

Contents

Solicited Session SS1 – Compositional Data Analysis	
Organizer and Chair: Gianna Monti	1
Rieser C. and Filzmoser P.. <i>Compositional Data and graph theory</i>	2
Egozcue J. J., Pawlowsky-Glahn V. and Buccianti A. <i>Compositional deviations from linear and non-linear equilibria</i>	8
Monti G. S. and Filzmoser P. <i>The knockoff filter for FDR control in robust ZeroSum regression in microbiome analysis</i>	14
Solicited Session SS2 - Monitoring progress towards SDGs: statistical approaches and methods for measuring poverty, inequalities and food insecurity	
Organizer and Chair: Luca Secondi	18
Marchetti S., Giusti C., Pratesi M. and Biggeri L. <i>Poverty indicators adjusted using local price indexes</i>	19
Tonutti G., Bertarelli G., Giusti C. and Pratesi M. <i>Assessing the targeting of the anti-poverty measure “Reddito di Cittadinanza” using Small Area Estimation methods</i>	25
Vargas-Lòpez A. and Secondi L. <i>Household consumption and food insecurity in Mexico: COVID19 and sustainable development</i>	31
Session of free contributes SCL1 – Big Data, Proximity data, Multi way data	
Chair: Donatella Vicari	37
Metulini R. and Carpita M. <i>Forecasting Traffic Flows with Complex Seasonality using Mobile Phone Data</i>	38
Simonacci V., Menini T. and Gallo M. <i>CP decomposition of 4th-order tensors of compositions</i>	44
Bove G. <i>A strategy of analysis of symmetry and skew-symmetry in asymmetric relationships</i>	50
Session of free contributes SCL2 –Industry and Society	

Chair: Germana Scepi	56
Crosato L., Domenech J. and Liberati C. <i>Toward an early detection of SME's default with websites' indicators</i>	57
Angelone R. <i>Italians' Culture and Values after two years of pandemic</i>	63
Aria M., Cuccurullo C., D'Aniello L. and Spano M. <i>Thematic evolution of Academic Medical Centers' research: a focus on Italian public owned AOUs in metropolitan areas</i>	67
Session of free contributes SCL3 – Society and Tourism	
Chair: Emma Zavarrone	73
Rondinelli R., Palazzo L. and Ievoli R. <i>Local clustering coefficient to measure intra-regional tourism in Italy</i>	74
Zavarrone E., M. and Forciniti A. <i>Local clustering coefficient to measure intra-regional tourism in Italy</i>	80
Firza N. <i>Sustainable tourism: The case of Albania</i>	86
Romano M., Zammarchi G. and Conversano C. <i>Threshold-based Naïve Bayes Classifier Customer Satisfaction evaluation</i>	90
Session of free contributes SCL4 –Society and Innovation	
Chair: Michelangelo Misuraca	95
Seri E., Alaimo L. S., di Bella E., Cataldo R. and Piscitelli A. <i>Migrant Integration Policy Index (MIPEX): an analysis of countries via Gaussian mixture modelbased clustering</i>	96
Rossi L. and Daddi S. <i>The measure of the BES: a proposal for the aggregation of the indicator education and training</i>	102
Marino M., Mazza R., Misuraca M. and Stavolo A. <i>Monitoring consumer sentiment using control charts</i>	108
Session of solicited contributes SS3 – Statistical methods for the assessment of student careers in higher education	
Organizer and Chair: Maria Prosperina Vitale	114
La Rocca M., Niglio M. and Restaino M. <i>Predicting university students' churn risk</i>	115
Primerano I., Santelli F. and Usala C. <i>Discovering archetypal universities in Italian higher education mobility flows</i>	121
Cascella C. and Ragozzini G. <i>Measuring quality of students' careers in Higher Education: a systematic literature review</i>	127
Porcu M., Sulis I. and Usala C. <i>Estimating the peers effect on students' university choices</i>	134

Session of solicited contributes SS4 – Conformity assessment and quality predictions- itENBIS	
Organizer and Chair: Amalia Vanacore	140
Vanacore A., Pellegrino M. S. and Ciardiello A. <i>Testing the predictive performance of multi-class classifiers</i>	141
Borgoni R., Gilardi A. and Zappa D. <i>Optimal Subgrids from Spatial Monitoring Networks</i>	148
Pennecchi F. and Kuselman I. <i>Extension of the JCGM 106:2012 - Conformity assessment of multicomponent items and finite statistical samples</i>	153
Session of solicited contributes SS5 – Big Data and Large-dimensional Data	
Organizer and Chair: Stefania Mignani	160
Farné M. and Vouldis A. <i>ROBOUT: a conditional outlier detection methodology for large-dimensional data</i>	161
Camillo F. <i>Behaviours, emotions and opinions in modern citizen or customer relationship systems: a correct integration of small and big data for hyper-targeting, personal advertising and look-alike</i>	168
Camminatiello I. and Lucadamo A. <i>A model for assessing sea environmental quality</i>	172
Session of solicited contributes SS6 – Health Quality	
Organizer and Chair: Paolo Mariani	178
Bartolini B., Bertoldi S., Benedan L., Galeone C., Mariani P., Sofia F. and Zenga M. <i>The uneasiness index in a patient-designed quality of life questionnaire</i>	179
Benedan L., Hachem M. E., Galeone C., Mariani P., Pilo C. and Tadini G. <i>Assessing the Quality of Life of patients with Epidermolysis Bullosa (EB): Development of a patient-centered questionnaire</i>	184
Marletta A. and Morandi M. <i>Survival analysis in a business context: how to control the abandons of my subscribers</i>	190
Session of free contributes SCL5 – Assessing Performance	
Chair: Cristina Davino	194
di Trapani G. <i>Political performance measuring and tracking through a system based on the Political Performance Indicator (Iep): Naples 2021 case</i>	195
Montanari G. E. and Doretti M. <i>A class of case-mix adjusted probability-based indices for performance evaluation</i>	202

Cavicchia C., Sarnacchiaro P., Vichi M. and Zaccaria G. <i>An ultrametric model to build a Composite Indicators system</i>	208
Session of free contributes SCL6 – Statistical Learning	
Chair: Massimo Aria	212
Migliorati M. and Brentari E. <i>Feature definition for NBA result prediction through Deep Learning</i>	213
Levantesi S., Lizzi M. and Nigri A. <i>An application of contrast trees for mortality models diagnostic and boosting</i>	219
Aria M., Gnasso A. and D'Aniello L. <i>Twenty Years of Random Forest: preliminary results of systematic literature review</i>	225
Park H., Hong J., Shin Y. and Park J-S. <i>A study on the GEV activation function for classification of class imbalance data</i>	231
Session of free contributes SCL7 – Society and Disparity	
Chair: Pasquale Sarnacchiaro	236
Alaimo L. S., D'Urso P. and Nigri A. <i>The gender gap in lifespan disparity as a social indicator of international countries: A fuzzy clustering analysis approach</i>	237
Iannario M. and Tarantola C. <i>Modelling scale effects via a Bayesian approach: an application to decision making in public sector</i>	243
Gangi F. , Daniele L. M. and Coscia M. <i>Board Gender Diversity and Social engagement: evidence from the banking industry</i>	249
Session of free contributes SCL8 – Education	
Chair: Matilde Bini	256
Davino C. and Lamberti G. <i>Assessing heterogeneity in students' performance. The case of the Massive Open Online Courses</i>	257
Primerano I., Catone M. C., Giordano G. and Vitale M. P. <i>Assessing undergraduate students' perceptions of distance learning during the COVID-19 pandemic</i>	263
Crisci A., Lucadamo A. and Amenta P. <i>PhD satisfaction analysis in Italian University via Classification tree, Bagging and Random Forest</i>	269
Cervellera S., Cusatelli C. and Giacalone M. <i>Comparative Analysis of Student Learning: Technical, Methodological and Result Assessing of PISA-OECD and INVALSI-Italian Systems</i>	275
Session of solicited contributes SS7 – SEM with PLS: Theory and Applications	
Organizer and Chair: Enrico Ciavolino	281

Wang S., Cheah J. and Roldan J. L. <i>PLS-SEM basics and its potential applications: A quick journey</i>	282
Cefis M. and Carpita M. <i>A PLS-SEM confirmatory composite analysis for football goalkeeper's performance validation</i>	288
Pasca P., Misuraca M., Meloni A. and Ciavolino E. <i>Text-mining and PLS-SEM combination to measure food satisfaction with Google Review: When the gut (re)counts!</i>	294
Session of solicited contributes SS8 – Applications of non standard statistical tools to real-life	
Organizer and Chair: Antonio D'Ambrosio	300
Iorio C. and Pandolfo G. <i>A robust strategy for building a financial portfolio</i>	301
Ruscone M. N. and De Luca G. <i>Conditional copula a financial application</i>	307
Ortu M., Frigau L. and Contu G. <i>Explaining Student Satisfaction Assessments: A Natural Language Processing Approach</i>	313
Session of solicited contributes SS9 – Innovation and Value Co-creation in Society	
Organizers and Chairs: Alessandra De Chiara & Anna D'Auria	319
Mauro S. <i>The smart working towards a Society 5.0</i>	320
Del Vacchio E., Carignani F., Laddaga C. and Bifulco F. <i>Innovative interaction in Society 5.0: insights from the cultural sector</i>	326
D'Auria A. and De Chiara A. <i>Society 5.0: a bibliometric analysis</i>	333
Session of solicited contributes SS10 – Statistical learning for mainstream press, health and fiscal data	
Organizer and Chair: Claudio Conversano	339
Baldassarre A. and Carullo D. <i>The regression trunk model for partitioning Italian municipalities based on their fiscal capacities and its determinants</i>	340
Pandolfo G. and Iorio C. <i>An analysis of Italian healthcare mobility through a depth-based clustering procedure</i>	346
Dossou B. F. P. and Wilhelm A. F. X. <i>Automatic Fake News Detection to Ensure Quality of News Articles</i>	352
Session of solicited contributes SS11 – Multi-way Methods for Evaluation Service	
Organizer and Chair: Michele Gallo	358
Simonacci V., Marino M., Grassia M. G. and Gallo M. <i>Multiple factor analysis with external information on PISA survey data</i>	359

Bocci L. and D. Vicari D. <i>A three-way analysis of well-being in Italy over time</i>	365
Cerqueti R., Mattera R. and Scepi G. <i>Multiway approach for clustering time series with time varying parameters</i>	371
Session of solicited contributes SS12 – Assessment of Management Quality	
Organizer and Chair: Clelia Fiondella	377
Belfiore A., Cuccurullo C. and Aria M. <i>Using partial triadic analysis for depicting the temporal evolution of Italian private healthcare organizations</i>	378
Bollani L., Celegato A., Barbero F. and Fontemaggi F. <i>Management of the human factor into the company. An experience from the aeronautic sector.</i>	385
Session of solicited contributes SS13 – New technologies for students learning assessment and evaluation	
Organizer and Chair: Alfonso Iodice D’Enza	391
Themelis E. and Markos A. <i>A non parametric cognitive diagnostic method in classroom assessment conditions</i>	392
Iannario M., Iodice D’Enza A. and Romano R. <i>Hybrid unfolding models to Likert-scale data to assess distance learning perception in higher education</i>	398
Pacella D., Fabbricatore R., Galluccio C. and Palumbo F. <i>Classification of Statistics learners using multi-dimensional latent class IRT model and archetypal analysis: the ALEAS app</i>	404
Session of solicited contributes SS14 – Labor Market and Enterprises	
Organizer and Chair: Lucio Masserini	408
Maggioni G., Mariani P., Marletta A. and Zenga M. <i>Searching for new trends and dynamics in Labour Market: a statistical approach for the recruiting process</i>	409
Bruttini P., Mariani P., Marletta A., Masserini L. and Zenga M. <i>A new definition of the professional figure Open Manager</i>	413
Session of solicited contributes SS15 – Statistical Approaches to Environmental Sustainability	
Organizer and Chair: Alfonso Piscitelli	417
Aspinall R. <i>Measuring sustainability as an emergent property of whole system dynamics</i>	418

Alaimo L. S. and Finocchiaro G. <i>Tourism sustainability in the Italian regions: a fuzzy approach</i>	424
D'Uggento A. M. <i>How young people perceive environmental issues, react to ecological concerns and commit themselves to sustainable behaviours</i>	430
Session of solicited contributes SS16 – Statistical Methods for Environmental, Natural Resources and Health Assessment	
Organizer and Chair: Alessio Pollice	437
Ferretti A., Ippoliti L. and Valentini P. <i>Spatial-ARFIMA models for the statistical analysis of environmental lattice processes</i>	438
Arima S., Pasculli G. and Polettini S. <i>A Bayesian non parametric approach for bias correction for underreported data</i>	444
Lasinio G. J., Mastrantonio G., Pollice A., Ventura D., Mancini G. and Ardizzone G. <i>Assessment of the impact of anthropic pressures on the Giglio island meadow of Posidonia oceanica</i>	450
Session of solicited contributes SS17 – Functional Data Analysis Methodologies for Quality Assessment	
Organizer and Chair: Elvira Romano	456
Fortuna F., Maturo F. and Di Battista T. <i>Improving the quality of questionnaires via the combined use of functional outlier detection and Item Response Theory</i>	457
Naccarato A., Fortuna F. and Terzi S. <i>Assessing government effectiveness over time: a functional data analysis approach</i>	462
Balzanella A. and Verde R. <i>Mining Distributed Acoustic Sensing data for vehicle traffic monitoring</i>	467
Session of solicited contributes SS18 – Evaluation and assessment of cognitive and learning processes	
Organizer and Chair: Francesco Palumbo	473
Ponticorvo M. and Argiulo T. <i>Neuropsychological Assessment supported by Technology: the E-BTT case</i>	474
Milano N. and Gigliotta O. <i>Mining Introducing OpenAi-ES in Interactive Data. Clustering with R-EVOK</i>	480
Davino C., Gherghi M., Palumbo F. and Vistocco D. <i>Modeling heterogeneity in student's satisfaction during the Covid-19 pandemic</i>	484
Session of solicited contributes SS19 – Substainability and Environment	
Organizer and Chair: Ida Camminatiello	490

Lombardo R. and Beh E. J. <i>Partitioning the Cressie-Read divergence statistic for three-way contingency tables: a study on environmental sustainability data</i>	491
Prahadchai T., Hong J., Busababodhin P. and Park J-S.. <i>Analysis of maximum precipitation in Thailand using non-stationary extreme value models</i>	498
Tregua M. and Scaglione M. <i>Assessing citizens' participation to urban transformation: a review of quantitative methods</i>	504
Session of solicited contributes SS20 – Statistical methods for health and environmental impact assessment	
Organizer and Chair: Fabrizio Maturo	512
Gattone S. A. and Di Battista T. <i>Density estimation via Functional Data Analysis</i>	513
Evangelista A., Acal C., Aguilera A. M., Sarra A., Di Battista T. and Palermi S. <i>A new multivariate functional ANOVA approach for assessing air quality data amid COVID-19 pandemic</i>	517
Diana A., Romano E. and Irpino A. <i>Conformal Prediction for Geographically Weighted Functional Regression models: an application for environmental impact assessment.</i>	523
Session of solicited contributes SS21 – Local sustainability assessment: challenges in building quality indicators	
Organizers and Chairs: Francesca Fortuna & Alessia Naccarato	529
Grimaccia E. <i>Urban Sustainability Assessment: A Proposal for an Index Based on SDGs' Indicators</i>	530
Liberati P. and Resce G. <i>Between and Within Country Inequality in Regional Well Being</i>	536
Di Battista T., Nissi E. and Sarra A. <i>Equitable and sustainable well-being over time: a functional approach</i>	542
Session of free contributes SCL9 – Health and Covid-19	
Chair: Maria Sole Pellegrino	548
Cao N., Calcagní A. and Finos L. <i>Twitter about COVID-19: An application of Structural Topic Models to a sample of Italian tweets</i>	549
Parretti C., Tartaglia R., Sbrana G., Mandó M. and Pacchi S. <i>Assessing the quality of a health service through the risk profile number (RPN)</i>	555
Di Lorenzo G., Franchetti G. and Politano M. <i>The insurance premium structure for a covid-19 insurance policy</i>	562

Session of solicited contributes SS22 – Statistics, culture and tourism	
Organizer and Chair: Marica Manisera	568
Cristiani P. <i>How data can influence the promotion and the consumption of cultural experience</i>	569
Carpita M., Manisera M. and Zuccolotto P. <i>Mobile phone data to monitor the impact of social and cultural events of Brescia</i>	575
Capecchi S., Quaranta G. and Salvia R. <i>Analysing opinions on sustainable tourism in the Vallo di Diano area, Campania, Italy</i>	582
Session of free contributes SCL10– Time Series data, Panel data and Circular Economy	
Chair: Anna Crisci	588
Scaccabarozzi D., Toninelli D., Zurlo D., Bacchini F. and Iannaccone R. <i>Testing the Participation Gap Inclusion within the Wage Phillips Curve</i>	589
Fusco D., Liguori M. A. and Moretti V. <i>Multisource approach for trends evaluation. An application at the agricultural sector</i>	596
Bonnini S. and Borghesi M. <i>A permutation test on the relationship between Circular Economy and firm size</i>	601
Mele S., Izzo F. and Tomnyuk V. <i>Circular economy and business models: a literature review</i>	607
Session of free contributes SCL11 –Modelling Extreme Values, High dimensional, time series data	
Chair: Violetta Simonacci	611
Shin Y., Busababodhin P. and Park J-S. <i>Modeling extreme values using the r-largest four parameter distribution</i>	612
Sabri M., Maturo F., Verde R., Riffi J. and Yahyaouy A. E. <i>Classification of ECG signals based on functional data analysis and machine learning techniques</i>	618
Park J-S., Shin Y., Shin Y. and Hong J. <i>Determining shape parameters in a climate multi-model ensemble</i>	624