

# Antonello Maruotti

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## PERSONAL DATA

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## CONTACT INFORMATION

Dipartimento di Giurisprudenza, Economia, Politica e  
Lingue Moderne  
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## RESEARCH INTERESTS

Hidden Markov Models, Random Effects Models for Longitudinal and Correlated Data, Finite Mixtures, Binary and Count Data Models, Environmental Statistics, Health Economics, Applied Econometrics.

## ACADEMIC APPOINTMENTS

- Full Professor in Statistics** November 2019 to present  
Dipartimento di Giurisprudenza, Economia, Politica e Lingue Moderne  
Libera Università Maria Ss Assunta
- Adjuncted Professor in Statistics** October 2018 to present  
Department of Mathematics  
University of Bergen
- Visiting Research Fellow** July 2019 to present  
School of Computing - Faculty of Technology  
University of Portsmouth
- Associate Professor in Statistics** October 2015 to October 2019  
Dipartimento di Giurisprudenza, Economia, Politica e Lingue Moderne  
Libera Università Maria Ss Assunta
- Senior Research Fellow** June 2015 to August 2017  
Centre for Innovation and Leadership in Health Sciences  
University of Southampton
- Lecturer in Statistics** December 2008 to October 2015  
Dipartimento di Scienze Politiche,  
Università di Roma Tre
- Lecturer in Medical Statistics** July 2012 to March 2015  
Southampton Statistical Sciences Research Institute (S3RI) & School of Mathematics,  
University of Southampton
- Research Fellow** February 2008 to December 2008  
Dipartimento di Istituzioni Pubbliche, Economia e Società,  
Università di Roma Tre

## EDUCATION

**Sapienza Università di Roma**, Roma, Italy

Ph.D., Methodological Statistics, February 2008

- Thesis Topic: *Hidden Markov models for longitudinal observations*
- Advisor: Professor Maurizio Vichi
- Area of Study: Statistical Modelling and Classification

M.Sc. Health Economics June 2004

- Thesis Topic: *Statistical modelling and economic evaluation in clinical trials*
- Advisor: Dr Federico Spandonaro
- Area of Study: Statistical Modelling and Economic evaluation

M.S., Statistics and Economics, April 2003

- Thesis Topic: *New tools of intervention for the South*
- Advisor: Professor Francesco Nucci
- Area of Study: Statistics and Economics

1. A. Punzo, S. Ingrassia and A. Maruotti (2020). Multivariate hidden Markov regression models: random covariates and heavy-tailed distributions. *Statistical Papers*, to appear.
2. M. Ranalli and A. Maruotti (2020). Model-based clustering for noisy longitudinal circular data, with application to animal movement. *Environmetrics*, 31: e2572.
3. A. Maruotti, A. Punzo and L. Bagnato (2019). Hidden Markov and semi-Markov models with multivariate leptokurtic-normal components for robust modeling of daily returns series. *Journal of Financial Econometrics*, 17: 91–117.
4. G. Mastrantonio, G. Jona-Lasinio, A. Maruotti and G. Calise (2019). Invariance properties and statistical inference for circular data. *Statistica Sinica*, 29: 67–80.
5. O. Anan, D. Böhning and A. Maruotti (2019). On the Turing estimator in capture-recapture count data under the geometric distribution. *Metrika*, 82: 149–172.
6. M. Centoni, V. Del Panta, A. Maruotti and V. Raponi (2019). Concomitant-variable latent-class beta inflated models to assess students performance: an Italian case study. *Social Indicators Research*, 141: 7–18.
7. A. Maruotti, J. Bulla and T. Mark (2019). Assessing the influence of marketing activities on customer behaviors: a dynamic clustering approach. *METRON*, 77: 19–42.
8. A. Punzo, S. Ingrassia and A. Maruotti (2018). Multivariate generalized hidden Markov regression models with random covariates: physical exercise in an elderly population. *Statistics in Medicine*, 37: 2797–2808.
9. A. Punzo, L. Bagnato and A. Maruotti (2018). Compound unimodal distributions for insurance losses. *Insurance: Mathematics and Economics*, 81: 95–107.
10. A. Punzo, A. Mazza and A. Maruotti (2018). Fitting insurance and economic data with outliers: A flexible approach based on finite mixtures of contaminated gamma distributions. *Journal of Applied Statistics*, 45: 2563–2584.
11. A. Maruotti, J. Bulla, F. Lagona, M. Picone and F. Martella (2017). Dynamic mixtures of factor analyzers to characterize multivariate air pollutant exposures. *Annals of Applied Statistics*, 11: 1617–1648.
12. M. Bernardi, A. Maruotti and L. Petrella (2017). Multiple risk measures for multivariate dynamic heavy-tailed models. *Journal of Empirical Finance*, 43: 1–32.
13. A. Maruotti and A. Punzo (2017). Model-based time-varying clustering of multivariate longitudinal data with covariates and outliers. *Computational Statistics & Data Analysis*, 113: 475–496.
14. O. Anan, D. Böhning and A. Maruotti (2017). Uncertainty estimation in heterogeneous capture-recapture count data. *Journal of Statistical Computation and Simulation*, 87: 2094–2114.
15. O. Anan, D. Böhning and A. Maruotti (2017). Population size estimation and heterogeneity in capture-recapture data: A regression estimator based on the Conway-Maxwell-Poisson distribution. *Statistical Methods & Applications*, 26: 49–79.
16. A. Punzo and A. Maruotti (2016). Clustering multivariate longitudinal observations: The contaminated Gaussian hidden Markov model. *Journal of Computational and Graphical Statistics*, 25: 1097–1116.
17. A. Maruotti, A. Punzo, G. Mastrantonio and F. Lagona (2016). A time-dependent extension of the projected normal regression model for longitudinal circular data based on a hidden Markov heterogeneity structure. *Stochastic Environmental Research and Risk Assessment*, 30: 1725–1740.
18. A. Maruotti (2016) Analyzing longitudinal circular data by projected normal models: a semi-parametric approach based on finite mixture models. *Environmental and Ecological Statistics*, 23: 257–277.
19. A. Maruotti, V. Raponi and F. Lagona (2016). Handling endogeneity and non-negativity in correlated random effects models: evidence from ambulatory expenditure. *Biometrical Journal*, 58: 280–302.

20. V. Raponi, F. Martella and A. Maruotti (2016). A biclustering approach to university performances: an Italian case study. *Journal of Applied Statistics*, 43: 31-45.
21. A. Maruotti and M. Vichi (2016). Time-varying clustering of multivariate longitudinal observations. *Communications in Statistics - Theory and Methods*, 45: 430-445.
22. F. Lagona, A. Maruotti and F. Padovano (2015). Multilevel multivariate modelling of legislative count data, with hidden Markov chain. *Journal of the Royal Statistical Society - Series A*, 178: 705-723.
23. F. Lagona, M. Picone and A. Maruotti (2015). A hidden Markov model for the analysis of cylindrical time series. *Environmetrics*, 26: 534-544.
24. F. Lagona, A. Maruotti, M. Picone and S. Cosoli. (2015) A hidden Markov approach to the analysis of space-time environmental data with linear and circular components. *Stochastic Environmental Research and Risk Assessment*, 29: 397-407.
25. G. Mastrantonio, A. Maruotti and G. Jona-Lasinio (2015). Bayesian hidden Markov modelling using circular-linear general projected normal distribution. *Environmetrics*, 26: 145-158.
26. A. Maruotti, (2015) Handling non-ignorable dropouts in longitudinal data: A conditional model based on a latent Markov heterogeneity structure. *TEST*, 24: 84-109.
27. J. Bulla, F. Lagona, A. Maruotti and M. Picone (2015). Environmental conditions in semi-enclosed basins: A dynamic latent class approach for mixed-type multivariate variables. *Journal de la Soci t  Francaise de Statistique*, 156: 114-136.
28. A. Maruotti and V. Raponi (2014). On baseline conditions for zero-inflated longitudinal count data. *Communications in Statistics - Simulation and Computation*, 43:743-760.
29. A. Maruotti (2014). Robust fitting of hidden Markov regression models under a longitudinal setting. *Journal of Statistical Computation and Simulation*, 84: 1728-1747.
30. A. Maruotti (2014). Book review: Latent Markov models for longitudinal data. *Metron*, 72: 367-368.
31. I. Martinez-Zarzoso and A. Maruotti (2013). The environmental Kuznets curve: functional form, time-dependent heterogeneity and outliers in a panel setting. *Environmetrics*, 24: 461-465.
32. T. Mark, M. Vandenbosch, K.N. Lemon, J. Bulla and A. Maruotti (2013). Capturing the evolution of customer-firm relationships: How customers become more (or less) valuable over time. *Journal of Retailing*, 89: 231-245.
33. F. Belloc, M. Bernardi, A. Maruotti and L. Petrella (2013). A dynamic hurdle model for zero-inflated panel count data. *Applied Economics Letters*, 20: 837-841.
34. M. Bernardi, A. Maruotti and L. Petrella (2012). Skew mixture models for loss distributions: A bayesian approach. *Insurance: Mathematics and Economics*, 51: 617-623.
35. J. Bulla, F. Lagona, A. Maruotti and M. Picone (2012). Model-based clustering under complex settings: a multivariate hidden Markov models for the identification of sea regimes from incomplete skewed and circular time series. *Journal of Agricultural, Biological, and Environmental Statistics*, 17: 544-567.
36. V. Barbu, J. Bulla and A. Maruotti (2012). Estimation of the stationary distribution of a semi-Markov chain. *Journal of Reliability and Statistical Studies*, 5: 15-26.
37. M. Auteri and A. Maruotti (2012). Modelling waiting times in the Italian National Health Service. *Applied Economics Letters*, 19: 459-465.
38. A. Maruotti and R. Rocci (2012). A mixed non-homogeneous hidden Markov model for categorical data, with application to alcohol consumption. *Statistics in Medicine*, 31: 871-886.
39. A. Maruotti (2011). Mixed hidden Markov models for longitudinal data: an overview. *International Statistical Review*, 79: 427-454.
40. A. Maruotti (2011). A two-part mixed-effects pattern mixture model to handle zero-inflation and incompleteness in a longitudinal setting. *Biometrical Journal*, 53: 716-734.

41. I. Martinez-Zarzoso and A. Maruotti (2011) The impact of urbanization on CO2 emissions: Evidence from developing countries. *Ecological Economics*, 70: 1344-1353.
42. M. Alfò, A. Maruotti and G. Trovato (2011). A finite mixture model for multivariate counts under endogenous selectivity. *Statistics and Computing*, 21: 185-202.
43. F. Belloc, A. Maruotti and L. Petrella (2011). How individual characteristics affect university students drop-out: a semiparametric mixed approach to an Italian case study. *Journal of Applied Statistics*, 10: 2225-2239.
44. M. Alfò and A. Maruotti (2010). Two-part regression model for longitudinal zero-inflated count data. *The Canadian Journal of Statistics*, 38: 197-216.
45. F. Belloc, A. Maruotti and L. Petrella (2010). University drop-out: an Italian experience. *Higher Education*, 60: 127-138.
46. M. Alfò and A. Maruotti (2009). A selection model for longitudinal binary responses subject to non-ignorable attrition. *Statistics in Medicine*, 28: 2435-2450.
47. A. Maruotti (2009). Fairness of National Health Service in Italy: a bivariate correlated random effects model. *Journal of Applied Statistics*, 36: 709-722.
48. A. Maruotti and T. Rydèn (2009). A semiparametric approach to hidden Markov models under longitudinal observations. *Statistics and Computing*, 19: 381-393.

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MEDICAL  
JOURNAL  
PUBLICATIONS

1. G.B. Smith, O. Redfern, A. Maruotti, A. Recio-Saucedo, P. Griffiths (2020). The association between nurse staffing levels and a failure to respond to patients with deranged physiology: a retrospective observational study in the UK. *Resuscitation*, to appear.
2. C. Dall’Ora, A. Maruotti, P. Griffiths (2020) Temporary staffing and patient death in acute care hospitals: A retrospective longitudinal study. *Journal of Nursing Scholarship*, 52: 210–216.
3. P. Griffiths, A. Maruotti, A. Recio-Saucedo, O. Redfern, J.E. Ball, J. Briggs, C. Dall’Ora, P.E. Schmidt, G.B. Smith (2019) Nurse staffing, nursing assistants and hospital mortality: retrospective longitudinal cohort study. *BMJ Quality & Safety*, 28: 609–617.
4. O. Redfern, P. Griffiths, A. Maruotti, A. Recio-Saucedo, G. Smith, The Missed Care Study Group (2019) The association between nurse staffing levels and the timeliness of vital signs monitoring: a retrospective observational study. *BMJ Open*, 9:e032157.
5. C. Dall’Ora, J. Bale, O. Redfern, A. Recio Saucedo, A. Maruotti, P. Meredith, P. Griffiths (2019) Are long nursing shifts on hospital wards associated with sickness absence? A longitudinal retrospective observational study: nurses’ 12-hour shifts and sickness absence. *Journal of Nursing Management*, 27: 19–26.
6. C. R. Cederroth, S. Gallus, D. A. Hall, T. Kleinjung, B. Langguth, A. Maruotti, M. Meyer, A. Norena, T. Probst, R. C. Pryss, G. Searchfield, G. S. Shekhawat, M. Spiliopoulou, S. Vanneste and W. Schlee (2019). Towards an Understanding of Tinnitus Heterogeneity. *Frontiers in Aging Neuroscience*, 11:53.
7. P. Griffiths, J. Ball, K. Bloor, D. Böhning, J. Briggs, C. Dall’Ora, A.D. Iongh, J. Jones, C. Kovacs, A. Maruotti, P. Meredith, D. Prytherch, A. Recio-Saucedo, O. Redfern, P. Schmidt, N. Sinden and G. Smith (2018) Nurse staffing levels, missed vital signs and mortality in hospitals: retrospective longitudinal observational study. *Health Services and Delivery Research*, 6(38).
8. D. Magri, P. Agostoni, G. Sinagra, F. Re, M. Correale, G. Limongelli, E. Zachara, V. Mastromarino, C. Santolamazza, M. Casenghi, G. Pacileo, F. Valente, M. Morosin, B. Musumeci, E. Pagannone, A. Maruotti, M. Uguccioni, M. Volpe, C. Autore (2018) Clinical and prognostic impact of chronotropic incompetence in patients with hypertrophic cardiomyopathy. *International Journal of Cardiology*, 271: 125–131.
9. A. Recio-Saucedo, A. Maruotti, P. Griffiths, G. Smith, P. Meredith, G. Westwood, C. Fogg, P. Schmidt (2018) Relationships between healthcare staff characteristics and the conduct of vital signs observations at night: results of a survey and factor analysis. *Nursing Open*, 5: 621–633.

10. P. Griffiths, A. Recio-Saucedo, C. Dall’Ora, J. Briggs, A. Maruotti, P. Meredith, G.B. Smith and J. Ball (2018) The association between nurse staffing and omissions in nursing care: a systematic review. *Journal of Advanced Nursing*, 74: 1474–1487.
11. M. Mazur, S. Westland, F. Guerra, D. Corridore, M. Vichi, A. Maruotti, G.M. Nardi and L. Ottolenghi (2018) Objective and subjective aesthetic performance of Icon treatment for enamel hypomineralization lesions in young adolescents: a retrospective single center study. *Journal of Dentistry*, 68: 104–108.
12. A. Recio-Saucedo, C. Dall’Ora, A. Maruotti, J. Ball, J. Briggs, P. Meredith, O.C. Redfern, C. Kovacs, D. Prytherch, G.B. Smith and P. Griffiths (2018). What impact does nursing care left undone have on patient outcomes? Review of the literature. *Journal of Clinical Nursing*, 27: 2248–2259.
13. G.M. Nardi, M. Mazur, D. Corridore, M. Capocci, F. Rinaldo, A. Maruotti, L. Ottolenghi and F. Guerra (2018). Clinical comparison between an opaque and a clear pit and fissures sealants: a 12-month split-mouth, randomized controlled study. *Clinica Terapeutica*, 169:e5-9.
14. M.B. Musumeci, V. Mastromarino, M. Casenaghi, G. Tini, P. Francia, A. Maruotti, A. Romaniello, D. Magri, R. Lillo, C. Adduci, M. Volpe, C. Autore (2017). Pulmonary hypertension and clinical correlates in hypertrophic cardiomyopathy. *International Journal of Cardiology*, 248: 326–332.
15. D. Magri, C. Santolamazza, L. Limite, V. Mastromarino, M. Casenghi, P. Orlando, E. Pagannone, M.B. Musumeci, A. Maruotti, A. Ricotta, G. Oliviero, G. Piccirillo, M. Volpe, C. Autore (2017). QT spatial dispersion and sudden cardiac death in hypertrophic cardiomyopathy: time for reappraisal. *Journal of Cardiology*, 70: 310–315.
16. P. Griffiths, J. Ball, J. Drennan, C. Dall’Ora, J. Jones, A. Maruotti, C. Pope, A. Recio Saucedo, M. Simon (2016). Nurse staffing and patient outcomes: strengths and limitations of the evidence to inform policy and practice. A review and discussion paper based on evidence reviewed for the National Institute for Health and Care Excellence Safe Staffing guideline development. *International Journal of Nurse Staffing*, 63: 213–225.
17. C.F. Guerra, D. Corridore, M. Mazur, F. Rinaldo, F. Mergé, D. Pasqualotto, M. Vichi, A. Maruotti, G.M. Nardi, L. Ottolenghi (2016). Early caries detection: comparison of two procedures. A pilot study. *Senses & Sciences*, 3: 317–322.
18. D. Magri, F. Re, G. Limongelli, P. Agostoni, E. Zachara, M. Correale, V. Mastromarino, C. Santolamazza, M. Casenghi, G. Pacileo, F. Valente, M. Morosin, M. Musumeci, E. Pagannone, A. Maruotti, M. Uguccioni, M. Volpe, C. Autore (2016). Heart failure progression in hypertrophic cardiomyopathy. Possible insights from cardiopulmonary exercise testing. *Circulation Journal*, 80: 2204–2211.
19. C.N. De Cecco, M. Ciolina, B. Annibale, M. Rengo, D. Bellini, G. Muscogiuri, A. Maruotti, L. Saba, F. Iafrate and A. Laghi (2016). Prevalence and distribution of colonic diverticula assessed with CT colonography (CTC). *European Radiology*, 26: 639–645.
20. D. Magri, G. Limongelli, F. Re, P. Agostoni, E. Zachara, M. Correale, V. Mastromarino, C. Santolamazza, M. Casenghi, G. Pacileo, F. Valente, B. Musumeci, A. Maruotti, M. Volpe and C. Autore (2016). Cardiopulmonary exercise test and sudden cardiac death risk in hypertrophic cardiomyopathy. *Heart*, 102: 602–609.
21. D. Magri, G. Piccirillo, A. Ricotta, C.N. De Cecco, V. Mastromarino, A. Serdoz, G. Muscogiuri G, M. Gregori, M. Casenghi, F.M. Cauti, G. Oliviero, M.B. Musumeci, A. Maruotti and C. Autore (2015). Spatial QT dispersion predicts nonsustained ventricular tachycardia and correlates with confined systolic dysfunction in hypertrophic cardiomyopathy. *Cardiology*, 131: 121–129.
22. D. Magri, P. Agostoni, U. Corrà, C Passino, D. Scrutinio, P. Perrone-Filardi, M. Correale, G. Cattadori, M. Metra, D. Girola, M. F Piepoli, A.M. Iorio, M. Emdin, R. Raimondo, F. Re, M. Cicoira, R. Belardinelli, M. Guazzi, G. Limongelli, F. Clemenza, G. Parati, M. Frigerio, M. Casenghi, A.B. Scardovi, A. Ferraironi, A. Di Lenarda, M. Bussotti, A. Apostolo, S. Paolillo, R. La Gioia, P. Gargiulo, P. Palermo, C. Minà, S. Farina, E. Battaia, A. Maruotti, G. Pacileo, M. Contini, F. Oliva, R. Ricci, G. Sinagra, on behalf of the Metabolic Exercise test data combined with Cardiac and Kidney Indexes (MECKI) Score Research Group (2015) Deceptive meaning of oxygen uptake measured at the anaerobic threshold in patients with systolic heart failure and atrial fibrillation. *European Journal of Preventive Cardiology*, 22: 1046–1055.

23. D. Magri, C. Banfi, A. Maruotti, S. Farina, C. Vignati, E. Salvioni, M. Morosin, M. Brioschi, S. Ghilardi, E. Tremoli and P. Agostoni (2015). Plasma immature form of surfactant protein type B correlates with prognosis in patients with chronic heart failure. A pilot single-center prospective study. *International Journal of Cardiology*, 201: 394–399.
24. D. Magri, C. N. De Cecco, G. Piccirillo, V. Mastromarino, A. Serdoz, G. Muscogiuri, A. Ricotta, M. Gregori, L. Marino, F. Cauti, E. Pagannone, B. Musumeci, A. Maruotti and C. Autore (2014) Relationship between myocardial repolarization dispersion and late gadolinium enhancement in patients with hypertrophic cardiomyopathy. *Circulation Journal*, 78: 1216–1223.
25. D. Magri, U. Corrà, A. Di Lenarda, G. Cattadori, A. Maruotti, A. Iorio, A. Mezzani, P. Giannuzzi, V. Mantegazza, E. Gondoni, G. Sinagra, M. F. Piepoli, C. Fiorentini and P. Agostoni (2014). Cardiovascular mortality and chronotropic incompetence in systolic heart failure. The importance of a reappraisal of current cut-off criteria. *European Journal of Heart Failure*, 16:201–209.
26. D. Magri, F.M. Cauti, P. Agostoni, G. Assenza, C. N. De Cecco, G. Muscogiuri, A. Maruotti, A. Ricotta, E. Pagannone, B. Musumeci, L. Marino, D. Santini, G. Proietti, M. Volpe and C. Autore (2014). Determinants of peak oxygen uptake in patients with hypertrophic cardiomyopathy: a single-center study. *Internal and Emergency Medicine*, 9: 293–302.
27. S. Sparabombe, F. Guerra, A. Maruotti, R. De Sanctis, G. Di Giorgio, G. Palaia, U. Romeo and E. Barbato (2013). Validity and reliability of a new instrument for the evaluation of dental collaboration in disabled people. *Epidemiology, Biostatistics and Public Health*, vol. 10, n.4, doi:10.2427/13.
28. G. Piccirillo, D. Magri, M.A. Pappadà, A. Maruotti, M. Ogawa, S. Han, B. Joung, P. Rossi, B.L. Nguyen, S.F. Lin, P.S. Chen (2012). Autonomic nerve activity and the short term variability of  $T_{peak} - T_{end}$  interval in dogs with pacing-induced heart failure. *Heart Rythm*, 9: 2044-2050.

REFEREED BOOK  
CHAPTERS

1. A. Maruotti and O. Anan (2017). The Conway-Maxwell-Poisson distribution and capture-recapture count data, in *Capture-Recapture Methods for Social and Medical Sciences*, D. Böhning, P. van der Heijden and J. Bunge (eds.), CRC-Press.
2. M. Bencivenga, F. Lagona, A. Maruotti, G. Nardone and M. Picone (2016). Unsupervised classification of multivariate time series data for the identification of sea regimes, in *Topics in Theoretical and Applied Statistics*, G. Alleva and A. Giommi (eds.), Springer-Verlang.
3. A. Pierini and A. Maruotti (2014). A multivariate stochastic volatility model for portfolio risk estimation, in *Advances in Latent Variables*, M. Carpita, E. Brentari and E.M. Quannari (eds.), Springer-Verlag
4. F. Belloc, A. Maruotti and L. Petrella (2012). A correlated random effects model for longitudinal data with non-ignorable drop-out: an application to university student performance, in *Advanced Statistical Methods for the Analysis of Large Data-Sets*. A. Di Ciaccio, M. Coli, J.M. Angulo Ibanez (eds.), Springer-Verlag.
5. F. Lagona, A. Maruotti and M. Picone (2011). A non-homogeneous hidden Markov model for the analysis of multi-pollutant exceedances data, in *Hidden Markov Models: Theory and Applications*, P. Dymarski (ed.), Intech-Publisher.
6. M. Alfò and A. Maruotti (2010). A hierarchical model for time dependent longitudinal data, in *Studies in Classification, Data Analysis and Knowledge Organization*. C. Lauro, F. Palumbo (eds), Springer-Verlang.

OTHER REFEREED  
PUBLICATIONS

- P. Borgia, A. Maruotti and F. Spandonaro (2005). Costi delle forme di assistenza sanitaria integrativa e prospettive di sviluppo. *Sanità Pubblica e Privata*, Gennaio – Febbraio 2005. Maggioli Editore
- F.S.Mennini, A. Maruotti et al. (2004). Monitoraggio della Spesa Sanitaria. *Salute e Territorio*, XXV Luglio-Agosto 2004.

INVITED  
CONFERENCE  
TALKS

- A. Maruotti, F.S. Mennini, L. Piasini and F. Spandonaro (2004). Equity and Fairness of National Health Service in Italy, in *Health Report 2004*, V. Atella, A. Donia Sofio, F.S. Mennini, F. Spandonaro (eds), Italtpromo.
- P. Borgia, A. Maruotti and F. Spandonaro (2004) Supplementary health care assistance: an analysis of the current market and the impact on public accounts, in *Health Report 2004*, V. Atella, A. Donia Sofio, F.S. Mennini, F. Spandonaro (eds) , Italtpromo.
- A. Maruotti, M. Ranalli and R. Rocci (2019). Composite likelihood inference for simultaneous clustering and dimensionality reduction of mixed-type longitudinal data. CLADAG 2019.
- A. Maruotti and M. Ranalli (2019). Autoregressive random effects models for circular longitudinal data using the embedding approach. GRASPA 2019.
- A. Maruotti, A. Punzo and J. Bulla (2018). On modelling multivariate high-dimensional time series: a factorial hidden Markov model. MBC2 2018.
- A. Maruotti and G. Mastrantonio (2018). Circular state-space models for time dependent data. ISBA 2018.
- A. Maruotti, A. Punzo and S. Ingrassia (2017). Multivariate hidden Markov regression models with random covariates. CLADAG 2017.
- A. Maruotti (2017). Hidden Markov models: dimensionality reduction, atypical observations and algorithms. SIS 2017.
- A. Maruotti (2017). Robust clustering of longitudinal circular data. TIES 2017.
- A. Punzo and A. Maruotti (2015). On the use of the contaminated Gaussian distribution in Hidden Markov models for longitudinal data. CLADAG 2015
- A. Maruotti and A. Punzo (2015). Model-based time-varying clustering of multivariate longitudinal data with covariates and outliers. Epigenetics & Mathematics: French-Norwegian AURORA Brainstorming workshop. Berlin, 28-31 Oct 2015
- A. Maruotti, J. Bulla, F. Lagona, F. Martella, M. Picone (2014). Parsimonious hidden Markov models for analyzing multivariate ecological time series. ERCIM 2014.
- A. Maruotti (2013) Handling initial conditions in dynamic binary panel data models. 10e Journèe d'Economie de l'Ensaï.
- F. Martella and A. Maruotti (2013) Hidden Markov of factor analyzers for biclustering of microarray time course data in multiple conditions. ERCIM 2013.
- A. Maruotti (2013) A general framework for robust fitting of hidden Markov models. ERCIM 2013.
- M. Bernardi, A. Maruotti and L. Petrella (2013) Multivariate Markov-switching models for tail risk interdependence. ERCIM 2013.
- A. Maruotti (2013) Alternative solutions to the initial conditions problem in dynamic binary panel data models with time-dependent unobserved heterogeneity. SIS 2013.
- A. Maruotti (2012) Modelling Longitudinal Data with Non-ignorable Dropouts using Hidden Markov Models: a conditional maximum likelihood approach. 6e Journèe d'Economie de l'Ensaï.
- A. Maruotti, F. Martella (2012) Clustering Multivariate Longitudinal Data: Hidden Markov of Factor Analyzers. SIS 2012.
- J. Bulla, F. Lagona, A. Maruotti, M. Picone (2012) A hidden Markov model for clustering mixed linear and circular data with missing values. Workshop on Stochastic Weather Generators. Roscoff.
- A. Maruotti, W. Zucchini (2010) A latent-state GAMLSS for multivariate pollutant concentrations. ERCIM 2010.
- A. Maruotti, R. Rocci (2010) A semiparametric approach to mixed nonhomogeneous hidden markov models. SIS 2010
- F. Lagona, A. Maruotti, M. Picone (2010) Hidden Markov Models for incomplete multivariate environmental data. TIES 2010

- M. Ötting, R. Langrock, A. Maruotti (2019) A copula-based multivariate hidden Markov model for modelling momentum in football. IWSM 2019.
- M. Ötting, R. Langrock, A. Maruotti (2019) A copula-based multivariate hidden Markov model for modelling momentum in football. DAGStat 2019.
- C. Azevedo, D. Böhning, A. Maruotti (2017) An application of mixture models to estimate the size of Salmonella infected flock data through the EM algorithm using validation information. International Workshop on Statistical Modelling, Groningen 3-7 July 2017.
- O. Anan, D. Böhning, A. Maruotti (2016) Population size estimation and heterogeneity in capture-recapture data. 48th Scientific Meeting of the Italian Statistical Society
- F. Lagona, A. Maruotti, M. Picone (2012) A multivariate hidden Markov model for space-time circular data. ERCIM2012.
- I. Martinez-Zarzoso, A. Maruotti (2011) Heterogeneity and time-dependence of an environmental Kutznets curve for CO<sub>2</sub>. EAERE2011
- F. Lagona, A. Maruotti, M. Picone (2010) Mixtures of truncated distributions for validating marine data. TIES2010
- M. Alfö, A. Maruotti (2009) Two-part Regression Models for longitudinal zero-inflated count data. International Symposium in Statistics (ISS) on Inferences in Generalized Linear Longitudinal Mixed Models. St. John's – Canada.
- F. Lagona, A. Maruotti (2009) A Hurdle Markov model for pollutants concentrations. TIES 2009. Bologna.
- A. Maruotti, R. Rocci (2009) A semiparametric approach to mixed nonhomogeneous hidden markov models. CLADAG 2009. Catania.
- M. Alfö, A. Maruotti, G. Trovato (2009) A finite mixture model for multivariate counts under endogenous selectivity. IFCS 2009. Dresda.
- A. Maruotti, L. Petrella (2008) A Semiparametric model for the probability of university drop-out: an Italian experience. Statistical Modelling for University Evaluation: an International Overview, Foggia.
- F. Lagona, A. Maruotti (2008), Model based indexes for air quality: a multivariate non-homogeneous hidden Markov model. The 19th International Conference of Environmental Statistics, Kelowna.
- F. Lagona, A. Maruotti (2008), Model-based air quality indexes. GRASPA Conference, Siena.
- R. Rocci, A. Maruotti (2007), An Indscal based mixture model. CLADAG 2007, Macerata.
- M. Alfö, A. Maruotti (2007), A hierarchical model for time dependent longitudinal data. CLADAG 2007, Macerata.
- M. Alfö, A. Maruotti, (2007), Semiparametric models for longitudinal binary response with attrition. International Workshop of Statistical Modeling 2007. Barcellona.
- L. Clementi, A. Maruotti, (2007) An empirical investigation of health care efficiency in Italy, Valutazione e Customer Satisfaction per la Qualità dei Servizi, Facoltà di Economia, Roma.
- L. Clementi, A. Maruotti, (2006) Data Envelopment Analysis approach: an application to Italian hospitals, COMPSTAT 2006, Roma.
- A. Maruotti, T. Rydén, (2006), Random effects regression model for mixture of hidden Markov models, COMPSTAT 2006, Roma.
- M. Alfö, A. Maruotti (2006), Mixed Effects Regression Models for Zero-inflated Poisson Data: Is the Hurdle Model Necessary?, GFKL 2006, Berlino.
- M. Alfö, A. Maruotti, G. Trovato (2005), A Self-selection Model for Bivariate Counts, Modelli Complessi e Metodi Computazionali per la Stima e la Previsione, SCO2005, Bressanone.



PRESENTATIONS  
AT SEMINARS

- Robust hidden (semi-)Markov models with applications to social and financial data, Università Commerciale Luigi Bocconi, 2018.
- Parsimonious hidden Markov models for analyzing multivariate ecological time series, University of Bergen, 2015.
- Alternative solutions to the initial conditions problem in dynamic binary panel data models, Georg-August-Universität Göttingen, 2013.
- Mixed hidden Markov models: an overview, Georg-August-Universität Göttingen, 2013.
- Data tell us a story, are we good enough to model it? University of Southampton, 2012.
- A hidden Markov model for clustering mixed linear and circular data with missing values, Université de Caen, 2011.
- Mixed hidden Markov models: an overview, Université de Rouen, 2011.
- “Fairness of National Health Service in Italy: a bivariate correlated random effects model, Institut für Statistik und Ökonometrie, Georg-August-Universität Göttingen, 2010.
- “How individual characteristics affect university students drop-out: a semiparametric mixed approach to an Italian case study”. Dipartimento di Studi Internazionali - Università di Roma Tre, 2009
- “EM algorithm in hidden Markov models (HMMs)”, Lund University, 2006.
- “Switching Markov Regression models”, Lund University, 2006.
- “Efficiency indicators in health economics”, Sapienza Università di Roma, 2006.

FUNDED PROJECTS Statistical modelling and inference for (high-dimensional) financial data (2020 - P.I.) - funded by Research Council of Norway, 598.000 NOK.

Nonlinear dependence and time dynamics in financial markets (2016, co-P.I.) - funded by Research Council of Norway, 200.000 NOK.

Identifying nurse-staffing requirements using the Safer Nursing Care Tool. Modelling the costs and consequences of real world application to address variation in patient need on hospital wards (2016, co-P.I.) - funded by NIHR, 559.230 Pounds.

Nurse staffing levels, missed vital signs observations and mortality in hospital wards: modelling the consequences and costs of variations in nurse staffing and skill mix. Retrospective observational study using routinely collected data (2015, co-P.I.) - funded by NIHR: 490.648 Pounds.

Metodi statistici a variabili latenti per lo studio di fenomeni ambientali - Latent class models for the analysis of environmental data (2015, P.I.) - funded by the University of Roma Tre: 7K Euros.

Analisi statistica e validazione automatica di dati mareografici mediante modelli miscuglio e variabili latenti markoviane a componenti spaziali e temporali - Statistical analysis and automatic validation of data by using mixture models and hidden Markov models with spatial and temporal components (2012, co-P.I.) - funded by ISPRA: 18K Euros.

Sviluppo di procedure standard per imputazioni di valori mancanti con finalità di validazione ed integrazione di dati estratti dalle reti di misura del servizio mareografico dell'ISPRA - Development of standard procedures for imputations of missing values aiming at validating and integrating data extracted from the ISPRA network (2009, co-P.I.) - funded by ISPRA: 20K Euros.

PARTICIPATION IN  
RESEARCH  
PROJECTS

Environmental processes and human activities: capturing their interactions via statistical methods (2016, P.I. Daniela Cocchi) - funded by MIUR: PRIN 2015.

Modellazione e analisi statistica dell'impatto e del rischio per fenomeni ambientali con componenti spaziali e temporali (2008, P.I. Francesco Lagona) - funded by MIUR: PRIN 2006-2008.

Metodologie statistiche per la valutazione del sistema universitario (2007, P.I. Lea Petrella) - funded by Sapienza Università di Roma.

Overcoming the barriers and seizing the opportunities for Active Aging in Europe (2005, P.I. Sandro Turcio) - funded by EU Commission: fifth framework programme.

Size – Life Quality of Seniors Citizens in Relation to Mobility Conditions (2005, P.I. Lucia Martincigh)  
- funded by EU Commission: fifth framework programme

ASI – Assess implementations in the frame of the Cities-of-Tomorrow programme(2005, P.I. Lucia Martincigh) - funded by EU Commission: fifth framework programme

Nuove ipotesi di finanziamento e budgeting dei DSM e costi per il superamento degli OPG (2004, P.I. Federico Spandonaro) - funded by Agenzia per i Servizi Sanitari Regionali (ASSR), .

Progetto SINDIS: Modelli per un set di indicatori standardizzati per il monitoraggio per la spesa ed il finanziamento dell’assistenza sanitaria (2004, P.I. Francesco Saverio Mennini) funded by Istituto Superiore di Sanità (ISS).

#### PRIZES

2015 Davidson Honorable Mention Award for the Best Article in Volume 89 (2013) of the *Journal of Retailing* (“Capturing the Evolution of Customer-Firm Relationships: How Customers Become More (or Less) Valuable Over Time” has been voted by the Advisory Board, Associate Editors, and Editorial Review Board as the best article in Volume 89 )

#### EDITORIAL SERVICE

*Biometrical Journal* (**Assistant Editor: July 2015 to present**)

*Plos One* (**Statistical Advisory Board: August 2016 to present**)

*METRON* (**Special Issue Editor: Hidden Markov Models: theory and applications**)

*Frontiers* (**Special Topic Editor: Towards an Understanding of Tinnitus Heterogeneity**)

#### REFEREE SERVICE

- *Journal of the Royal Statistical Society - Series B*
- *Journal of the American Statistical Association*
- *Annals of Applied Statistics*
- *Statistical Science*
- *Biometrical Journal*
- *Computational Statistics and Data Analysis*
- *Journal of Nonparametric Statistics*
- *International Statistical Review*
- *Statistical Methods in Medical Research*
- *Econometrics and Statistics*
- *Journal of Applied Statistics*
- *Information Sciences*
- *Advances in Data Analysis and Classification*
- *Statistical Methods and Applications*
- *British Journal of Mathematical and Statistical Psychology*
- *Communications in Statistics - Theory and Methods*
- *Ecological Economics*
- *Geographical Analysis*
- *Journal of Statistical Computation and Simulation*
- *Journal of Biometrics and Biostatistics*
- *Population and Environment*
- *Scientific Research and Essay*
- *Technological Forecasting & Social Change*
- *Proceedings of the National Academy of Sciences of the United States of America*

#### CONFERENCE SERVICE

Organizer of the invited session: “Statistical models for directional and circular data”, SIS 2016, Salerno, Italy.

Organizer of the invited session: “Recent developments in latent variable models with environmental applications”, GRASPA 2015, Bari, Italy.

Local organising committee: GRASPA 2015 - Statistical Applications to Environmental Problems

Organizer of the invited session: “Hidden Markov Models: Theory Developments and Applications”, CLADAG 2011, Pavia, Italy.

Local organising committee: “Valutazione e Customer Satisfaction per la Qualità dei Servizi”, Roma, Università di Roma Tor Vergata, 12-13 Aprile 2007.

PhD STUDENTS SUPERVISED	<p>Orasa Anan (University of Southampton). Topic: Capture-recapture data analysis; completed</p> <p>Alberto Vidal-Diez (University of Southampton). Topic: Capture-recapture data analysis; completed</p> <p>Gianluca Mastrantonio (Università di Roma Tre). Topic: Circular data analysis, latent class models and Bayesian statistics; completed</p>
ACADEMIC RESPONSIBILITIES	<p><b>LUMSA</b>, Roma, Italy Member of the University Quality Committee (Membro del Presidio di Qualità di Ateneo)</p> <p>Erasmus coordinator for the Dept. GEPLI</p> <p>Member of the University Sport Committee (Membro della Commissione Sport di Ateneo)</p> <p>Responsible for the Quality of Teaching at the Dept. GEPLI (Referente AQ di Dipartimento per la Didattica)</p>
TEACHING EXPERIENCE	<p><b>LUMSA</b>, Roma, Italy <i>Lecturer</i> <span style="float: right;"><b>October 2015 to present</b></span></p> <ul style="list-style-type: none"> <li>• Probability and Statistics, 1st year students</li> <li>• Data mining and analytics, 2nd year students</li> <li>• Statistical methods for social statistics , 2nd year students</li> <li>• Econometrics, 3rd year students</li> <li>• Statistical methods for finance, 4th year students</li> </ul> <p><b>LUISS</b>, Roma, Italy <i>Lecturer</i> <span style="float: right;"><b>October 2018 to present</b></span></p> <ul style="list-style-type: none"> <li>• Statistics, Master in Corporate Finance and Banking (Luiss Business School)</li> <li>• Econometrics and Statistics, Master in General Management (Luiss Business School)</li> <li>• Econometrics, Master in Big Data (Luiss Business School)</li> <li>• Time-series Econometrics, Master in Big Data (Luiss Business School)</li> </ul> <p><i>Teaching Assistant</i> <span style="float: right;"><b>September 2008 to 2012</b></span></p> <ul style="list-style-type: none"> <li>• Statistics, 1st year students</li> </ul> <p><b>Università di Roma Tre</b>, Roma, Italy <i>Lecturer</i> <span style="float: right;"><b>March 2010 to September 2016</b></span></p> <ul style="list-style-type: none"> <li>• Statistics, 1st year students</li> <li>• Statistical Modelling, 3rd year students</li> </ul> <p><i>Teaching Assistant</i> <span style="float: right;"><b>February 2008 to February 2010</b></span></p> <ul style="list-style-type: none"> <li>• Statistics, 1st year students</li> </ul> <p><b>Università di Roma "Tor Vergata"</b>, Roma, Italy <i>Teaching Assistant</i> <span style="float: right;"><b>September 2008 to July 2009</b></span></p> <ul style="list-style-type: none"> <li>• Statistics, 1st year students</li> </ul> <p><i>Teaching Assistant</i> <span style="float: right;"><b>September 2004 to July 2006</b></span></p> <ul style="list-style-type: none"> <li>• Mathematical finance, 1st year students</li> </ul> <p><i>Lecturer</i> <span style="float: right;"><b>September 2004 to July 2005</b></span></p> <ul style="list-style-type: none"> <li>• Quantitative instruments for economics and management, graduate students</li> </ul>

**University of Southampton**, Southampton, UK

*Lecturer*

**February 2013 to 2016**

- Short Course - Advanced Statistical Methods in Epidemiology

*Lecturer*

**June 2013 to 2016**

- Short Course - Linear Mixed Models with Applications in Medicine

*Lecturer*

**November 2013 to 2016**

- Short Course - Generalized Linear Mixed Models with Applications in Medicine

*Lecturer*

**September 2012 to June 2014**

- Statistical computing (MATH6152/MATH6030)

*Teaching Assistant*

**September 2012 to June 2014**

- Statistics for Engineering Systems (MATH6115)

**Sapienza Università di Roma**, Roma, Italy

*Teaching Assistant*

**September 2005 to 2015**

- Multivariate Statistics, 3rd year students
- Inferential statistics, 2nd year students
- Statistics, 1st year students

*Lecturer*

**September 2007 to 2012**

- Statistics in medicine, 5th year students

MEMBERSHIPS

- Southampton Statistical Sciences Research Institute (S3RI)
- European Research Consortium for Informatics and Mathematics (ERCIM), Working Group on Mixture models
- Italian Statistical Society
- Research Group for Statistical Applications to Environmental Problems
- Classification and Data Analysis Group of the Italian Statistical Society