Marco Scutari

updated as of June 4, 2023

Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA)
Polo Universitario Lugano, Via la Santa 1, 6962 Lugano (Switzerland)
https://www.bnlearn.com/about
scutari@bnlearn.com (work) marco.scutari@gmail.com (personal)

Fellowships and Positions

present – 2019 **Senior Researcher in Bayesian Networks and Probabilistic Graphical Models.**
Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA), Switzerland.

2018 – 2014 **Lecturer in Statistics.**
Department of Statistics and Somerville College, University of Oxford, UK.

2014 – 2011 **Research Associate in Statistical Genetics.**
UCL Genetics Institute, University College London, UK.

2011 – 2008 **Doctoral Research Fellow in Statistics.**
Department of Statistical Sciences, Università degli Studi di Padova, Italy.

Education

2011 – 2008 **Ph.D. in Statistical Sciences**, Doctoral School in Statistical Sciences.
Università degli Studi di Padova, Italy.
European Doctorate (Doctor Europeus).

Dissertation: *"Measures of Variability for Graphical Models"*
Supervisors: Adriana Brogini and Korbinian Strimmer, Institut für Medizinische Informatik, Statistik und Epidemiologie (IMISE), Universität Leipzig.

2007 – 2004 **M.Sc. in Statistics and Computer Science**, Faculty of Statistical Sciences.
Università degli Studi di Padova, Italy.
Graduation mark: 107/110.

Dissertation: *"Network Bayesiani: un Approccio Non Parametrico Basato sull'Entropia per la Selezione del Modello"* (*Bayesian Networks: an Entropy-Based Nonparametric Approach to Model Selection*).
Supervisors: Adriana Brogini and Fortunato Pesarin.

2004 – 2001 **B.Sc. in Statistics and Information Technologies**, Faculty of Statistical Sciences.
Università degli Studi di Padova, Italy.
Graduation mark: 110/110.

Dissertation: *"Miglioramenti della carta di controllo AEWMA"* (*Improving the AEWMA Control Chart*).
Supervisor: Guido Masarotto.

Grants Awarded

2016 **International Centre for Mathematical Sciences (ICMS, 1601-SCU).**
£22k grant covering all the expenses for organising and hosting a 4-day workshop by the title "Learning Graphical Models in High Dimensional Settings". Principal Organiser: Marco Scutari. Co-Organisers: Sofia Massa, Nuffield Department of Population Health; Robin Evans, Department of Statstics, University of Oxford.

Ph.D. Students and PostDocs

2023 – 2017 **Katharina Anders** (Ph.D. Student).
"To What Extent are Google Search Queries Predictive of User Intent?"
Oxford Internet Institute, University of Oxford; co-supervised with Scott Hale.

2021 **Francesca Panero** (Research Assistant).
"Fair Machine Learning Models"
Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA).

Service

2018 ≀ 2014 **Course Coordinator, M.Sc. in Applied Statistics, M.Sc. in Statistical Science.**
Department of Statistics, University of Oxford.

2018 ≀ 2015 **Internal Examiner, M.Sc. in Applied Statistics, M.Sc. in Statistical Science.**
Department of Statistics, University of Oxford.

2018 ≀ 2015 **Admissions Officer, M.Sc. in Applied Statistics, M.Sc. in Statistic.**
Department of Statistics, University of Oxford.

2018 ≀ 2015 **Admissions Officer, B.Sc. and M.Math. in Mathematics, Mathematics & Statistics, Mathematics & Computer Science, Computer Science.**
Somerville College, University of Oxford.

Professional Qualifications and Awards

2017 **Excellence Recognition Scheme.**
University of Oxford.

2015 **Fellow of the Higher Education Academy.**
The UK Professional Standards Body for teaching and support in higher education.

2000 **Preliminary English Test (PET).**
University of Cambridge International Examinations.

Professional Organisations

2018 ≀ 2014 International Society for Bayesian Analysis (ISBA).

Consulting

2023 ≀ 2021 **L'Oréal.**
Evaluation of Skin and Mental Diseases Connections on Google Search Trends Data.

2019 **United Nations.**
Analytical Tools for Capacity Building in Support of Prioritization of Sustainable Development Goals in National Development Strategies.

Collaborations with Companies

2022 ≀ 2019 **UBS.**
Machine Learning Applied to Business Challenges in the Banking Industry.

2018 **InvestAssure.**
Predicting Risks Associated with Corporate Responsibility, with Majied Mahran (M.Sc. in Statistical Science, University of Oxford).

2018 **Fospha.**
Effects of Weather on Human Behaviour, with Aynsley Bernard (M.Sc. in Statistical Science, University of Oxford).

2018 ≀ 2017 **AT&T.**
Dynamic Positioning of Mobile Tower Antennas with Dynamic Bayesian Networks.

2018 ≀ 2016 **ecoVeritas.**
Investigating Data Hierarchies and Sample Sizes in Packaging Waste Calculations and Their Effect, with Kun Wang, Guoxin Li (both from the M.Sc. in Applied Statistics, University of Oxford) and Deshuo Wang (M.Sc. in Statistical Science, University of Oxford).

2017 **Nielsen.**
Modelling Promotions using Bayesian Hierarchical Models, with Nicole Lester (M.Sc. in Applied Statistics, University of Oxford).
TV Set Location Prediction Using Supervised Machine Learning Techniques, with Chenchen Zhang (M.Sc. in Applied Statistics, University of Oxford).

2016 **Google and Deutsche Bahn.**
Comparing Time Series Modelling Methods for Optimising Deutsche Bahn's Media Investments, with Katharina Anders (M.Sc. in Applied Statistics, University of Oxford).

2015 **GlaxoSmithKline (GSK).**
Searching for Heterogeneity in Continuous End-Points from Clinical Trials Arising Due to Sub-Populations, with Linlin Yang (M.Sc. in Applied Statistics, University of Oxford).

Journals and Conferences

Editor

2021 PLoS Genetics (Guest Editor).

2020 ≀ 2011 Frontiers in Systems Biology, Frontiers in Genetics.

Programme/Scientific Committees

present ≀ 2014 International Conference on Probabilistic Graphical Models (PGM).

present ≀ 2020 Conference on Uncertainty in Artificial Intelligence (UAI).

present ≀ 2019 Workshop on Explainable Artificial Intelligence (CD-MAKE).

present ≀ 2021 International Conference of the Italian Association for Artificial Intelligence (AIxIA).

2020 International Joint Conference on Artificial Intelligence (IJCAI).

2019 Belgian Dutch Conference on Machine Learning (Benelearn).
Artificial Intelligence for Healthcare (AI4HB2E, IEEE CBMS).
Workshop on Explainable Artificial Intelligence (CD-MAKE).

2017 Advanced Methodologies for Bayesian Networks (AMBN).
Learning Graphical Models in High Dimensional Settings, Principal Organiser.

2015 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD).

2014 International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB).

2011 Workshop on Probabilistic Problem Solving in Biomedicine, Conference on Artificial Intelligence in Medicine (AIME).

Software

present ≀ 2007 **bnlearn** (author and maintainer).
An R package implementing Bayesian network learning and inference.

present ≀ 2020 **fairml** (author and maintainer).
An R package implementing machine learning models that ensure fair predictions.

present ≀ 2020 **rbmn** (maintainer).
An R package for Gaussian Bayesian networks.

2016 ≀ 2009 **packdep** (co-author with Radhakrishnan Nagarajan and maintainer).
An R package to explore dependencies between user-contributed R packages and identify key packages according to social network analysis metrics.

Publications

Books

2023 Scutari M and Malvestio M (2023). *The Pragmatic Programmer for Machine Learning: Engineering Analytics and Data Science Solutions*. Chapman & Hall.

2021 Scutari M and Denis JB (2021). *Bayesian Networks with Examples in R*. Chapman & Hall, 2nd edition.

2014 Denis JB and Scutari M (2014). *Réseaux Bayésiens avec R : Élaboration, Manipulation et Utilisation en Modélisation Appliquée*. Pratique R. EDP. This is a French translation of "Bayesian Networks with Examples in R".

Scutari M and Denis JB (2014). *Bayesian Networks with Examples in R*. Chapman & Hall.

2013 Nagarajan R, Scutari M, and Lèbre S (2013). *Bayesian Networks in R with Applications in Systems Biology*. Use R! series. Springer.

Book Chapters

2015 Scutari M (2015). Graphical Modelling in Genetics and Systems Biology. In Lucas P, editor, *Foundations of Biomedical Knowledge Representation*, Lecture Notes in Artificial Intelligence. Springer, pages 143–158.

Scutari M (2015). Personalised Medicine: Taking a New Look at the Patient. In Lucas P, editor, *Foundations of Biomedical Knowledge Representation*, Lecture Notes in Artificial Intelligence. Springer, pages 139–141.

2011 Scutari M and Strimmer K (2011). Introduction to Graphical Modelling. In Balding DJ, Stumpf M, and Girolami M, editors, *Handbook of Statistical Systems Biology*. Wiley, pages 237–251.

Journal Articles and Conference Papers

in the works Scutari M. fairml: A Statistician's Take on Fair Machine Learning Modelling. *Journal of Statistical Software*.

Scutari M, Kerob D, and Salah S. Inferring Skin-Brain-Skin Connections from Infodemiology Data using Dynamic Bayesian Networks. *Journal of Medical Informatics Research*.

Scutari M and Malvestio M. Developing and Running Machine Learning Software: Machine Learning Operations (MLOps). *Wiley StatsRef: Statistics Reference Online*.

Scutari M and Malvestio M. Machine Learning Software and Pipelines. *Wiley StatsRef: Statistics Reference Online*.

in print Briganti G, Decety J, Scutari M, and McNally RJ. Using Bayesian Networks to Investigate Psychological Constructs. *Pyschological Reports*.

Briganti G, Scutari M, and McNally RJ. A Tutorial on Bayesian Networks for Psychopathology Researchers. *Psychological Methods*.

2023 Liew BXW, Hartvigsen J, Scutari M, and Kongsted A (2023). Data-Driven Network Analysis Identified Subgroup-Specific Low Back Pain Pathways: A Cross-Sectional GLA:D Back Study. *Journal of Clinical Epidemiology*, 153:66–77.

Liew BXW, Palacios-Ceña M, Scutari M, Fuensalida-Novo S, Guerrero-Peral A, Ordás-Bandera C, Pareja JA, and Fernández-de-las-Peñas C (2023). Path Analysis Models Integrating Psychological, Neuro-Physiological and Clinical Variables in Individuals with Tension-Type Headache. *The Journal of Pain*, 24(3):426–436.

2022

Delucchi M, Spinner GR, Scutari M, Bijlenga P, Morel S, Friedrich CM, Furrer R, and Hirsch S (2022). Bayesian Network Analysis Reveals the Interplay of Intracranial Aneurysm Rupture Risk Factors. *Computers in Biology and Medicine*, 147:105740.

Liew BXW, de-la-Llave-Rincón AI, Scutari M, Arias-Buría JL, Cook CE, Cleland J, and Fernández-de-las-Peñas C (2022). Do Short-Term Effects Predict Long-Term Improvements in Women Who Receive Manual Therapy or Surgery for Carpal Tunnel Syndrome? A Bayesian Network Analysis of a Randomized Clinical Trial. *Physical Therapy*, 102(4):pzac015.

Scutari M (2022). Comments on: "Hybrid Semiparametric Bayesian Networks". *TEST*, 31:328–330.

Scutari M, Marquis C, and Azzimonti L (2022). Using Mixed-Effect Models to Learn Bayesian Networks from Related Data Sets. *Proceedings of Machine Learning Research (PGM 2022)*, 186:73–84.

Scutari M, Panero F, and Proissl M (2022). Achieving Fairness with a Simple Ridge Penalty. *Statistics and Computing*, 32:77.

2021

Azzimonti L, Corani G, and Scutari M (2021). A Bayesian Hierarchical Score for Structure Learning from Related Data Sets. *International Journal of Approximate Reasoning*, 142:248–265. This is an extended version of the "Structure Learning for Related Data Sets with a Hierarchical Bayesian Score" PMLR paper.

Bodewes T and Scutari M (2021). Learning Bayesian Networks from Incomplete Data with the Node-Averaged Likelihood. *International Journal of Approximate Reasoning*, 138:145–160. This is an extended version of the "Identifiability and Consistency of Bayesian Network Structure Learning from Incomplete Data" PMLR paper.

Bregoli A, Scutari M, and Stella F (2021). A Constraint-Based Algorithm for the Structural Learning of Continuous-Time Bayesian Networks. *International Journal of Approximate Reasoning*, 138:105–122. This is an extended version of the "Constraint-Based Learning for Continuous-Time Bayesian Networks" PMLR paper.

Briganti G, Scutari M, and Linkowski P (2021). Network Structures of Symptoms from the Zung Depression Scale. *Psychological Reports*, 124(4):1897–1911.

Liew BXW, Ford JJ, Scutari M, and Hahne AJ (2021). Using Data-Driven Bayesian Network Analysis to Explore Recovery Pathways in People with Low Back Pain Receiving Individualised Physiotherapy or Advice. *PLoS ONE*, 16(10):e0258515.

Liew BXW, Peolsson A, Falla D, Cleland JA, Scutari M, Kierkegaard M, and Dedering Å (2021). Mechanisms of Recovery after Neck-Specific or General Exercises in Patients with Cervical Radiculopathy. *European Journal of Pain*, 25(5):1162–1172.

Pedrero-Martin Y, Falla D, Martinez-Calderon J, Liew BXW, Scutari M, and Luque-Suarez A (2021). Self-Efficacy Beliefs Mediate the Association Between Pain Intensity and Pain Interference in Acute/Subacute Whiplash-Associated Disorders. *European Spine Journal*, 20:1689–1698.

2020

Azzimonti L, Corani G, and Scutari M (2020). Structure Learning for Related Data Sets with a Hierarchical Bayesian Score. *Proceedings of Machine Learning Research (PGM 2020)*, 138:5–16.

Bodewes T and Scutari M (2020). Identifiability and Consistency of Bayesian Network Structure Learning from Incomplete Data. *Proceedings of Machine Learning Research (PGM 2020)*, 138:29–40.

Bregoli A, Scutari M, and Stella F (2020). Constraint-Based Learning for Continuous-Time Bayesian Networks. *Proceedings of Machine Learning Research (PGM 2020)*, 138:41–52. Best Student Paper award.

Briganti G, Scutari M, and Linkowski P (2020). A Machine Learning Approach to Relationships Among Alexithymia Components. *Psychiatria Danubina*, 32(Suppl. 1):180–187.

Fisher H, Gittoes M, Evans L, Bitchell L, Mullen R, and Scutari M (2020). An Interdisciplinary Examination of Stress and Injury Occurrence in Athletes. *Frontiers in Sports and Active Living*, 2(595619):1–20.

Liew BXW, Peolsson A, Scutari M, Löfgren H, Wibault J, Dedering Å, Öberg B, Zsigmond P, and Falla D (2020). Probing the Mechanisms Underpinning Recovery in Post-Surgical Patients with Cervical Radiculopathy Using Bayesian Networks. *European Journal of Pain*, 24(5):909–920.

Ruggieri A, Stranieri F, Stella F, and Scutari M (2020). Hard and Soft EM in Bayesian Network Learning from Incomplete Data. *Algorithms*, 13(12):329.

Scutari M (2020). Bayesian Network Models for Incomplete and Dynamic Data. *Statistica Neerlandica*, 74(3):397–419.

Sheldrake TE, Caricchi L, and Scutari M (2020). Tectonic Control on Global Variations in the Record of Large-Magnitude Explosive Eruptions in Volcanic Arcs. *Frontiers in Earth Sciences*, 8(127):1–14.

2019

Liew BXW, Scutari M, Peolsson A, Peterson G, Ludvigsson ML, and Falla D (2019). Investigating the Causal Mechanisms of Symptom Recovery in Chronic Whiplash Associated Disorders using Bayesian Networks. *The Clinical Journal of Pain*, 35(8):647–655.

Scutari M, Graafland CE, and Gutiérrez JM (2019). Who Learns Better Bayesian Network Structures: Accuracy and Speed of Structure Learning Algorithms. *International Journal of Approximate Reasoning*, 115:235–253. This is an extended version of the "Who Learns Better Bayesian Network Structures: Constraint-Based, Score-Based or Hybrid Algorithms?" PMLR paper.

Scutari M, Vitolo C, and Tucker A (2019). Learning Bayesian Networks from Big Data with Greedy Search: Computational Complexity and Efficient Implementation. *Statistics and Computing*, 25(9):1095–1108.

2018

Chao YS, Scutari M, Chen TS, Wu CJ, Durand M, Boivin A, Wu HS, and Chen WC (2018). A Network Perspective of Engaging Patients in Specialist and Chronic Illness Care: the 2014 International Health Policy Survey. *PLoS ONE*, 13(8):e0201355.

Scutari M (2018). Dirichlet Bayesian Network Scores and the Maximum Relative Entropy Principle. *Behaviormetrika*, 45(2):337–362. This is an extended version of the "Dirichlet Bayesian Network Scores and the Maximum Entropy Principle" PMLR paper.

Scutari M, Graafland CE, and Gutiérrez JM (2018). Who Learns Better Bayesian Network Structures: Constraint-Based, Score-Based or Hybrid Algorithms? *Proceedings of Machine Learning Research (PGM 2018)*, 72:416–427.

Vitolo C, Scutari M, Tucker A, and Russell A (2018). Modelling Air Pollution, Climate and Health Data Using Bayesian Networks: a Case Study of the English Regions. *Earth and Space Science*, 5(4):76–88.

2017

Chao YS, Wu HT, Scutari M, Chen TS, Wu CJ, Durand M, and Boivin A (2017). A Network Perspective on Patient Experiences and Health Status: the Medical Expenditure Panel Survey 2004 to 2011. *BMC Health Services Research*, 17(579):1–12.

Scutari M (2017). Dirichlet Bayesian Network Scores and the Maximum Entropy Principle. *Proceedings of Machine Learning Research (AMBN 2017)*, 73:9–20.

Scutari M (2017). Bayesian Network Constraint-Based Structure Learning Algorithms: Parallel and Optimised Implementations in the bnlearn R Package. *Journal of Statistical Software*, 77(2):1–20.

Scutari M, Auconi P, Caldarelli G, and Franchi L (2017). Bayesian Networks Analysis of Malocclusion Data. *Scientific Reports*, 7(15236):1–11.

2016

Scutari M (2016). An Empirical-Bayes Score for Discrete Bayesian Networks. *Journal of Machine Learning Research (Proceedings Track, PGM 2016)*, 52:438–448.

Scutari M, Mackay I, and Balding DJ (2016). Using Genetic Distance to Infer the Accuracy of Genomic Prediction. *PLoS Genetics*, 12(9):e1006288, 1–19.

2014

Bentley AR, Scutari M, Gosman N, Faure S, Bedford F, Howell P, Cockram J, Rose GA, Barber T, Horsnell R, Pumfrey C, Winnie E, Shacht J, Beauchêne K, Praud S, Greenland A, Balding DJ, and Mackay I (2014). Applying Association Mapping and Genomic Selection to the Dissection of Key Traits in Elite European Wheat. *Theoretical and Applied Genetics*, 127(12):2619–2633.

Scutari M, Howell P, Balding DJ, and Mackay I (2014). Multiple Quantitative Trait Analysis Using Bayesian Networks. *Genetics*, 198(1):129–137.

Tian S, Scutari M, and Denis JB (2014). Crossed Linear Gaussian Bayesian Networks, Parsimonious Models. *Journal de la Société Française de Statistique*, 155(3):1–21.

2013

Nagarajan R and Scutari M (2013). Impact of Noise on Molecular Network Inference. *PLoS ONE*, 12(e80735):1–12.

Scutari M (2013). On the Prior and Posterior Distributions Used in Graphical Modelling (with discussion). *Bayesian Analysis*, 8(3):505–532.

Scutari M, Mackay I, and Balding DJ (2013). Improving the Efficiency of Genomic Selection. *Statistical Applications in Genetics and Molecular Biology*, 12(4):517–527.

Scutari M and Nagarajan R (2013). On Identifying Significant Edges in Graphical Models of Molecular Networks. *Artificial Intelligence in Medicine*, 57(3):207–217.

2012

Scutari M and Brogini A (2012). Bayesian Network Structure Learning with Permutation Tests. *Communications in Statistics—Theory and Methods*, 41(16–17):3233–3243.

2010 Nagarajan R, Datta S, Scutari M, Beggs ML, Nolen GT, and Peterson CA (2010). Functional Relationships Between Genes Associated with Differentiation Potential of Aged Myogenic Progenitors. *Frontiers in Physiology*, 1(21):1–8.

Scutari M (2010). Learning Bayesian Networks with the bnlearn R Package. *Journal of Statistical Software*, 35(3):1–22.

2009 Chavan SS, Bauer MA, Scutari M, and Nagarajan R (2009). NATbox: a Network Analysis Toolbox in R. *BMC Bioinformatics*, 10(Suppl 11):S14.

Conference Presentations and Seminars

Conference Presentations

2023 Inferring Skin-Brain-Skin Connections from Infodemiology Data Using Dynamic Bayesian Networks. Featured poster (top 25) at the 25th World Congress of Dermatology, Singapore, August 3–8.

Analysing Google Search Trends Data with Dynamic Bayesian Networks. Workshop on Sparse Inference on Complex Networks, Università della Svizzera Italiana, June 27.

2022 Using Mixed-Effect Models to Learn Bayesian Networks from Related Data Set. Presented at the 11th International Conference on Probabilistic Graphical Models (PGM), Almería, October 5.

2021 Mapping Complex Data with Bayesian Networks. Invited talk at the Spring Meeting of the Dutch Statistical Society (BMS/ANed), May 21.

2020 Identifiability and Consistency of Bayesian Network Structure Learning from Incomplete Data. Presented at the 10th International Conference on Probabilistic Graphical Models (PGM), Aalborg, September 24.

2019 The Regional Dimension: a Bayesian Network Analysis. Invited talk at the "Analytical Tools for Capacity Building on Quantitative Methods for SDG Interactions and Integration in National Development Strategies and Integrated Planning" Technical Workshop, United Nations Economic Commission for Africa (UNECA), Addis Ababa, December 19.

Challenges in Bayesian Network Modelling of Climate and Weather Data. Invited talk at the 1st "Artificial Intelligence for Copernicus" Workshop, Reading, November 6.

bnlearn: Practical Bayesian Networks in R. Invited tutorial at the "UseR!" Conference, Toulouse, July 9.

2018 Who Learns Better Bayesian Network Structures: Constraint-Based, Score-Based or Hybrid Algorithms? Presented at the 9th International Conference on Probabilistic Graphical Models (PGM), Prague, September 10.

2017 Bayesian Dirichlet Bayesian Network Scores and the Maximum Entropy Principle. Invited talk at the 10th International Conference of the ERCIM Working Group on Computational and Methodological Statistics (ERCIM 2017), London, December 17.

Bayesian Dirichlet Bayesian Network Scores and the Maximum Entropy Principle. Invited talk at the 3rd Workshop on "Advanced Methodologies for Bayesian Networks" (AMBN), Kyoto, September 22.

bnlearn, Learning Bayesian Networks 10 Years Later. Invited talk at the "Bayesian Networks Tools" Workshop, Tokyo, September 19.

Bayesian Networks, MAGIC Populations and Multiple Trait Prediction. Invited talk at the "Learning Graphical Models in High Dimensions" Workshop, ICMS, Edinburgh, April 6.

Beyond Uniform Priors in Bayesian Network Structure Learning. Invited talk at the "Learning Graphical Models in High Dimensions" Workshop, ICMS, Edinburgh, April 5.

2016 Bayesian Networks, MAGIC Populations and Multiple Trait Prediction. Poster at the "Probabilistic Modeling in Genomics" Workshop, Oxford, September 12.

An Empirical-Bayes Score for Discrete Bayesian Networks. Presented at the 8th International Conference on Probabilistic Graphical Models (PGM), Lugano, September 8.

Bayesian Networks, MAGIC Populations and Multiple Trait Prediction. Invited talk at the 5th International Conference on Quantitative Genetics (ICQG), Madison, June 14.

2015 Modelling Survey Data with Bayesian Networks. Invited talk at the "Bayesian Networks at Work" Workshop, Data Methods and Systems Statistical Laboratory, University of Brescia, May 18.

2014 Genotype-Environment Effects Analysis using Bayesian Networks. Invited talk at the 7th International Conference of the ERCIM Working Group on Computational and Methodological Statistics (ERCIM 2014), Pisa, December 7.

Predictive Accuracy: a Function of Genetic Distance. Poster at the "Statistical and Computational Methods for Relatedness and Relationship Inference from Genetic Marker Data" Workshop, International Centre for Mathematical Sciences (ICMS), Edinburgh, September 22.

On the Prior and Posterior Distributions Used in Graphical Modelling. Invited talk at the Joint Statistical Meetings (JSM), Boston, August 5.

Multiple Quantitative Trait Analysis in Statistical Genetics with Bayesian Networks. Presented at the "Integrating the Genome with the Phenome", Bloomsbury Centre for Genetic Epidemiology and Statistics (BCGES) and South of England Genetic Epidemiology Group (SEGEG) Annual Meeting, London, July 8.

Multiple Quantitative Trait Analysis in Statistical Genetics with Bayesian Networks. Invited talk at the 11th International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics, Cambridge, June 28.

Multiple Quantitative Trait Analysis in Statistical Genetics with Bayesian Networks. Invited plenary talk at "Graphical Causality Models: Tree, Bayesian Networks and Big Data", European Network for Business and Industrial Statistics (ENBIS)–Société Française de Statistique (SFdS) Spring Meeting, Paris, April 9.

2013 Learning Bayesian Networks in R: an Example in Systems Biology. Tutorial at the "UseR!" Conference, University of Castilla-La Mancha, Albacete, July 9.

Graphical Models for Genomic Selection. Presented at the MAGIC Workshop, National Institute for Agricultural Botany (NIAB), Cambridge, June 12.

Bayesian Networks for Gene Network Discovery: Parallel and Optimised Learning. Poster at the "Mathematical and Statistical Aspects of Molecular Biology" Conference (MASAMB), Imperial College, London, April 11.

2012 Efficient Use of Marker Profiles in Genomic Selection. Presented at the 15th Meeting of the EUCARPIA Section "Biometrics in Plant Breeding", Hohenheim, September 5.

2011 On Identifying Significant Edges in Graphical Models. Presented at the Workshop "Probabilistic Problem Solving in Biomedicine" of the 13th Artificial Intelligence in Medicine (AIME) Conference, Bled (Slovenia), July 2.

2010 Constraint-based Bayesian Network Learning with Permutation Tests. Presented at the Conference "Statistics for Complex Problems: the Multivariate Permutation Approach and Related Topics", Padova, June 15.

Seminars

2023 Fair Machine Learning: Achieving Fairness with a Simple Ridge Penalty. Department of Informatics, Systems and Communication, University of Milano Bicocca, June 29.

Fair Machine Learning: Achieving Fairness with a Simple Ridge Penalty. Department of Statistics, London School of Economics (LSE), June 12.

Analysing Google Search Trends Data with Dynamic Bayesian Networks. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University, January 30.

Analysing Google Search Trends Data with Dynamic Bayesian Networks. Institute for Global Environmental Strategies (IGES), Tokyo, January 20.

Bayesian Network Models for Continuous-Time and Structured Data. National Institute of Advanced Industrial Science and Technology (AIST), Tokyo, January 19.

2022 Bayesian Network Models for Continuous-Time and Structured Data. School of Computation, Information and Technology, Technische Universität München, September 7.

bnlearn: Practical Bayesian Networks in R. Department of Biomedical Data Intelligence, Graduate School of Medicine, Kyoto University, April 18.

Mapping Complex Data with Bayesian Networks. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University; and online for the Japanese Behaviormetric Society, April 6.

Bayesian Networks and Their Extensions in Modern Machine Learning. Center for Complexity and Biosystems, University of Milan, February 28.

2021 Bayesian Networks and Their Extensions in Modern Machine Learning. Department of Economics, University of Crete, October 13.

Introduction to Bayesian Networks: How We Can Use Them as Probabilistic and Causal Models. Digital Health Lab Day, Zurich University of Applied Sciences (ZHAW), Winterthur, September 16.

Bayesian Networks and Their Extensions in Modern Machine Learning. Department of Economics and Management, University of Brescia, April 8.

2019 Bayesian Networks, Big Data and Greedy Search: Efficient Implementation with Classic Statistics. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University, April 3.

2017 Dirichlet Bayesian Network Scores and the Maximum Entropy Principle. Department of Mathematics, Brunel University London, November 24.

An Empirical-Bayes Score for Discrete Bayesian Networks. Department of Informatics, Systems and Communication, University of Milano Bicocca, January 17.

2016 Bayesian Network Modelling with Examples. IBM Analytics, London Data Science Studio, November 28.

Bayesian Networks, MAGIC Populations and Mutliple Trait Prediction. School of Agriculture, Food, and Rural Development, Newcastle University, November 16.

Bayesian Network Modelling: with Examples in Genetics and Systems Biology. Bayesian Networks Meetup, Alan Turing Institute, September 29.

2015 Using Genetic Distance to Infer the Accuracy of Genomic Prediction. Statistical Omics Meeting Series, Imperial College, London, September 7.

2013 Graphical Models for Genomic Selection. Unité Mathématiques et Informatique Appliquées, INRA, Jouy-en-Josas, November 7.

On the Prior and Posterior Distributions Used in Graphical Modelling. Graphical Modelling Reading Club, Department of Statistics, University of Oxford, October 25.

Bayesian Network Modelling in Genetics and Systems Biology. Biomathematics Seminar, Imperial College, October 15.

Applications of Bayesian Networks in Genetics and Systems Biology. Computational Biology Seminar, University of Liverpool, September 13.

2012 Graphical Models and Protein Signalling Networks. Astellas, Leiden, November 5.

2011 Measures of Variability for Graphical Models. Genetics Institute, University College London (UCL), March 14.

2010 Bayesian Network Resampling for the Analysis of Functional Relationships. Institut für Medizinische Informatik, Statistik und Epidemiologie (IMISE), Universität Leipzig, October 12.

2009 Structure Variability in Graphical Models. Machine Learning / Intelligent Data Analysis Group, Institut für Softwaretechnik und Theoretische Informatik, Technische Universität Berlin, November 5.

Comparing Bayesian Networks and Structure Learning Algorithms. Institut für Medizinische Informatik, Statistik und Epidemiologie (IMISE), Universität Leipzig, October 20.

2008 Network Bayesiani: Selezione del Modello (*Bayesian Networks: Structure Learning Algorithms*). Department of Information Engineering, Università degli Studi di Padova, November 4.

Teaching

present ≀ 2022/23 **Advanced Probabilistic Modelling.**
Department of Innovative Technologies, University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland.
M.Sc. in Engineering, Data Science.

present ≀ 2020/21 **Practical Bayesian Networks for Clinical Data.**
European Institute of Oncology (IEO), European School of Molecular Medicine (SEMM), Italy.
Centre for Doctoral Training.

2023 **Advanced Data Science I.**
Center for Mathematical Modeling and Data Science, Osaka University, Japan.
Graduate School of Engineering Science.

2022 **Bayesian Networks in Policy and Society.**
Department of Economics, School of Social Sciences, University of Crete, Greece.
Advanced Summer School in Economics & Econometrics.

2021/22 ≀ 2019/20 **Uncertainty Reasoning and Data Mining.**
Department of Innovative Technologies, University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland.
M.Sc. in Engineering.

2018/19 ≀ 2015/16 **R Programming, Statistical Programming.**
Department of Statistics, University of Oxford, UK.
M.Sc. in Applied Statistics, M.Sc. in Statistical Science.

2018/19 ≀ 2014/15 **Probability and Statistics (1st and 2nd year).**
Somerville College, University of Oxford, UK.
B.Sc. and M.Math. in Mathematics, Mathematics & Statistics, Mathematics & Computer Science, Computer Science.

2018/19 **Linear Algebra (1st year).**
Somerville College, University of Oxford, UK.
B.Sc. and M.Math. in Computer Science.

2017 **Understanding Bayesian Networks.**
Department of Statistical Sciences, Università Cattolica del Sacro Cuore, Italy.
Graduate course in collaboration with the Italian Statistical Society (SIS).

2016/17 **Graph Theory (2nd year).**
Somerville College, University of Oxford, UK.
B.Sc. and M.Math. in Mathematics, Mathematics & Statistics, Mathematics & Computer Science, Computer Science.

2015/16 ≀ 2014/15 **Linear Models.**
Department of Statistics, University of Oxford, UK.
M.Sc. in Applied Statistics.

2014/15 **Log-Linear Models and Contingency Tables.**
Department of Statistics, University of Oxford, UK.
M.Sc. in Applied Statistics.

2012/13 ≀ 2011/12 **Introduction to Genetic Epidemiology in the GWAS Era.**
Bloomsbury Centre for Genetic Epidemiology and Statistics, University College London, UK.
Graduate course.

2011/12 **Graphical Models: Model Estimation and Validation.**
Department of Statistical Sciences, Università degli Studi di Padova, Italy.
Graduate course for the Doctoral School in Statistical Sciences.

2007/08 **Database Management Systems II.**
Faculty of Statistical Sciences, Università degli Studi di Padova, Italy.
M.Sc. in Statistics and Computer Science.

Advanced Training Courses

06/2010 **Monte Carlo Statistical Methods.**
Doctoral School in Statistical Sciences, Università degli Studi di Padova, Italy.
Instructor: George Casella, Department of Statistics, University of Florida.

09/2009 **Statistical Learning and Data Mining.**
Zentrum für Bioinformatik und Biostatistik, Donau-Universität Krems, Austria.
Instructor: Trevor Hastie and Robert Tibshirani, Department of Statistics, Stanford University.

05/2009 **Analysis of Clustered Categorical Data.**
Doctoral School in Statistical Sciences, Università degli Studi di Padova, Italy.
Instructor: Alan Agresti, Department of Statistics, University of Florida.

11/2009 ≀ 10/2009 **Statistical Methods.**
Doctoral School in Information Engineering, Università degli Studi di Padova, Italy.
Instructor: Lorenzo Finesso, Institute for Biomedical Engineering (ISIB), National Research Council (CNR).

Visiting Periods

01/2017 **Università Cattolica del Sacro Cuore**, Italy.
Department of Statistical Sciences.
Host: Guido Consonni.

01/2017 **Università degli Studi di Milano-Bicocca**, Italy.
Department of Informatics, Systems and Communication.
Host: Fabio Stella.

10/2010 ≀ 09/2010 **Universität Leipzig**, Germany.
Institut für Medizinische Informatik, Statistik und Epidemiologie (IMISE).
Host: Korbinian Strimmer.

11/2009 ≀ 10/2009 **Universität Leipzig**, Germany.
Institut für Medizinische Informatik, Statistik und Epidemiologie (IMISE).
Host: Korbinian Strimmer.