Antonio Pievatolo, CV

19th October 2021

Education

- 1994 – 1997 PhD in Statistics, University of Padua
- 1986 – 1992 Degree in Statistical and Economic Sciences, University of Padua

Positions held with CNR IMATI[†]

- 01/01/2020 Director of Research
- 18/11/2019 Senior Researcher
- 23/12/2014 Head of the IMATI Milano Section
- 01/04/1997 Researcher

Research interests

Applications of statistics in industry: analysis of failure data, power systems, prototyping experiments, process monitoring.
Methods: point and Markov processes, state-space models, Monte Carlo simulation

Research projects

(as unit coordinator [UC] or participant [P])

- 2016 – 2018 [UC] *Third framework agreement between Regione Lombardia and CNR: I-ZEB, Intelligent Zero-Energy Buildings*. Activity: statistical inference on the parameters of RC models for the heat transfer in buildings.
- 2016 [UC] *MIUR-CNR Factory of the Future Flagship Project: ShredIT, A Self-Optimizing Shredding Station for Demanufacturing Plants*;
  2013–2015 *MIUR-CNR Factory of the Future Flagship Project: Zero Waste PCBs - Integrated technological solutions for zero waste recycling of printed circuit boards*. Activity: modelling the particle size at the output of a shredding machine, experimental design for fast model parameter estimation, optimisation of process parameters.
- 2013–2015 [P] *MIUR-CNR Factory of the Future Flagship Project: NanoTwice, Nanocomposite nanofibres for treatment of air and water by an industrial conception of electrospinning*. Activity: design and statistical analysis of electrospinning experiments.
- 2013 – 2015 [UC] *Second framework agreement between Regione Lombardia and CNR: INTEGRATE, Innovazioni Tecnologiche per una Gestione Razionale del Tessuto Edilizio*. Activity: more accurate estimation of error in gauge R&R studies on acoustic insulation in buildings.
- 2013 – 2015 [UC] *Second framework agreement between Regione Lombardia and CNR: FIDEAS, Smart Factory for Sustainable and Advanced De-production*. Activity: surrogate modelling and optimal design of corona electrostatic separation of metal and plastic particles.

[†]Consiglio Nazionale delle Ricerche, Istituto di Matematica Applicata e Tecnologie Informatiche "E. Magenes" – National Research Council of Italy, Istitute for Applied Mathematics and Information Technologies "E. Magenes" (`https://www.imati.cnr.it`)

- 2002 – 2004 [UC] *PRO-ENBIS, European network for promoting business and industrial statistics*, a Thematic Network of the EU 5th Framework Program. Activity: consortium building for the promotion of statistics in business and industry.

Industrial projects

- Analysis of field failure data of domestic appliances for failure type monitoring, product recall decisions, failure forecasting before warranty expiration.
- Statistical analysis of data transmission success rate by electronic power meters in a large test electric power system.

Teaching

- 2016 – 2019 Applied Regression, PhD in Statistics, Bocconi University
- 2001 – 2009 Graduate courses in Statistical inference, Engineering curricula, Politecnico di Milano
- 2006 – 2008 Graduate courses in Statistical inference, Statistical Sciences curriculum, Milano Bicocca University

Students

PhD

- Sajid Ali (2016) *Stochastic models for high-quality process monitoring*. PhD in Statistics, Bocconi University.
- Raffaele Argiento (2007) *Bayesian semiparametric inference for accelerated failure time models*. PhD in Statistics, Bocconi University.
- Daniele Amberti (2006) *European electricity market: a multi-level model of demand for forecasting purposes with application to an Italian operator*. PhD in "Cultura e Impresa, metodi e modelli statistici", University of Turin.

Internship

- Romain Benassi (IMT Atlantique, 2008) *Study of large covariance matrix inversion in the framework of linear prediction*.
- Vivien Fa-Si-Oen (Eindhoven Technical University, 1998) *Reliability study of gas pipelines*.

Master

- Roberto Pensa (2015) *Particle filters: an application to the forecasting of failure of domestic appliances*. Mathematical Engineering, Politecnico di Milano.
- Fabio Zambelli (2011) *Bayesian inference for time series via nonparametric priors on the spectral density*. Mathematical Engineering, Politecnico di Milano.
- Silvia Re (2007) *Inspection and maintenance of oil plants: probabilistic models and optimal management policies*. System Engineering, Politecnico di Milano.
- Baris Hancioglu (2002) *Variance reduction techniques in Monte Carlo simulation*. Mathematics, University of Milan.
- Clara Ursella (1999) *Statistical analysis of the reliability of distribution networks*. Mathematics, University of Milan.
- Roberto Spreafico (1999) *Analysis of failure data of railway equipment*. Management Engineering, Politecnico di Milano.

Other scientific activities

- 2019 – 2021 Past-President of ENBIS, the European Network for Business and Industrial Statistics
- 2017 – 2019 President of ENBIS
- 2015 – 2017 President-Elect of ENBIS
- 2013 – 2015 Vice-President of ENBIS
- since 2008, Associate Editor of *Applied Stochastic Models in Business and Industry*
- Member of the program committee of the annual ENBIS conference in 2011, 2017, 2018, 2019, 2020, 2021. Co-chair of the program committee in 2015.
- Member of the scientific committee of the BISP workshop series (Bayesian Inference for Stochastic Processes), in 2007, 2009, 2011, 2013, 2017, 2019.
- Member of the scientific committee of the GDRR Symposium (Games and Decisions in Risk and Reliability) in 2013, 2015, 2017, 2019.

Publications

[1] A. Rotondi, P. Pedroni, and A. Pievatolo. *Probabilità, Statistica e Simulazione, Programmi applicativi scritti in R, 4a edizione*. Springer, 2021.

[2] A. Pievatolo, F. Ruggeri, R. Soyer, and S. Wilson. Decisions in risk and reliability: An explanatory perspective. *Stats*, 4(2):228–250, 2021.

[3] S. Pasquali, A. Pievatolo, A. Bodini, and F. Ruggeri. A stochastic sir model for the analysis of the covid-19 italian epidemic. *arXiv preprint arXiv:2102.07566*, 2021.

[4] A. Bodini, S. Pasquali, A. Pievatolo, and F. Ruggeri. Underdetection in a stochastic sir model for the analysis of the covid-19 italian epidemic. *Stochastic Environmental Research and Risk Assessment*, pages 1–19, 2021.

[5] A. Pievatolo and B. De Ketelaere. The ENBIS-19 Quality and Reliability Engineering International special issue, foreword. *Quality and Reliability Engineering International*, 36(8):2593–2594, 2020.

[6] A. Lepore, B. Palumbo, and A. Pievatolo. A bayesian approach for site-specific wind rose prediction. *Renewable Energy*, 150:691–702, 2020.

[7] A. Pievatolo, D. Ríos Insua, and S. Wilson. Special issue of asmbi for gddr 2017. *Applied Stochastic Models in Business and Industry*, 35(3):398–398, 2019.

[8] M. Diani, A. Pievatolo, M. Colledani, and E. Lanzarone. A comminution model with homogeneity and multiplication assumptions for the waste electrical and electronic equipment recycling industry. *Journal of Cleaner Production*, 211:665–678, 2019.

[9] G. Copani, M. Colledani, A. Brusaferri, A. Pievatolo, E. Amendola, M. Avella, and M. Fabrizio. Integrated technological solutions for zero waste recycling of printed circuit boards (pcbs). In *Factories of the Future*, pages 149–169. Springer, Cham, 2019.

[10] C. Scrosati, A. Pievatolo, and M. Garai. The uncertainty declaration of building acoustics measurements: How to select the uncertainty of reproducibility from inter-laboratory tests. *Acta Acustica united with Acustica*, 104(2):295–303, 2018.

[11] A. Pievatolo. A nonlinear state-space model for the forecasting of field failures. In *50th Scientific meeting of the Italian Statistical Society*, 2018.

[12] S. Ali and A. Pievatolo. Time and magnitude monitoring based on the renewal reward process. *Reliability Engineering & System Safety*, 179:97–107, 2018.

[13] M. Borrotti, E. Lanzarone, F. Manganini, S. Ortelli, A. Pievatolo, and C. Tonetti. Defect minimization and feature control in electrospinning through design of experiments. *Journal of applied polymer science*, 134(17), 2017.

[14] S. Grillo, A. Pievatolo, and E. Tironi. Optimal storage scheduling using markov decision processes. *IEEE Transactions on Sustainable Energy*, 7(2):755–764, 2016.

[15] S. Coleman, R. Göb, G. Manco, A. Pievatolo, X. Tort-Martorell, and M. S. Reis. How can smes benefit from big data? challenges and a path forward. *Quality and Reliability Engineering International*, 32(6):2151–2164, 2016.

[16] M. Borrotti, A. Pievatolo, I. Critelli, A. Degiorgi, and M. Colledani. A computer-aided methodology for the optimization of electrostatic separation processes in recycling. *Applied Stochastic Models in Business and Industry*, 32(1):133–148, 2016.

[17] M. Borrotti and A. Pievatolo. A multi-objective bayesian sequential design based on pareto optimality. In *mODa 11-Advances in Model-Oriented Design and Analysis*, pages 47–54. Springer, Cham, 2016.

[18] S. Ali, A. Pievatolo, and R. Göb. An overview of control charts for high-quality processes. *Quality and reliability engineering international*, 32(7):2171–2189, 2016.

[19] S. Ali and A. Pievatolo. High quality process monitoring using a class of inter-arrival time distributions of the renewal process. *Computers & Industrial Engineering*, 94:45–62, 2016.

[20] R. Göb, K. Lurz, and A. Pievatolo. More accurate prediction intervals for exponential smoothing with covariates with applications in electrical load forecasting and sales forecasting. *Quality and Reliability Engineering International*, 31(4):669–682, 2015.

[21] R. Argiento, P. G. Bissiri, A. Pievatolo, and C. Scrosati. Multilevel functional principal component analysis of facade sound insulation data. *Quality and Reliability Engineering International*, 31(7):1239–1253, 2015.

[22] I. Epifani, L. Ladelli, and A. Pievatolo. Bayesian estimation for a parametric markov renewal model applied to seismic data. *Electronic Journal of Statistics*, 8(2):2264–2295, 2014.

[23] R. Argiento, A. Guglielmi, and A. Pievatolo. Estimation, prediction and interpretation of ngg random effects models: an application to kevlar fibre failure times. *Statistical Papers*, 55(3):805–826, 2014.

[24] A. Pievatolo and R. Argiento. A two-state duration model of electricity co-generation in residential applications with time-dependent covariates. In *ISBA Regional Meeting and International Workshop/Conference on Bayesian Theory and Applications (IWCBTA)*, 2013.

[25] R. Göb, K. Lurz, and A. Pievatolo. Rejoinder to the discussions of the paper on 'electrical load forecasting by exponential smoothing with covariates'. *Applied Stochastic Models in Business and Industry*, 29(6):652–658, 2013.

[26] R. Göb, K. Lurz, and A. Pievatolo. Electrical load forecasting by exponential smoothing with covariates. *Applied Stochastic Models in Business and Industry*, 29(6):629–645, 2013.

[27] A. Pievatolo, F. Ruggeri, and R. Soyer. A bayesian hidden markov model for imperfect debugging. *Reliability Engineering & System Safety*, 103:11–21, 2012.

[28] V. Musolino, A. Pievatolo, and E. Tironi. A statistical approach to electrical storage sizing with application to the recovery of braking energy. *Energy*, 36(11):6697–6704, 2011.

[29] A. Frigessi, A. Løland, A. Pievatolo, and F. Ruggeri. Statistical rehabilitation of improper correlation matrices. *Quantitative Finance*, 11(7):1081–1090, 2011.

[30] R. Argiento, R. Faranda, A. Pievatolo, and E. Tironi. Distributed interruptible load shedding and micro-generator dispatching to benefit system operations. *IEEE Transactions on Power Systems*, 27(2):840–848, 2011.

[31] A. Pievatolo, F. Ruggeri, and R. Soyer. A bayesian hidden markov model for software failures. In *The Fifth International Workshop in Applied Probability*, 2010.

[32] A. Pievatolo and F. Ruggeri. Bayesian modelling of train door reliability. *The Oxford Handbook of Applied Bayesian Analysis*, page 271, 2010.

[33] R. Benassi, A. Pievatolo, and R. Göb. An l-banded approximation to the inverse of symmetric toeplitz matrices. *Economic Quality Control*, 25(1):13–30, 2010.

[34] R. Argiento, A. Guglielmi, and A. Pievatolo. Mixed-effects modelling of kevlar fibre failure times through bayesian non-parametrics. In *Complex data modeling and computationally intensive statistical methods*, pages 13–26. Springer Milan, 2010.

[35] R. Argiento, A. Guglielmi, and A. Pievatolo. Bayesian density estimation and model selection using nonparametric hierarchical mixtures. *Computational Statistics & Data Analysis*, 54(4):816–832, 2010.

[36] A. Pievatolo. A semiparametric bayesian mixed-effects model for failure time data. In *S.Co. 2009, Complex Data Modeling and Computationally Intensive Statistical Methods for Estimation and Prediction*, pages 17–22. P. za Leonardo da Vinci 32, Politecnico di Milano, 2009.

[37] R. Argiento, A. Guglielmi, and A. Pievatolo. A semiparametric bayesian mixed-effects model for failure time data. *Proc. SCo*, pages 17–22, 2009.

[38] R. Argiento, A. Guglielmi, and A. Pievatolo. A comparison of nonparametric priors in hierarchical mixture modelling for aft regression. *Journal of statistical planning and inference*, 139(12):3989–4005, 2009.

[39] A. Pievatolo and R. Rotondi. Statistical identification of seismicity phases. *Geophysical Journal International*, 173(3):942–957, 2008.

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[54] A. Pievatolo, F. Ruggeri, and R. Argiento. Bayesian analysis and prediction of failures in underground trains. *Quality and Reliability Engineering International*, 19(4):327–336, 2003.

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[63] C. Gaetan and A. Pievatolo. Change-point analysis in stochastic processes. In *International Workshop on Statistical Modelling, Orvieto*, 1996.