

# Elena Geminiani

## Postdoctoral Researcher in Statistics, University of Bologna

📍 Bologna, Italy

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**Profile summary:** Strong background in statistics, data analysis and machine learning, enriched by research periods abroad at renowned worldwide universities. Enthusiastic about anything at the intersection between statistics and computational science. Teaching assistant in three university courses. Looking for a challenging and dynamic environment where I can apply and extend my skills to make an impact on real-world problems.

### Interests

Data Analysis  
Machine Learning  
Multivariate Analysis  
Data Science  
Text Analysis  
Sparsity  
Data Visualization  
Optimization  
Dimension Reduction  
Latent variables  
Classification  
Clustering  
Neural Networks  
Programming

### Talks

Statistics Seminar at LSE (2019)  
International Meeting of Psychometric Society, New York (2018)  
ACTNext Tech Talk, Iowa City (2018)

### Conferences

IMPS 2018  
eRun 2020  
useR 2020  
R-ladies meetings  
WiDS meetings

### Languages

Italian (mother tongue)  
English (C2 level)  
French (B1 level)  
German (B1 level)

## Work Experience

### Postdoctoral Researcher

Development of advanced parsimonious latent variable models for the analysis of graduates' satisfaction.

University of Bologna

Oct 2019 – present

### Teaching Assistant

Tutor for three undergraduate and postgraduate courses. Tasks include giving lectures, lab and class practicals, exam invigilation and office hour.

University of Bologna

Sep 2014 – present

## Education

### PhD in Statistics

Thesis: *A penalized likelihood-based framework for single and multiple-group factor analysis models.*

University of Bologna

Oct 2016 – Sep 2019

### Master's degree in Statistical Sciences

110/110 cum laude  
Thesis: *Wald tests for factor loading differences in mixture simultaneous factor analysis: power and specificity.*

University of Bologna

Sep 2014 – Jul 2016

### Bachelor in Statistical Sciences (Double Degree)

110/110 cum laude; Honours of the First Class  
Thesis: *A comparison of clustering methods for determining the operational states of a wastewater treatment plant.*

Universities of  
Bologna & Glasgow

Sep 2011 – Jul 2014

## International Experiences

### University College London (UCL)

Department of Statistical Science  
Visitor research student; preparation of the doctoral dissertation.

London, UK

Nov 2018 – Jun 2019

### London School of Economics (LSE)

Department of Statistics  
Erasmus+ PhD student; preparation of the doctoral dissertation.

London, UK

Jan 2018 – Jun 2018

### Katholieke Universiteit Leuven

Faculty of Psychology and Educational Sciences  
Visiting Scholar; preparation of the Master's thesis project.

Leuven, Belgium

Feb 2016 – May 2016

### University of Glasgow

Department of Mathematics  
Fourth-year attendance of the Bachelor in Statistical Sciences, preparation of the Bachelor project and graduation.

Glasgow, UK

Sep 2013 – May 2014

## Skills

### Programming

R & tidyverse (9 years)  
Python (< 1 year)  
SPSS (< 1 year)  
SAS (1 year)  
SAS Enterprise Miner  
(1 year)

### Databases

SQL (< 1 year)  
MongoDB (< 1 year)

### Big Data

Spark (< 1 year)  
KNIME (< 1 year)  
Hadoop (< 1 year)

### Reporting

R Markdown (4 years)  
LaTeX (6 years)  
MS Office (10 years)

### Visualization

R (9 years)  
Tableau (< 1 year)

### Version Control

Git & Github (1 year)

### Websites & Apps

R Shiny (2 years)  
blogdown (< 1 year)  
Hugo (< 1 year)

### Transferable

Problem Solving  
Independence  
Fast learning  
Commitment  
Time Management  
Public Speaking  
Technical Writing

## Projects

- 📌 My contributions to the #tidytuesday challenges ([link to projects](#))  
Sample projects: Text Mining the Simpsons Show ([link](#)); BBC Music Best Hip Hop Songs ([link](#))  
data wrangling, data visualization, data analysis, text mining, web scraping, Spotify API
- 📁 Personal website: [elena.rbind.io](#)  
R, blogdown, Hugo, Github, Markdown
- 🔧 Fault prediction of a wastewater treatment plant  
clustering, predictive maintenance, dimension reduction, time series, anomaly detection
- 📊 Sparse estimation of factor analysis models  
shrinkage, optimization, efficiency, penalty functions, dimension reduction
- 📖 Text analysis of Shakespeare's works ([link](#))  
non-negative matrix factorization, topic modelling, document classification, text mining
- ⚙️ Shiny app for sparse factor analysis  
R, interactive data visualization, dashboard, factor analysis, multivariate analysis
- 🌐 Exploration of cross-cultural differences in emotions  
factor analysis, hypothesis testing, multiple groups, mixture clustering
- 🖌️ Image processing of Raphael's Artwork ([link](#))  
image compression, matrix decomposition, non-negative matrix factorization
- 🏛️ Analysis of MoMA artwork collection  
pre-processing, data cleaning, analysis, modelling, reporting
- 📋 Assessment of students' psychological abilities  
regularization, factor analysis, sparsity, dimension reduction, multiple groups
- 📈 Development of University capacities in Albania  
pre-processing, data cleaning, multivariate analysis, educational testing
- 🏔️ Projects on Kaggle: see personal [notebooks](#)  
data wrangling, pre-processing, model building, analytics, data visualization

## Achievements & Certifications

- Contributor of R package **GJRM**
- Certifications obtained through Coursera (2020)
  - SQL for Data Science (UC Davis)
  - Fundamentals of Visualization via Tableau (UC Davis)
  - Essential Design Principles for Tableau (UC Davis)
  - Introduction to Big Data (UC San Diego)
  - Big Data Modeling and Management Systems (UC San Diego)
  - Big Data Integration and Processing (UC San Diego)
  - Machine Learning with Big Data (UC San Diego)
- SAS Certified Predictive Modeler using SAS Enterprise Miner 13 (2015)
- SAS Certified Base Programmer for SAS 9 (2015)

## Publications

- **Geminiani, E.** (2020). *A penalized likelihood-based framework for single and multiple-group factor analysis models* (Doctoral dissertation, University of Bologna). Available at [amsdottorato.unibo.it/id/eprint/9355](https://amsdottorato.unibo.it/id/eprint/9355)
- **Geminiani, E., Ceulemans, E. & De Roover, K.** (In press). *Testing for factor loading differences in mixture simultaneous factor analysis: A Monte Carlo simulation-based perspective*, Structural Equation Modeling: A Multidisciplinary Journal.
- **Geminiani, E., Marra, G. & Moustaki, I.** (Under review) *A penalized likelihood-based framework for single and multiple-group factor analysis models*. Psychometrika.

## Awards & Scholarships

- **Research fellowship** at the University of Bologna funded by *GRADUA* (GRaduates Advancement and Development of University capacities in Albania; 2019).
- **Marco Polo** scholarship for periods abroad (UCL, London; 2018).
- **ACTNext Travel Award** to support travel to the IMPS conference (2018).
- **Erasmus+** scholarship for research periods abroad (LSE, London; 2017).
- **PhD scholarship** at the University of Bologna (2016).
- **Study award** in favor of worthy students of the University of Bologna (2016).
- **Master's thesis** scholarship for research periods abroad (KU Leuven; 2015).
- **Erasmus** scholarship for research periods abroad (University of Glasgow; 2013).
- **Study Award**: two-times recipient of the scholarship by **CO.RA S.p.A.** (car accessories distributions), Barbiano di Cotignola (2011, 2012).