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# Book of the Short Papers

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Carlo Cavicchia, Rosanna Verde**



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| Nonparametric functional prediction bands: theory with an application to bike sharing mobility demand in the city of Milan<br><i>Jacopo Diquigiovanni, Matteo Fontana and Simone Vantini</i>       | 1873        |
| An R package for the statistical process monitoring of functional data<br><i>Christian Capezza, Fabio Centofanti, Antonio Lepore, Alessandra Menafoglio, Biagio Palumbo and Simone Vantini</i>     | 1878        |
| Trend filtering for functional regression<br><i>Federico Ferraccioli, Alessandro Casa and Marco Stefanucci</i>   | 1884        |
| Conformal prediction for spatio-functional regression models<br><i>Diana, Romano, Irpino</i>   | 1890        |
| <b>Tourism and sport studies</b>   | <b>1895</b> |
| Assessing satisfaction of tourists visiting Italian museums: evidence from the eWOM<br><i>Daria Mendola and Valentina Oddo</i>   | 1896        |
| COVID-19 pandemic and tourism demand: a comparison between Spain and Italy<br><i>Caterina Sciortino, Ludovica Venturella and Stefano De Cantis</i>   | 1902        |
| A compositional analysis of tourism in Europe<br><i>Francesco Porro</i>  | 1908        |
| Improving administrative data quality on tourism using Big Data<br><i>Antonella Bianchino, Armando d'Aniello and Daniela Fusco</i>   | 1914        |
| <b>Geographical variations of socio-demographic issues</b>   | <b>1920</b> |
| Elderly HCE and health care need: comparing spatially unexplained levels<br><i>Irene Torrini, Laura Rizzi and Luca Grasseti</i>  | 1921        |
| Measuring sustainable development at the regional level. The case of Italy<br><i>Marianna Bartiromo and Enrico Ivaldi</i>  | 1927        |
| Socio-economic deprivation and COVID-19 infection: a Bayesian spatial modelling approach<br><i>Antonino Abbruzzo, Andrea Mattaliano, Alessandro Arrigo, Salvatore Scondotto and Mauro Ferrante</i> | 1933        |
| <b>Applications in Economics</b>   | <b>1939</b> |
| The measurement of economic security through relative indicators<br><i>Alessandro Gallo, Silvia Pacei and Maria Rosaria Ferrante</i>   | 1940        |



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| A regional analysis of the efficiency by energy's producers in Italy<br><i>Gianna Greca, Giuseppe Cinquegrana and Giovanni Fosco</i>   | 1946        |
| On investigating social and financial aspects of Cardano<br><i>Stefano Vacca, Marco Ortu, Gianpaolo Zammarchi and Giuseppe Destefanis</i>  | 1953        |
| Combined permutation test on the effect of age of micro enterprises on the propensity to Circular Economy<br><i>Stefano Bonnini and Michela Borghesi</i>                                   | 1959        |
| Comparison of Two Different Approaches to Measure Economic Access to Food and Insecurity: an Application to Mexican data<br><i>Stefano Marchetti, Luca Secondi and Adrian Vargas-Lopez</i> | 1965        |
| <b>Image analysis and visual methods</b>   | <b>1971</b> |
| Bias correction of the maximum likelihood estimator for Emax model at the interim analysis<br><i>Caterina May and Chiara Tommasi</i>   | 1972        |
| Visual and automated methods in digital microscopy to evaluate fungal colonisation on plant roots<br><i>Ivan Sciascia, Andrea Crosino and Andrea Genre</i>                                 | 1977        |
| From satellite images to road pavement type: an object-oriented classification approach<br><i>Arianna Burzacchi, Matteo Landrò and Simone Vantini</i>                                      | 1983        |
| Valid inference for group analysis of functionally aligned fMRI images<br><i>Angela Andreella, Riccardo De Santis and Livio Finos</i>  | 1987        |
| Topological persistence for astronomical image segmentation<br><i>Riccardo Ceccaroni, Pierpaolo Brutti, Marco Castellano, Adriano Fontana and Emiliano Merlin</i>                          | 1993        |
| <b>Statistical assessment and empirical estimation</b>   | <b>1999</b> |
| Confidence regions for optimal sensitivity and specificity of a diagnostic test<br><i>Gianfranco Adimari, Duc-Khanh To and Monica Chiogna</i>  | 2000        |
| On the sensitiveness to the memory parameter in the network of tennis<br><i>Alberto Arcagni, Vincenzo Candila and Rosanna Grassi</i>   | 2006        |
| Two-part model with measurement error<br><i>Maria Felice Arezzo, Serena Arima, and Giuseppina Guagnano</i>   | 2011        |
| Statistical assessment of practical significance<br><i>Andrea Ongaro, Sonia Migliorati, and Enrico Ripamont</i>  | 2017        |
| <b>Autoregressive and mixed effects models</b>   | <b>2023</b> |
| Asymptotic Properties of the Nonlinear Least Squares Estimator in HE-HAR Models<br><i>Emilija Dzuverovic and Edoardo Otranto</i>   | 2024        |

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| A note on testing for threshold non-linearity in presence of heteroskedasticity in time series<br><i>Simone Giannerini and Greta Goracci</i>   | 2030        |
| The conditional autoregressive Whart-G model<br><i>Massimiliano Caporin and Marco Girardi</i>  | 2036        |
| Semi-parametric generalized linear mixed effects models for binary response for the analysis of heart failure hospitalizations<br><i>Alessandra Ragni, Chiara Masci, Francesca Ieva and Anna Maria Paganoni</i>  | 2042        |
| <b>Issues in Data science</b>  | <b>2048</b> |
| etree: Classification and Regression With Structured and Mixed-Type Data in R<br><i>Riccardo Giubilei, Tullia Padellini and Pierpaolo Brutti</i>   | 2049        |
| Deep Learning framework for ungrouping coarsely aggregated vital rates<br><i>Andrea Nigri</i>  | 2055        |
| Inside the metaverse: analysis of the state of the art and development of a new usage approach based on quality and ethics<br><i>Vito Santarcangelo, Emilio Massa, Saverio Gianluca Crisafulli, Antonio Ruoto, Angelo Lamacchia, Alessandro D'Alcantara, Alessandro Verderame and Massimiliano Giacalone</i> | 2061        |

# Preface

This book includes the contributions presented at the 51st Scientific Meeting of the Italian Statistical Society (SIS) held in Caserta at the Università della Campania “Luigi Vanvitelli”, from the 22nd to 24th of June, 2022.

The conference has registered more than 300 presentations, including 4 keynotes in plenary invited sessions and 9 presentations in 3 guest sessions, 48 presentations collected in 16 specialized sessions and 68 presentations in 17 solicited sessions, all dealing with specific themes in methodological and/or applied statistics and demography. Furthermore, more than 200 contributions, with one or more authors, have been spontaneously submitted to the Program Committee and arranged in 43 contributed sessions.

The high number of contributions and the large participation at the conference show that researchers have met the challenge of pursuing working even in the face of the pandemic period from which we are only now emerging. The research activity in our field therefore has never stopped, and the desire to participate in scientific events, as a place for exchange and discussion on new developments in our field, remains a living characteristic of our scientific community.

With the publication of this book, we wish to offer to all members of the Italian Statistical Society, all international academics, researchers, Ph.D. students, and all interested practitioners, a good snapshot of the on-going research in the statistical and demographic fields. We deeply thank all contributors for having submitted their works to the conference and all the researchers for their remarkable job in acting as referees accurately and timely. We also would like to thank the International Biometric Society (IBS) – Italian region, the European Network for Business and Industrial Statistics (ENBIS) and the Italian Society of Statistical Physics (SIFS) we had the pleasure of hosting. A special thanks is addressed to the Scientific and Organizational Committees for their great efforts devoted to all the organizational aspects, to the Università della Campania “Luigi Vanvitelli” and to the Department of Mathematics and Physics who made this event possible, as well as to the Municipality of the Town of Caserta who has patronized the event and to all the funders for their supports.

Finally, we wish to express our gratitude to the publisher Pearson Italia for all the support received.