

# GIORGIA ZACCARIA

## PERSONAL DATA

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

**Nationality** Italian

✉ [giorgia.zaccaria@unimib.it](mailto:giorgia.zaccaria@unimib.it) ◇ [giorgia.zaccaria@unitelmasapienza.it](mailto:giorgia.zaccaria@unitelmasapienza.it)

🌐 [Personal Page](#) ◇ [Institutional Page](#) ◇ [Google Scholar](#) ◇ [Research Gate](#) ◇ [ORCID](#)

◇ [Sapienza University of Rome](#) ◇ [LinkedIn](#)

## EMPLOYMENT

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### 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

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### 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

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### Tilburg University, Tilburg, The Netherlands

*November 2021 – January 2022*

Department of Methodology and Statistics

Supervisor: Prof. Jeroen K. Vermunt

## RESEARCH INTERESTS

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Ultrametric Models

Dimensionality Reduction

Model-Based Clustering

Hierarchical Models

Robust statistics

Latent Variable Models

## AWARDS, GRANTS & SCHOLARSHIP

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**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

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### 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

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### INVITED PRESENTATIONS

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

### CONTRIBUTED PRESENTATIONS

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

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

## TEACHING

<b>Lecturer</b> 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>
<b>Adjunct Lecturer</b> 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>
<b>Student Tutor</b> 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>
<b>Lecturer</b> 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>
<b>Adjunct Lecturer</b> 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>
<b>Adjunct Lecturer</b> 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>
<b>Teaching Assistant</b> 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>
<b>Adjunct Lecturer</b> 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>
<b>Teaching Assistant</b> 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)

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**ACADEMIC SERVICES**

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**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, Statistics and Probability Letters, 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

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**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

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**Italian** Mother tongue

**English** Fluent

**French** Good

## COMPUTER SKILLS

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**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

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**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