organizer, "From What If?' To 'What Next?': Causal Inference and Machine Learning for Intelligent Decision Making", Workshop at the 30th Neural Information Processing Systems Conference, Long Beach, December 2017.

Main organizer, "What If? Inference and Learning of Hypothetical and Counterfactual Interventions in Complex Systems", Workshop at the 29th Neural Information Processing Systems Conference, Barcelona, December 2016.

Co-organizer, "Causation: Foundation to Application", Workshop at the 32nd Conference on Uncertainty in Artificial Intelligence, June 2016, Jersey City, NJ.

Main organizer, "Advances in Causal Inference", Workshop at the 31st Conference on Uncertainty in Artificial Intelligence, July 2015, Amsterdam.

EPSRC Network on Computational Statistics and Machine Learning Management Group, 2014-.

EPSRC Peer Review College Member, 2012-

Memmber of the Senior Management Group, Department of Statistical Science, UCL, 2018-.

Member of the CSML Management Group, UCL, 2011-.

Departmental Tutor, Department of Statistical Science, UCL, 2011-2016.

Associate editor: Behaviormetrika, Springer, 2016-.

Coordinating editor: Statistics & Computing, Springer, 2013-.

Gatsby Machine Learning Journal Club, main organizer (2007).

Reviewer for the Conference on Uncertainty in Artificial Intelligence (UAI), Neural Information Processing Systems (NIPS), International Conference on Artificial Intelligence & Statistics (AISTATS), International Conference on Machine Learning (ICML), Simpósio Brasileiro de Inteligência Artificial (SBIA), International Joint Conference on Artificial Intelligence (IJCAI), European Symposium on Neural Networks (ESANN), European Conference on Machine Learning (ECML), European Conference on Artificial Intelligence (ECAI), Conference of the Association for the Advancement of Artificial Intelligence (AAAI), International Workshop on Statistical Relational Learning (SRL), IEEE ICDM Workshop on Causal Discovery, Journal of Machine Learning Research, Cognitive Science Journal, Machine Learning Journal, Journal of Artificial Intelligence Research, Journal of the Royal Statistical Society Series B & C, Annals of Statistics, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Neural Networks and Learning Systems, Biometrics, Behaviormetrika, Data Mining and Knowledge Discovery Journal, Computational Statistics and Data Analysis, Statistics and Computing, Computational Statistics, Neurocomputing, Foundations and Trends in Machine Learning, International Journal of Data Science and Analytics (JDSA), ACM Transactions on Intelligent Systems and Technology, ACM Computing Surveys, MIT Press.

Grant reviewer: EPSRC, MRC, NSF, Israel Science Foundation, Hong Kong Research Grants Council.

Carnegie Mellon University, Machine Learning Department, Pittsburgh, Pennsylvania USA

Summer researcher **2001-2003, 2005**

Developed and implemented algorithms for processing and classification of spectrometer data. Designed, implemented and evaluated algorithms for structural equation models with latent variables.

Clairvoyance Corporation, Pittsburgh, Pennsylvania USA

Summer researcher **2004**

Presented literature reviews on graphical models and text mining. Developed new algorithms and software on graphical models for workflow applications. Co-authored patent application.