

# Curriculum Vitae of Marco Berrettini

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## CURRENT POSITION

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### Junior assistant professor (fixed-term)

March 2023 – Present

*Department of Statistical Sciences, University of Bologna*

- Project: “Statistical foundations of AI: advanced methods and stochastic models for learning and prediction of complex and high-dimensional data”
- Supervisor: Prof. Cinzia Viroli

## PAST POSITION

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### Research fellow

Jan 2021 – Feb 2023

*Department of Statistical Sciences, University of Bologna*

- Project: “Dynamic and epidemiological models for predicting and controlling the parasite outbreaks in Mediterranean farms”
- Supervisor: Prof. Cinzia Viroli

## EDUCATION

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### PhD in Statistical Sciences

Nov 2017 – May 2021

*University of Bologna*

- Thesis: “Flexible Bayesian modelling of concomitant covariate effects in mixture models”
- Advisor: Prof. Giuliano Galimberti

### Master’s Degree in Statistical Sciences

Sep 2015 – Jul 2017

*University of Bologna*

- Curriculum: Statistical - Methodological
- Thesis: “Flexible modelling of concomitant covariate effects in latent class analysis: some solutions based on spline functions”
- Advisor: Prof. Giuliano Galimberti
- Co-Advisor: Prof. Brendan Murphy
- Final grade: 110/110 cum laude

### Bachelor of Science in Statistical Sciences

Sep 2012 – Jul 2015

*University of Bologna*

- Curriculum: Bio - Demographic
- Thesis: “Modelli di regressione per la valutazione di eventi demografici estremi in dati di sequenziamento su popolazioni umane”
- Advisor: Prof. Rossella Miglio
- Co-Advisors: Dr. Alessio Boattini and Dr. Luca Pagani
- Final grade: 110/110 cum laude

## ATTENDANCE AT SUMMER SCHOOLS

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### III International School on Classification and Data Analysis

May 2 – 6, 2022

*Lake Como School of Advanced Studies*

- Title: “Robust Statistics: Foundations and Recent Developments”
- Organiser: Prof. Francesca Greselin

## RESEARCH ABROAD EXPERIENCE

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### Visiting PhD student

Oct 2019 – Dec 2019

*School of Mathematics and Statistics, University College Dublin*

- Project: “Mixtures of experts with flexible concomitant covariate effects: a Bayesian solution”
- External Supervisor: Prof. Thomas Brendan Murphy

### Visiting student

May 2017 – June 2017

*School of Mathematics and Statistics, University College Dublin*

- Project: “Flexible modelling of concomitant covariate effects in latent class analysis: some solutions based on spline functions”
- External Supervisor: Prof. Thomas Brendan Murphy

**Published papers in statistics journals:**

- Berrettini, M., Galimberti, G. (2025). *Exact score vector and Hessian matrix for mixtures of matrix-variate normals*. Statistical Analysis and Data Mining, 18(3), e70030. DOI: 10.1002/sam.70030.
- Berrettini, M., Galimberti, G., Viroli, C. (2025). *Mean-restricted Matrix-variate Normals with an application to clustering*. Statistics and Computing, 35(100). DOI: 10.1007/s11222-025-10641-7.
- Berrettini, M., Hennig, C. M., Viroli, C. (2025). *The quantile-based classifier with variable-wise parameters*. The Canadian Journal of Statistics, 53(2), e11837. DOI: 10.1002/cjs.11837.
- Berrettini, M., Galimberti, G., Ranciati, S. Murphy, T. B. (2024). *Identifying Brexit voting patterns in the British House of Commons: an analysis based on Bayesian mixture models with flexible concomitant covariate effects*. Journal of the Royal Statistical Society: Series C, 73, 621-638. DOI: 10.1093/jrsssc/qlae004.
- Berrettini, M., Galimberti, G., Ranciati, S. (2023). *Semiparametric finite mixture of regression models with Bayesian P-splines*. Advances in Data Analysis and Classification, 17, 745-775. DOI: 10.1007/s11634-022-00523-5.

**Book chapters accepted for publication:**

- Berrettini, M., Galimberti, G., Murphy, T. B., Ranciati, S. (2025). *Modelling football players field position via mixture of Gaussians with flexible weights*. In “Statistical Models and Learning Methods for Complex Data”, to appear.

**Published papers in other fields:**

- Busti, S., Mammi, L. M. E., Bonaldo, A., Ciulli, S., Volpe, E., Errani, F., Brambilla, F., Ekmay, R., Scicchitano, D., Candela, M., Foresto, L., Zampiga, M., Berrettini, M., Dondi, F., Gatta, P. P., Parma, L., Benini, E. (2025). *First insight into the practical dietary application of Torula yeast single cell protein in gilthead sea bream*. Aquaculture, 630, 742410. DOI: 10.1016/j.aquaculture.2025.742410.
- Bulletti, F. M., Sciorio, R., Conforti, A., De Luca, R., Bulletti, C., Palagiano, A., Berrettini, M., Scaravelli, G., Pierson, R. (2025). *Causes of embryo implantation failure: A systematic review and metaanalysis of procedures to increase embryo implantation potential*. Frontiers in Endocrinology, 15, 1-17. DOI: 10.3389/fendo.2024.1429193.
- Bulletti, C., Franasiak, J. M., Busnelli, A., Sciorio, R., Berrettini, M., Aghajanova, L., Bulletti, F. M., Ata, B. (2024). *Artificial Intelligence, Clinical Decision Support Algorithms, Mathematical Models, Calculators Applications in Infertility: Systematic Review and Hands-On Digital Applications*. Mayo Clinic Proceedings: Digital Health, 2(4), 518-532. DOI: 10.1016/j.mcpdig.2024.08.007.
- Bulletti, F. M., Sciorio, R., Palagiano, A., Guido, M., Berrettini, M., Bulletti, C. (2023). *Telemedicine in IVF Programs*. Biomedical Journal of Scientific & Technical Research, 51(2), 42611 - 42618. DOI: 10.26717/BJSTR.2023.51.008088.
- Bulletti, F. M., Berrettini, M., Sciorio, R., Bulletti, C. (2023). *Artificial intelligence algorithms for optimizing assisted reproductive technology programs: A systematic review*. Global Translational Medicine, 2(2), 1-12. DOI: 10.36922/gtm.0308.

**Short papers:**

- Berrettini, M., Galimberti, G., Murphy, T. B., Ranciati, S. (2023). *Modelling soccer players field position via mixture of Gaussians with flexible weights*. In: C. Rampichini, M. La Rocca, P. Coretto, G. Giordano, M. L. Parrella (Eds.), CLADAG 2023 Book of Abstracts and Short Papers, pp. 351-354. Pearson (ISBN 978-88-9193-563-2).
- Berrettini, M., Galimberti, G., Ranciati, S. (2021). *Semiparametric finite mixture of regression models with Bayesian P-splines*. In: G. C. Porzio, C. Rampichini, C. Bocci (Eds.): CLADAG 2021 Book of Abstracts and Short Papers, pp. 268 - 271. Firenze University Press (ISBN 978-88-5518-340-6).
- Berrettini, M., Galimberti, G., Murphy, T. B., Ranciati, S. (2019). *Mixtures of experts with flexible concomitant covariate effects: a Bayesian solution*. In: G. C. Porzio, F. Greselin, S. Balzano (Eds.), CLADAG 2019 Book of Short Papers, pp. 87 - 90. Centro Editoriale di Ateneo, Università di Cassino e del Lazio Meridionale (ISBN 978-88-8317-108-6).

**Abstracts:**

- Berrettini, M., Galimberti, G., Ranciati, S., Murphy, T. B. (2019). *Flexible Bayesian modelling of concomitant covariate effects in mixture models*. In: CFE-CMStatistics 2019 Book of Abstracts, p. 23. EcoSta (ISBN 978-9963-2227-8-0).

**Other:**

- Berrettini, M. (2021). *Flexible Bayesian modelling of concomitant covariate effects in mixture models*. Dissertation thesis, supervisor: Prof. Giuliano Galimberti. Alma Mater Studiorum University of Bologna, PhD in Statistical Sciences, 33rd Cicle. DOI: 10.48676/unibo/amsdottorato/9861.

### R packages:

- Berrettini, M., Hennig, C. M., Viroli, C. (2024). *quantileDA: Quantile Classifier*. R package version 1.2. DOI: 10.32614/CRAN.package.quantileDA.

### Github Repositories ([github.com/MarcoBerrettini/](https://github.com/MarcoBerrettini/)):

- hessianMMVN
- RestrictedMMVN
- Brexit
- sMoE

## PEER REVIEW ACTIVITY

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### Reviewer for:

- Statistical Analysis and Data Mining (Wiley, ISSN 1932-1872)
- Journal of Classification (Springer Nature, ISSN 1432-1343)
- Scientific Reports (Springer Nature, ISSN 2045-2322)
- The Journal of Supercomputing (Springer Nature, ISSN 1573-0484)
- Journal of Ovarian Research (Springer Nature, ISSN 1757-2215)

## CONFERENCES, WORKSHOPS & TALKS

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### Invited sessions

#### as speaker:

- “*Mixture of matrix-variate normals with mean restrictions*” (with G. Galimberti and C. Viroli). 19th International Joint Conference on Computational and Financial Econometrics (CFE) and Computational and Methodological Statistics (CMStatistics) – London (UK), December 13 - 15, 2025 (forthcoming session “CO239: Model-based clustering: Theory and applications”).
- “*Semiparametric finite mixture of regression models with Bayesian P-splines*” (with G. Galimberti and S. Ranciati). CSDA & EcoSta Workshop on Statistical Data Science (SDS 2022) – Bologna (IT), August 26 - 28, 2022.

#### as co-author:

- “*Flexible Bayesian modelling of concomitant covariate effects in mixture models*” (with G. Galimberti, S. Ranciati, T. B. Murphy). 12th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019) – London (UK), December 14 - 16, 2019.

### Contributed sessions

#### as speaker:

- “*Closed-form information matrix expressions for matrix-normal mixtures*” (with G. Galimberti). Classification and Data Analysis Working Group of the Italian Statistical Society, 15th meeting (CLADAG 2025) – Napoli (IT), September 8 - 10, 2025.
- “*Mean-restricted Matrix-variate Normals with an application to clustering*” (with G. Galimberti and C. Viroli). European Conference on Data Analysis (ECDA 2024) – Gdansk (PL), September 9 - 11, 2024.
- “*Modelling soccer players field position via mixture of Gaussians with flexible weights*” (with G. Galimberti, T. B. Murphy and S. Ranciati). Classification and Data Analysis Working Group of the Italian Statistical Society, 14th meeting (CLADAG 2023) – Salerno (IT), September 11 - 13, 2023.
- “*Modelling the Sparicotype chrysophrii outbreaks in gilthead seabream (*Sparus aurata*) Mediterranean aquaculture*” (with R. Barić, S. Čolak, M. Kolega, D. Mejđandžić, M.L. Fioravanti, A. Gustinelli, L. Parma and C. Viroli). Aquaculture Europe 2021 – Funchal, Madeira (PT), October 4 - 7, 2021.
- “*Semiparametric finite mixture of regression models with Bayesian P-splines*” (with G. Galimberti and S. Ranciati). Classification and Data Analysis Working Group of the Italian Statistical Society, 13th meeting (CLADAG 2021) – Firenze (IT), September 9 - 11, 2021.
- “*Mixtures of experts with flexible concomitant covariate effects: a Bayesian solution*” (with G. Galimberti, T. B. Murphy and S. Ranciati). Classification and Data Analysis Working Group of the Italian Statistical Society, 12th meeting (CLADAG 2019) – Cassino (IT), September 11 - 13, 2019.

## Posters - Lightning talks

as speaker:

- “Mean-restricted Matrix-variate Normals with applications to clustering” (with G. Galimberti and C. Viroli). Working Group on Model-Based Clustering, 30th meeting (WGMBC) – Bertinoro (IT), July 22 - 27, 2024.
- “Bayesian semiparametric finite mixture of regression models” (with G. Galimberti and S. Ranciati). Workshop on Models and Learning in Clustering and Classification, 6th meeting (MBC<sup>2</sup>) – Catania (IT), August 31 - September 2, 2022.

as co-author:

- “Pro health feed to mitigate Sparicotylosis effects in caged gilthead seabream (*Sparus aurata*): preliminary results” (with A. Musmanno, S. Čolak, M. Kolega, M.L. Fioravanti, C. Viroli, D. Mejdandžić, R. Barić, G. Bignami, A. Di Biase, A. Gustinelli). Aquaculture Europe 2022 – Rimini (IT), September 27 - 30, 2022.

## AWARDS

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### Best poster award

2022

- for “Bayesian semiparametric finite mixture of regression models”(with G. Galimberti and S. Ranciati) – 6th Workshop on Models and Learning in Clustering and Classification (MBC<sup>2</sup>).

## SCHOLARSHIPS

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### Marco Polo Fellowship

2019

- Fellowship for research periods (3 months) abroad aimed at the preparation of the doctoral dissertation.

## PARTICIPATION IN RESEARCH PROJECTS

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### FAIR

Mar 2023 – Present

as member of the research team:

- *Future Artificial Intelligence Research - Spoke 8 (Pervasive AI)*, funded by the European Commission under the NextGeneration EU programme, PNRR - M4C2 - Investimento 1.3, Partenariato Esteso PE00000013 (fondazione-fair.it).

### NewTechAqua

Jan 2021 – Feb 2023

as member of the research team:

- *New Technologies Tools and Strategies for a Sustainable, Resilient and Innovative European Aquaculture*, funded from the European Union’s Horizon 2020 Programme under grant agreement No 862658 (newtechaqua.eu).

## INSTITUTIONAL AND PROFESSIONAL SERVICE

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### Department of Statistical Sciences, University of Bologna

June 2025 – Present

- member of Statistics Clinic, internal statistical consulting and support service offered within the University of Bologna (site.unibo.it/statistics-clinic).
- member of the Social Media and Communication Team.

### Una Europa

September 2022 – Present

- member of the working group for the design of a second cycle degree program in Applied Data Science.
- member of the team for the design and delivery of the lifelong learning certificate in Data Science.

### Congredior

October 2023

- consultant for scientific articles and planning of the workshops “Brainstorming on Human Reproduction” and “Brainstorming on Reproductive Technologies”.

## COMMETTEES

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### Internal examiner for final dissertations

as secretary:

- Second Cycle Degree Programme in Statistics, Economics and Business, University of Bologna (March 26, 2024).

as member:

- First Cycle Degree Programme in Economics, Politics and Social Sciences, University of Bologna (September 11, 2025).
- Second Cycle Degree Programme in Statistical Sciences, University of Bologna (March 21, 2024).

### 2023 – 2026

*as Assistant Professor:*

- *Programming Lab 2* – 2 CFU (20 hours), first cycle degree programme (L) Economics, Politics and Social Sciences, University of Bologna.
- *Statistica per l'Analisi dei Big Data* – 8 CFU (40 hours), Second cycle degree programme (LM) in Governance e Politiche dell'Innovazione Digitale, University of Bologna.

### 2022 – 2023

*as Assistant Professor:*

- *Data Science Applications* – 6 CFU (30 hours), second cycle degree programme (LM) in Statistical Sciences, University of Bologna.
- *Laboratorio di Analisi dei Dati (A-L)* – 4 CFU (30 hours), first cycle degree programme (L) in Scienze Statistiche, University of Bologna.

*as Adjunct Professor:*

- *Statistical Software for Business* – 6 CFU (30 hours), second cycle degree programme (LM) in Statistics, Economics and Business, University of Bologna.

*as Teaching Tutor:*

- *From Data to Decision*, lifelong learning certificate in Data Science, Fondazione Alma Mater.
- *Statistical Models* (10 hours), first cycle degree programme (L) in Statistical Sciences, University of Bologna.

### 2021 – 2022

*as Adjunct Professor:*

- *Statistical Software for Business* – 6 CFU (30 hours), second cycle degree programme (LM) in Statistics, Economics and Business, University of Bologna.

*as Teaching Tutor:*

- *Supervised Statistical Learning* (10 hours), second cycle degree programme (LM) in Statistical Sciences, University of Bologna.
- *Statistics and Programming* (40 hours), first cycle degree programme (L) in Economics, Politics and Social Sciences, University of Bologna.
- *Statistical Models and Applications* (15 hours), second cycle degree programme (LM) in Statistical Sciences, University of Bologna.
- *Statistical Models* (10 hours), first cycle degree programme (L) in Statistical Sciences, University of Bologna.

### 2020 – 2021

*as Teaching Tutor:*

- *Statistical Models and Applications* (15 hours), second cycle degree programme (LM) in Statistical Sciences, University of Bologna.
- *Statistical Models* (10 hours), first cycle degree programme (L) in Statistical Sciences, University of Bologna.

### 2019 – 2020

*as Teaching Tutor:*

- *Statistical Models and Applications* (15 hours), second cycle degree programme (LM) in Statistical Sciences, University of Bologna.
- *Tutorials in Statistics* (42 hours), second cycle degree programme (LM) in Economics, University of Bologna.

### 2018 – 2019

*as Teaching Tutor:*

- *Statistica A-E* (25 hours), first cycle degree programme (L) in Scienze Politiche, Sociali e Internazionali, University of Bologna.
- *Statistics LM* (30 hours), second cycle degree programme (LM) in Economics, University of Bologna.

### Master's Theses

*as Advisor:*

- Furlanis, E. (2024): *Geospatial optimization and profiling of outlets through partitional clustering methods* – second cycle degree programme (LM) in Statistics, Economics and Business, University of Bologna.

*as Co-advisor:*

- Bocchio, L. (2024): *Flexible latent class models with concomitant variables based on B-splines: a comparison among estimation methods* – second cycle degree programme (LM) in Statistical Sciences, University of Bologna.

### Bachelor's Theses

*as Advisor:*

- Sita, A. (2025 - in progress): *Modelli lineari generalizzati per la valutazione dell'impatto difensivo di un giocatore di pallacanestro sulla mappa di tiro avversaria (working title)* – first cycle degree programme (L) in Scienze Statistiche, University of Bologna.