

GIORGIA ZACCARIA

PERSONAL DATA

Date and Place of Birth July 6, 1994, Rome, Italy

Nationality Italian

✉ giorgia.zaccaria@unimib.it ◇ giorgia.zaccaria@unitelmasapienza.it

🌐 [Personal Page](#) ◇ [Institutional Page](#) ◇ [Google Scholar](#) ◇ [Research Gate](#) ◇ [ORCID](#)
◇ [Sapienza University of Rome](#) ◇ [LinkedIn](#)

EMPLOYMENT

Postdoctoral Research Fellow

October 2022 – Present

University of Milano Bicocca, Milan, Italy

Department of Statistics and Quantitative Methods

Supervisor: Prof. Francesca Greselin

Research Fellow

July 2021 – June 2022

University of Rome Unitelma Sapienza, Rome, Italy

Department of Law and Economics

Supervisor: Prof. Pasquale Sarnacchiaro

EDUCATION

Ph.D. in Methodological Statistics

November 2018 – February 2022

University of Rome La Sapienza, Rome, Italy

Final evaluation: Excellent

Department of Statistical Sciences

Thesis title: *Ultrametric models for hierarchical dimensionality reduction*

Supervisor: Prof. Maurizio Vichi

M.Sc. in Statistical and Decision Sciences

November 2016 – October 2018

Curriculum: European Master in Official Statistics (EMOS)

Final score: 110/110 cum laude

University of Rome La Sapienza, Rome, Italy

Department of Statistical Sciences

Thesis title: *Un modello gerarchico e parsimonioso per la costruzione di un indicatore composito di sviluppo sostenibile*

Supervisor: Prof. Maurizio Vichi

Internship

July 2018

Alleanza per lo Sviluppo Sostenibile (ASviS), Rome, Italy

B.Sc. in Statistics, Economics and Society

November 2013 – October 2016

University of Rome La Sapienza, Rome, Italy

Final score: 110/110 cum laude

Department of Statistical Sciences

Thesis title: *Tecniche di ricampionamento per l'inferenza non parametrica: il metodo bootstrap*

Supervisor: Prof. Marco Perone Pacifico

High School Diploma in Scientific Studies

September 2008 – July 2013

Liceo Scientifico Statale Aristotele, Rome, Italy

Final score: 100/100

Bilingual Diploma: English and French.

RESEARCH VISITS

Tilburg University, Tilburg, The Netherlands

November 2021 – January 2022

Department of Methodology and Statistics

Supervisor: Prof. Jeroen K. Vermunt

RESEARCH INTERESTS

Ultrametric Models

Dimensionality Reduction

Model-Based Clustering

Hierarchical Models

Robust statistics

Latent Variable Models

AWARDS, GRANTS & SCHOLARSHIP

Research Grant for Junior Researcher, "Avvio alla ricerca"

October 2020

University of Rome La Sapienza, Rome, Italy

Principal Investigator

Project title: *Hierarchical latent variable models for studying multidimensional phenomena in heterogeneous populations*

Research Grant for Medium Projects

October 2019

University of Rome La Sapienza, Rome, Italy

Investigator (Principal Investigator: Prof. Donatella Vicari)

Project title: *Models, methods and classification of transition data: analysis of the students mobility among degree courses of Italian universities*

Excellent Graduate Award

May 2019

Fondazione Roma Sapienza, Rome, Italy

Excellent Graduate of the Faculty of Information Engineering, Computer Science and Statistics, a.y. 2017/2018

Scholarship

November 2018

University of Rome La Sapienza, Rome, Italy

Ph.D. School of Statistical Sciences

Three years of Ph.D. scholarship

PUBLICATIONS (IN RED, THOSE SELECTED FOR THE EVALUATION)

REFERRED JOURNAL ARTICLES

4. Cavicchia, C., Sarnacchiaro, P., Vichi, M., **Zaccaria, G.** (2023) A model-based ultrametric composite indicator for studying waste management in Italian municipalities. *Computational Statistics*, doi: 10.1007/s00180-023-01333-9 ([link](#)).

3. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2022) Hierarchical Disjoint Principal Component Analysis. *AStA Advances in Statistical Analysis*, doi: 10.1007/s10182-022-00458-4 ([link](#)).

2. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2022) Gaussian mixture model with an extended ultrametric covariance structure. *Advances in Data Analysis and Classification*, 16(2), 399-427 ([link](#)).

1. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2020) The ultrametric correlation matrix for modelling hierarchical latent concepts. *Advances in Data Analysis and Classification*, 14(4), 837-853 ([link](#)).

ARTICLES EDITED IN VOLUMES AND PH.D. THESIS

3. Mingione, M., Vichi, M., **Zaccaria, G.** (2022) Complex Dimensionality Reduction: Ultrametric Models for Mixed-Type Data. In: L.A. Garcia-Escudero, A. Gordaliza, A. Mayo, M. Asunción Lubiano Gomez, M. Angeles Gil, P. Grzegorzewski, O. Hryniewicz (Eds.) *Building Bridges between Soft and Statistical Methodologies for Data Science. SMPS 2022. Advances in Intelligent Systems and Computing*, vol 1433. Springer, Cham. ISBN: 978-3-031-15508-6 ([link](#)).

2. **Zaccaria, G.** (2022) Ultrametric models for hierarchical dimensionality reduction. *Ph.D. thesis, XXXIV cycle* ([link](#)).

1. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2020) Exploring hierarchical concepts: theoretical and application comparisons. In: T. Imaizumi, A. Nakayama, S. Yokoyama, S. (Eds.). *Advanced Studies*

in *Behaviormetrics and Data Science. Behaviormetrics: Quantitative Approaches to Human Behavior*, vol. 5 (pp. 315-328). Springer, Singapore. ISBN: 978-981-15-2699-2 ([link](#)).

REFERRED CONFERENCE PROCEEDINGS

11. **Zaccaria, G.** (2023) Ultrametric Gaussian Mixture Models With Parsimonious Structures. In P. Coretto, G. Giordano, M. La Rocca, M.L. Parrella, C. Rampichini (Eds.). *Book of Abstract and Short Papers CLADAG 2023* (pp. 314-317). Pearson. ISBN: 978-88-9193-563-2.
10. Greselin, F., **Zaccaria, G.** (2023) Handling missing data in complex phenomena: an ultrametric model-based approach for clustering. In F. M. Chelli, M. Ciommi, S. Ingrassia, F. Mariani, M. C. Recchioni (Eds.). *Book of the Short Papers SIS 2023* (pp. 961-996). Pearson. ISBN: 978-88-9193-561-8AAVV.
9. **Zaccaria, G.**, Sarnacchiaro, P. (2022) An ultrametric model for building a composite indicator system to study climate change in European countries. In: A. Balzanella, M. Bini, C. Cavicchia, R. Verde. (Eds.). *Book of Short Papers SIS 2022* (pp. 970-974). Pearson. ISBN: 978-88-9193-231-0.
8. Cavicchia, C., Sarnacchiaro, P., Vichi, M., **Zaccaria, G.** (2022) An ultrametric model to build a Composite Indicators system. In: R. Lombardo, I. Camminatiello, V. Simonacci (Eds.). *Book of Short Papers, 10th International Conference IES 2022 Innovation & Society 5.0: Statistical and Economic Methodologies for Quality Assessment, Department of Economics, University of Campania L. Vanvitelli, January 27th - 28th 2022* (pp. 208-211). Sesto San Giovanni: PKE - Professional Knowledge Empowerment s.r.l. ISBN: 978-88-94593-35-8.
7. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2021) A parsimonious parameterization of a nonnegative correlation matrix. In: S. Ingrassia, A. Punzo, R. Rocci (Eds.). *MBC2 2020 Book of Short Papers of the 5th International Workshop on Models and Learning for Clustering and Classification, Catania* (pp. 21-26). Milano: Ledizioni. ISBN: 978-88-5526-539-3.
6. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2021) Model-based clustering with parsimonious covariance structure. In: G. C. Porzio, C. Rampichini, C. Bocci (Eds.). *CLADAG 2021 Book of Abstracts and Short Papers. 13th Scientific Meeting of the Classification and Data Analysis Group, Firenze, September 9-11, 2021* (pp. 296-299). Firenze: Firenze University Press. ISBN: 978-88-5518-340-6.
5. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2021) The ultrametric covariance model for modelling teachers' job satisfaction. In: C. Perna, N. Salvati, F. Schirripa Spagnolo (Eds.). *Book of Short Papers SIS 2021* (pp. 1319-1324). Pearson. ISBN: 978-88-9192-736-1.
4. **Zaccaria, G.**, Vichi, M. (2020) Exploring drug consumption via an ultrametric correlation matrix. In: A. Pollice, N. Salvati, F. Schirripa Spagnolo (Eds.). *Book of Short Papers SIS 2020* (pp. 372-377). Pearson. ISBN: 978-88-9191-077-6.
3. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2019) Dimensionality reduction via hierarchical factorial structure. In G. C. Porzio, F. Greselin, S. Balzano (Eds.). *Book of Short Papers, CLADAG 2019, 11-13 September 2019, Cassino* (pp. 116-119). Cassino: Centro Editoriale di Ateneo Università di Cassino e del Lazio Meridionale. ISBN: 978-88-8317-108-6.
2. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2019) A new hierarchical model-based composite indicator on climate change. In M. Bini, P. Amenta, A. D'Ambra, I. Camminatiello (Eds.). *Statistical Methods for Service Quality Evaluation, Book of Short Papers of IES 2019 in Roma, Italia, 4-5 July* (pp. 346-349). Cuzzolin. ISBN: 978-88-86638-65-4.
1. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2019) Hierarchical Clustering and Dimensionality Reduction for Big Data. In G. Arbia, S. Peluso, A. Pini, G. Rivellini (Eds.). *Smart Statistics for Smart Applications, Book of Short Papers SIS 2019* (pp. 173-180). Pearson. ISBN: 978-88-9191-510-8.

ONGOING PROJECTS

5. Greselin, F., **Zaccaria, G.** (2023+) Studying hierarchical latent structures in heterogeneous populations with missing information. *Revision required.*
4. Cavicchia, C., Vichi, M., **Zaccaria, G.** (2023+) Parsimonious Ultrametric Gaussian Mixture Models. *Under review.*
3. Uncovering data contamination: cellwise outlier detection in model-based clustering with missing data and constraints (w. Greselin, F. and Mayo-Isar, A.). *Manuscript in preparation.*
2. Fuzzy Spectral Data Embedding (w. Di Nuzzo, C.). *Manuscript in preparation.*
1. Ultrametric models for mixed-type data (w. Mingione, M. and Vichi, M.). *Manuscript in preparation.*

PRESENTATIONS AND SEMINARS

INVITED PRESENTATIONS

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|---|-----------------------|
| CMStatistics 2023 | <i>December 2023</i> |
| 16th International Conference of the ERCIM WG on Computational and Methodological Statistics HTW Berlin, University of Applied Sciences, Berlin, Germany | |
| CLADAG 2023 | <i>September 2023</i> |
| 14th Scientific Meeting of the CLAssification and Data Analysis Group of SIS University of Salerno, Salerno, Italy | |
| CMStatistics 2022 | <i>December 2022</i> |
| 15th International Conference of the ERCIM WG on Computational and Methodological Statistics King's College London, London, United Kingdom | |
| ECDA 2022 | <i>September 2022</i> |
| European Conference on Data Analysis University of Naples, Naples, Italy | |
| Colloquia Department Methodology and Statistics | <i>December 2021</i> |
| Tilburg University, Tilburg, The Netherlands | |

CONTRIBUTED PRESENTATIONS

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|---|---------------------|
| SIS 2023 | <i>June 2023</i> |
| 52nd Scientific Meeting of the Italian Statistical Society Marche Politecnica University, Ancona, Italy | |
| CESS 2022 | <i>October 2022</i> |
| Conference of the European Statistics Stakeholders Sapienza University of Rome, Rome, Italy | |
| IFCS 2022 | <i>July 2022</i> |
| 17th Conference of the International Federation of Classification Societies University of Porto, Porto, Portugal | |
| SIS 2022 | <i>June 2022</i> |
| 51st Scientific Meeting of the Italian Statistical Society University of Campania Luigi Vanvitelli, Caserta, Italy | |
| IES 2022 | <i>January 2022</i> |
| Innovation & Society 5.0: Statistical and Economic Methodologies for Quality Assessment University of Campania Luigi Vanvitelli, Capua, Italy | |
| 8th Annual Workshop of the Ph.D. School in Statistical Sciences | <i>July 2021</i> |
| University of Rome La Sapienza, Rome, Italy | |
| DSSV-ECDA 2021 | <i>July 2021</i> |
| Data Science, Statistics & Visualisation and the European Conference on Data Analysis Erasmus University Rotterdam, Rotterdam, The Netherlands (Virtual) | |

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| SIS 2021 50th Scientific Meeting of the Italian Statistical Society University of Pisa, Pisa, Italy (Virtual) | <i>June 2021</i> |
| 7th Annual Workshop of the Ph.D. School in Statistical Sciences University of Rome La Sapienza, Rome, Italy | <i>February 2020</i> |
| IFCS 2019 16th Conference of the International Federation of Classification Societies Thessaloniki, Greece | <i>August 2019</i> |
| IES 2019 Statistical evaluation systems at 360°: techniques, technologies and new frontiers European University of Rome, Rome, Italy | <i>July 2019</i> |
| 6th Annual Workshop of the Ph.D. School in Statistical Sciences University of Rome La Sapienza, Rome, Italy | <i>June 2019</i> |
| ECDA 2019 European Conference on Data Analysis University of Bayreuth, Bayreuth, Germany | <i>March 2019</i> |
| Statistics Beyond 2020: challenges and risks European Statistics Day 2017, ESAC Lisbon, Portugal Panel Member as European Master in Official Statistics (EMOS) Student | <i>October 2017</i> |

TEACHING

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|---|--|
| Lecturer Department of Economics, Management and Statistics, University of Milano-Bicocca, Milan, Italy Statistical Modelling II - Part II (PhD course, English, a.a. 2022/2023) | <i>September 2023 – September 2023</i> |
| Adjunct Lecturer Department of Physics, University of Milano-Bicocca, Milan, Italy Advanced Foundations of Statistics for AI (Master, English, a.a. 2022/2023 and 2023/2024) | <i>October 2022 – Present</i> |
| Student Tutor Department of Physics, University of Milano-Bicocca, Milan, Italy Advanced Foundations of Statistics for AI (Master, English, a.a. 2022/2023) | <i>October 2022 – September 2023</i> |
| Lecturer Istituto Nazionale per l'Analisi delle Politiche Pubbliche (INAPP), Rome, Italy Principal Component Analysis with R (Public Administration Training Course, Italian) | <i>March 2022 – March 2022</i> |
| Adjunct Lecturer Department of Law and Economics, University of Rome Unitelma Sapienza, Rome Italy Regression Models (II Level Master Course, Italian, a.a. 2021/2022 and 2022/2023) Course, exams and thesis supervision | <i>June 2022 – Present</i> |
| Adjunct Lecturer Department of Law and Economics, University of Rome Unitelma Sapienza, Rome Italy Statistical Models for Social and Economic Analyses (II Level Master Course, Italian, a.a. 2021/2022) | <i>February 2022 – October 2022</i> |
| Teaching Assistant Department of Economics and Finance, LUISS Guido Carli, Rome Italy Statistics, Prof. Marco Perone Pacifico (Bachelor, English, a.a. 2021/2022) | <i>February 2022 – September 2022</i> |
| Adjunct Lecturer Department of Law and Economics, University of Rome Unitelma Sapienza, Rome Italy Basic Statistics and Mathematics (Master, English, a.a. 2021/2022) | <i>November 2021 – September 2022</i> |
| Teaching Assistant Department of Medicine and Pharmacy, University of Rome La Sapienza, Rome Italy Medical Statistics, Prof. Maurizio Vichi (Master, Italian, a.a. 2020/2021 and 2021/2022) | <i>March 2021 – July 2022</i> |

Student Tutor*January 2021 – Present*

Department of Law and Economics, University of Rome Unitelma Sapienza, Rome Italy
Statistics and Mathematics (Bachelor and Master, Italian and English, a.a. 2020/2021, 2021/2022 and 2022/2023)

Subject Expert*October 2020 – October 2022*

Department of Law and Economics, University of Rome Unitelma Sapienza, Rome Italy
Statistics and Mathematics (a.a. 2020/2021 and 2021/2022)

Teaching Assistant*March 2020 – September 2020*

Department of Political Sciences, University of Roma Tre, Rome Italy
Statistics, Dr. Domenico Cucina (Bachelor, Italian, a.a. 2019/2020)

Teaching Assistant*September 2019 – June 2022*

Department of Statistical Sciences, University of Rome La Sapienza, Rome Italy
Advances in Data Analysis and Statistical Modelling, Prof. Maurizio Vichi (Master, English, a.a. 2019/2020, 2020/2021 and 2021/2022)

Teaching Assistant*September 2019 – June 2022*

Department of Statistical Sciences, University of Rome La Sapienza, Rome Italy
Multivariate Statistics, Prof. Maurizio Vichi (Bachelor, Italian, a.a. 2019/2020, 2020/2021 and 2021/2022)

Teaching Assistant*September 2019 – December 2019*

Department of Statistical Sciences, University of Rome La Sapienza, Rome Italy
Statistics, Prof. Maria Brigida Ferraro, Prof. Stefania Gubbiotti, Prof. Valeria Sambucini (Bachelor, Italian, a.a. 2019/2020)

Teaching Assistant*March 2019 – July 2022*

Department of Medicine and Pharmacy, University of Rome La Sapienza, Rome Italy
Statistics for Research and Technology, Prof. Maurizio Vichi (Master, Italian, a.a. 2018/2019, 2019/2020, 2020/2021, 2021/2022)

Teaching Assistant*February 2019 – September 2019*

Department of Statistical Sciences, University of Rome La Sapienza, Rome Italy
Statistical Inference, Prof. Fulvio De Santis (Bachelor, Italian, a.a. 2018/2019)

ACADEMIC SERVICES

Member of the scientific program committee of SIS 2024

53rd Scientific Meeting of the Italian Statistical Society
June 17-20, 2024, Bari, Italy

Organizer and member of the scientific program committee of StaTalk2023@DSS Sapienza as member of y-SIS

Workshop organized by the young group of the Italian Statistical Society ([link](#))
September 15, 2023, Rome, Italy

Elected member of the board of y-SIS (2023-2025)

Young group of the Italian Statistical Society ([link](#))

Editor of the Springer volume "High-quality and Timely Statistics - New Methods and Applications"

Springer book series of the CESS 2022 conference ([link](#))

Referee

Advances in Data Analysis and Classification, Annals of Operations Research, Australian & New Zealand Journal of Statistics, Computational Statistics, Journal of Classification, Metron, Proceedings of the Royal Society A, Soft Computing, SN Business & Economics (SNBE), Statistica Applicata, Book of Short Papers SIS 2022.

Organizer and chair of the y-SIS Invited Session "y-SIS - Advances in Robust Statistical Methods for Complex Data" of CMStatistics 2023

16th International Conference of the ERCIM WG on Computational and Methodological Statistics ([link](#))

December 16-18, 2023, Berlin, Germany

Chair of the Invited Session "Advances in Dimensionality Reduction" of CMStatistics 2022

15th International Conference of the ERCIM WG on Computational and Methodological Statistics ([link](#))

December 17-19, 2022, London, United Kingdom

Member of the Local Organizing Committee of CESS 2022

Conference of European Statistics Stakeholders 2022 ([link](#))

October 20-21, 2022, Rome, Italy

Chair of the y-SIS Invited Session "Advances in Dimensionality Reduction" of ECDA 2022

European Conference on Data Analysis ([link](#))

September 14-16, 2022, Naples, Italy

Organizer and chair of the y-SIS Solicited Session "Advances in Clustering" of SIS 2022

51st Scientific Meeting of the Italian Statistical Society ([link](#))

June 22-24, 2022, Caserta, Italy

Organizer of the 8th Annual Workshop of the Ph.D. School in Statistical Sciences

June 15-16, 2021, University of Rome La Sapienza, Rome, Italy

SOCIETY MEMBERSHIPS

SIS, y-SIS and CLADAG-SIS Member

July 2019 – Present

Member of the Italian Statistical Society (Società Italiana di Statistica, SIS), Young SIS and CLAssification and Data Analysis Group (CLADAG)

IAOS Member

January 2018 – December 2018

Member of the International Statistical Society

LANGUAGES

Italian Mother tongue

English Fluent

French Good

COMPUTER SKILLS

Languages MATLAB, R, R Studio, SAS, SAS Enterprise Miner 14, SPSS, LaTeX

Software Microsoft Office

Certifications SAS Predictive Modeler Using SAS Enterprise Miner 14 (October 8, 2018)

OTHER EXPERIENCES

IELTS Invigilator

December 2015 – March 2019

British Council

Rome, Italy

INCREASE Delegate

June 2012

XII International Human Right Council, OLMUN

Oldenburg, Germany

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000.

Milan, October 18th, 2023