Matteo Ventura

Research interests

2021 - Present

Graphical Models with Applications in Ecology

Application of Gaussian Graphical Models for investigating the structure of soil arthropods communities, and for studying the impact of various factors on the edaphic biodiversity of agroecosystems, in order to provide useful tools to support the decisions in the management and protection of biodiversity.

2022 - Present

Mixture Models for Ordinal Data

Improvement and application of models within the so-called CUB (Combination of discrete Uniform and shifted Binomial random variables) class of Models, which allows for the measurement of two latent traits: *feeling* and *uncertainty*. These models have broad applications, including in the fields of measuring visitor experience, sports analytics, and sensory analysis.
A first contribution in this field consisted in defining and studying the equivalence between the basic CUB and the CUM (Combination of discrete Uniform and linearly transformed Multinomial random variables). The second contribution consisted in developing a Multivariate CUB Model and a Model-based Clustering based on it.

Education

2021 - 2024

University of Brescia — PhD in Analytics for Economics and Management

Thesis title: *Advances in Mixture Models for Ordinal Data: Theoretical Insights and Model-based Clustering*
Supervisor: Prof. Paola Zuccolotto
Co-supervisor: Prof. Julien Jacques

Sep. 2023 – Jun. 2024

University of Lyon 2 — Visiting PhD student

Development of a mixture model for the analysis of rating data
Supervisor: Prof. Julien Jacques, director of ERIC Lab

2018 – 2020

University of Brescia — Master's degree in Business Administration

Thesis title: *Financial Markets and Social Networks: The Effects of Covid-19*
Supervisor: Prof. Maurizio Carpita
Final grade: 110/110 with honors

2015 – 2018

University of Brescia — Bachelor's degree in Business Administration

Thesis title: *The Merge of Non-profit Organizations*
Supervisor: Prof. Isabella Maffezzoni
Final Grade: 102/110

Experience

Nov. 2024 - Present **Postdoctoral Researcher** – University of Brescia

Activity carried out within the MICS project – Supervisor: Prof. Paola Zuccolotto
Development and application of Mixture Models for the analysis of multivariate rating data and the perception, behaviors and preferences of consumers and businesses.

Mar. 2021 - Present **Data Analyst** – Siderweb S.p.A.

Activity carried out in collaboration with DMS StatLab – Director: Prof. Maurizio Carpita
Collection of data related to the steel industry and their analysis using statistical indices for the steel market and industry analysis.

Feb. 2021 – Oct. 2021 **Junior Research Fellow** – University of Brescia

Activity carried out in collaboration with the Agrofood Lab – Director: Prof. Gianni Gilioli
Study and application of statistical models (Regression Models, Structural Equation Models, Graphical Models, Random Forests) to investigate the impact of several factors on the edaphic biodiversity of agroecosystems, to provide useful tools to support the decisions in the management and protection of biodiversity.

Teaching Activity

Teaching Assistant

Academic Year	Institution	Course	Professor in Charge	Duration
2024 - 2025	University of Brescia - DEM	Statistics	Prof. Marica Manisera	30 hours
	University of Brescia - DEM	Statistics	Prof. Ambra Macis	40 hours
2023 - 2024	University of Brescia – DEM	Statistics	Prof. Ambra Macis	40 hours
2022 - 2023	University of Brescia - DEM	Statistics	Prof. Marica Manisera	10 hours
	University of Bergamo - DISA	Statistics	Prof. Alessandro Fassò	18 hours
	University of Bergamo - DIGIP	Statistics	Prof. Alessandro Fassò	12 hours

Thesis Supervision

Co-supervisor

2024 Master's degree Thesis - *Statistic Analysis of Customers' Perception: Swarovski's Stores and Advertising Messages*

Master's degree Thesis - *Statistical analysis of slow tourism: focus on the Italian trails*

2023 Master's degree Thesis - *Spectral Clustering: analysis of the literature and application for the analysis of the visitor experience in an Art Gallery*

Publications

Indexed Journals (WoS, Scopus)

2025

1. Simonetto A., Ventura M., Distance Measures for Unweighted Undirected Networks: a comparison study, *Australian and New Zeland Journal of Statistic, In press.*

2024

2. Ventura M., Macis A., Manisera M, Zuccolotto P., (2024) On the equivalence of two mixture models for rating data, *Advances in Statistical Analysis*, 1-25.

3. Manisera M., Migliorati M., Ventura M., Zuccolotto P. (2024) A Mixture Model for the Analysis of Categorical Variables Measured on Five-point Semantic Differential Scales. *Austrian Journal of Statistics*. **53**(3), 70-86.

2022

4. Ventura M., Ricciardi R. (2022) Exploring Financial Microblogs: Analysis of Users' Trading Profiles with Multivariate Statistical Methods. *Statistica e Applicazioni*. **20**(1), 61-78.

2021

5. Ghiglieno I., Simonetto A., Sperandio G., Ventura M., Gatti F., Donna P., Tonni M., Valenti L., Gilioli G. (2021). Impact of Environmental Conditions and Management on Soil Arthropods Communities in Vineyard Ecosystems. *Sustainability*. ***13***(21), 11999.

Conference Proceedings

2024

1. Ventura M., Jacques J., Zuccolotto P. (2024) *Clustering Multivariate Rating Data within the CUB Framework. Short paper in A. Pollice and P. Mariani (Eds.), 52nd Scientific Meeting of the Italian Statistical Society – Bari, 17-20 June 2024, In press.*

2022

2. Simonetto A., Ventura M., Gilioli G. (2022) *An Explorative analysis of Different Distance Metrics to Compare Unweighted Undirected Networks. Short paper in A. Balzanella, M. Bini, C. Cavicchia, R. Verde (Eds.), 51st Scientific Meeting of the Italian Statistical Society – Caserta, 22-24 June 2022* (pp. 1522-1527). Pearson. ISBN: 9788891932310.

2021

3. Simonetto A., Ventura M., Ghiglieno I., Gatti F., Gilioli G. (2021) *Le Risposte della Biodiversità Edafica alla Gestione degli Agroecosistemi: un Approccio Basato sull'Ecological Network Anlaysis. Abstract in A. Elia & G. Conversa (Eds.), Agriculture, Environment and Health XIII National Congress on Biodiversity – Foggia, 7-9 September 2021* (p. 236). DAFNE, University of Foggia. ISBN: 9788874271016.

4. Ghiglieno, I., Simonetto, A., Sperandio G., Ventura M., Gatti F., Donna P., Tonni M., Valenti L., Gilioli G. (2021) *Impatto delle Condizioni Ambientali e della Gestione del Suolo sugli Artropodi Edafici dell'Ecosistema Vigneto. Abstract in A. Elia & G. Conversa (Eds.), Agriculture, Environment and Health XIII National Congress on Biodiversity – Foggia, 7-9 September 2021* (p. 123). DAFNE, University of Foggia. ISBN: 9788874271016.

Work in progress

1. Ventura M., Jacques J., Zuccolotto P., Model-based Clustering of Multivariate Rating Data accounting for Feeling and Uncertainty, *Submitted to the Journal of Classification*

2. Ventura M., Macis A, Manisera M. Zuccolotto P., Measuring synesthetic experience of museum visitors using multi-point semantic differential scales, *Submitted to the International Journal of Tourism Research*

Conference Contributions

Invited Talks

Speaker

1. Ventura M., Macis A., Manisera M., Zuccolotto P., *Synesthetic Experience in Museums: a Statistical Analysis based on Semantic Differential Scales*, 29th Nordic Conference in Mathematical Statistics (NORDSTAT), Gothenburg (Sweden), 19-22 June 2023.

Co-author

1. Macis A., Ventura M., Manisera M., Zuccolotto P., *Modeling Rating Data: Exploring the Relationship between CUB and CUM Models,* 29th Nordic Conference in Mathematical Statistics (NORDSTAT), Gothenburg (Sweden), 19-22 June 2023.

Contributed Talks

Speaker

1. Ventura M., Jacques J., Zuccolotto P., *Clustering Multivariate Rating Data within the CUB Framework*, 52nd Scientific Meeting of the Italian Statistical Society, Bari (Italy), 17-20 June 2024.

2. Ventura M., Macis A., Manisera M., Zuccolotto P., *A Mixture Modelling Approach to Enhance the Multisensory Experience of Museum Visitors*, Joint Conferences Data Science, Statistics and Visualisation (DSSV) and European Conference on Data Analysis (ECDA), Antwerp (Belgium), 5-7 July 2023.

Co-author

1. Macis A, Ventura M., Manisera M. Zuccolotto P., *Exploring the Equivalence of two Mixture Models for Rating Data in the CUB class*, Joint Conferences Data Science, Statistics and Visualisation (DSSV) and European Conference on Data Analysis (ECDA), Antwerp (Belgium), 5-7 July 2023.

2. Simonetto A., Ventura M., Gilioli G., *An Explorative analysis of Different Distance Metrics to Compare Unweighted Undirected Networks.* 51st Scientific Meeting of the Italian Statistical Society, Caserta (Italy), 22-24 June 2022.

3. Simonetto A. Ventura M., Ghiglieno I., Gatti F., Gilioli G., *Soil Biodiversity Responses to Agroecosystem Management: An Ecological Network Analysis Approach*, Agriculture, Environment and Health XIII National Congress on Biodiversity, Foggia (Italy), 7-9 September 2021.

4. Ghiglieno, I., Simonetto, A., Sperandio G., Ventura M., Gatti F., Donna P., Tonni M., Valenti L., Gilioli., *Impact of Environmental Conditions and Soil Management on Soil Arthropods in Vineyard Ecosystem*, Agriculture, Environment and Health XIII National Congress on Biodiversity, Foggia (Italy), 7-9 September 2021.

Posters

1. Ventura M., Jaccques J., Zuccolotto P., *A Mixture of Multivariate CUB Models for Clustering Rating Data*, 30th Summer Working Group on Model-Based Clustering (WGMBC), Bertinoro (Italy), 22-27 July 2024.

Workshops and Seminars

Speaker

1. Seminar "Advances in the Analysis of Human Perceptions within the CUB Framework, Polytechnic University of Catalonia, Barcelona (Spain), February 4th, 2025.
2. Workshop "*Statistical Methods and Models for Ordinal Data"*, University of Brescia, Brescia (Italy), May 25th, 2023.

Scientific Cooperation

- Member of the Italian Statistical Society (SIS)
- Member of the Young group of the Italian Statistical Society (y-SIS)

Research Projects

Participant

2024

1. **Characterizing and Measuring Visual Information Literacy**
   Founded by MUR (Ministero dell'Università e della Ricerca) and PRIN program
   Scientific coordinator: Prof. Angela Locoro
   Role: Research collaboration

   Description: Development of a model for characterizing and measuring the level of Visual Information Literacy by establishing an evaluation scale to analyze individual competencies in this field.

2. **MICS – Made in Italy Circolare e Sostenibile**
   Founded by MUR (Ministero dell'Università e della Ricerca) and PNRR program
   Scientific coordinator for UniBs: Prof. Emilio Sardini
   Role: Post-doc (Assegnista di Ricerca)

   Description: Development and application of Mixture Models to measure the perception of Made in Italy and Sustainability and the behaviors and preferences of consumers and businesses.

2022

3. **DS4BS – Data Science for Brescia - Arts and Cultural Places**
   Founded by Fondazione Cariplo within the grant "Data Science for Science and Society".
   Scientific coordinator: Prof. Marica Manisera
   Role: Research collaboration

   Description: Development and application of Mixture Models to analyze data on visitor behaviour at cultural sites in Brescia to improve their experience and attract more visitors, ultimately contributing to increased tourism and cultural activities in the region.

2021

4. **F.A.Re.Su.Bio. – Fertilità, Ambiente e Reddito attraverso Suolo e Biodiversità**
   Project under the PSR (Piano di Sviluppo Rurale) funded by Regione Lombardia
   Scientific coordinator for UniBs: Prof. G. Gilioli
   Role: Research collaboration

   Description: Application of machine learning models (random forests, CART, GLM), Structural Equation Models (SEM) and Graphical Models to investigate the relationships between soil biodiversity indicators (e.g., soil biological quality) and meteorological variables, vineyard management practices, and soil chemical-physical characteristics, providing decision support tools for biodiversity management in the wine sector.

5. **Development of a sampling protocol for *Anopheles spp*. and assessment of their potential role as vectors of emerging pathogens**
   Project funded by Ministry of Health
   Scientific coordinator for UniBs: Prof. G. Gilioli
   Role: Research collaboration

   Description: Application of machine learning models to assess the impact of meteorological and land use factors on predicting Anopheles mosquito population abundance and to evaluate the risk of their presence using landscape and meteorological data, with the goal of developing optimal sampling protocols.

Digital Skills

Microsoft | MS Office | R | Python | Latex | Lime Survey

Languages

Italian Native

	Comprehension		*Speaking*		*Writing*
	Listening	Reading	Spoken production	Spoken interaction	
English	B2	B2	B2	B2	B2
French	A2	A2	A2	A2	A2