

Angela Andreella

ASSITANT PROFESSOR OF SOCIAL STATISTICS · RTD-A

Department of Economics, Ca' Foscari University of Venice

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Current Position

2021-now **Assistant Professor of Social Statistics, [RTD-A] SSD: SECS-S/05 (Social Statistics)**, Department of Economics, Ca' Foscari University of Venice, Italy.

Past experiences

- 2021-2021 **Post-doctoral fellow**, Project: A Bayesian Approach to the Procrustes-based problem. Grant: BIRD2020 (38734 euros). Department of Statistical Sciences, University of Padova, Padova, Italy.
(8 months)
- 2020-2021 **Post-doctoral fellow**, Project: Tsunami Project - Prediction of the Impact of the COVID-19 Wave on the Emergency and Urgency System in Lombardy. Grant: UA.00.07 – DISAT budget 2020 (16000 euros). Department of Sciences and Technology, University of Insubria, Varese, Italia.
(6 months)
- 2014-2015 **Stage**, Project: The Catalan National Movement analyzed by Twitter data. Universitat Politècnica de Catalunya, Barcelona, Spagna.
(1 year)
- 2015-2015 **Stage**, Project: Text-mining in marine biology. Stazione Zoologica Anton Dohrn, Napoli, Italia.
(2 months)

Education

University of Padova

Department of Statistical
Science

PHD IN STATISTICS

10/2017 - 03/2021

- Supervisor: Prof. Livio Finos (University of Padova, Padova, Italia), Co-supervisor: Prof. Jelle Goeman (Leiden University Medical Center, Leiden, The Netherlands), Prof. James Haxby (Dartmouth College, Hanover, NH, USA)
- Thesis title: Challenges in Functional Magnetic Resonance Imaging (fMRI) Data Analysis: From Functional Alignment to Selective Inference.

University of Padova

Department of Statistical
Science

MASTER'S DEGREE IN STATISTICAL SCIENCES

10/2013 - 03/2016

- Supervisor: Prof. Livio Finos (University of Padova, Padova, Italia), Co-supervisor: Prof. Marta Perez (Universitat Politècnica de Catalunya, Barcelona, Spagna)
- Thesis title: The Catalan National Movement analyzed by Twitter data.

University of Padova

Department of Statistical
Science

BACHELOR'S DEGREE IN STATISTICAL SCIENCES

10/2010 - 04/2013

- Supervisor: Prof. Nicola Sartori (University of Padova, Padova, Italia), Co-supervisor: Prof. Livio Finos (University of Padova, Padova, Italia)
- Thesis title: Twitter Sentiment Analysis in Monti's 2013 election campaign.

Liceo Classico Scipione Maffei

Verona, Italy

HIGH SCHOOL DIPLOMA (CLASSICAL STUDIES)

2004-2009

Training and research activities

2020-2020 (1 week)	Short Term Scientific Mission, COST ACTION (1500 euro) , Supervisor: Antonietta Mira, Data Science Lab, Università della Svizzera Italiana, Lugano, Svizzera
2019-2019 (3 months)	Visiting PhD Student , Supervisor: Jelle Goeman, LUMC, Department of Biomedical Data Sciences, Leiden, The Netherlands
2019-2019 (3 months)	Visiting PhD Student , Supervisor: James Haxby, Dartmouth College, Department of Psychological and Brain Sciences, Hanover, NH, USA
2013-2014 (1 year)	Erasmus Student , Universitat de Barcelona, Department of Mathematics and Statistics, Barcelona, Spain

Direction or participation in the activities of a research group characterized by national or international collaborations

Collaborator as a statistical analyst with the Governance & Social Innovation (GSI) Center directed by Prof. Stefano Camprostrini. The Center's mission is to promote social innovation processes in the logic of service management by involving all stakeholders. The collaboration led to the writing of the paper [18] presented at the meeting of social statisticians in Treviso (December 2022) and at CARMA in Seville (June 2023).

Member of the statistician and psychometric group (Psicostat, <https://psicostat.dpss.psy.unipd.it/>) of the Department of Developmental and Socialization Psychology, University of Padova. The collaboration led to the publication of work [6], as well as several symposia at national and international conferences.

Collaborator as a statistician in the research group of Prof. P. Brambilla, particularly Dr. G. Del Vecchio. Collaborations in the field of neuroscience have led to the publication of several applied papers with high methodological content and papers presenting innovative statistical methods. The collaboration is still ongoing and has led to the publication of several papers [5], [7], [8], [9].

Member of the research group on Population Aging and Longevity (LoLa, https://lola.projects.unibz.it/?page_id=367&lang=it).

Member of the Global Burden of disease (GBD, <https://www.healthdata.org/gbd/2019>) Italian research group. The collaboration led to the writing of the paper [19]

Awards, Fellowships, & Grants

2023	Teaching Award , Department of Economics, Ca' Foscari University of Venice	3000 euros
2021, 3 years	Grant PON, Ricerca e Innovazione: "SOcial Innovation DATA Science" , Department of Economics, Ca' Foscari University of Venice	109032.09 euros
2021, 24 months	Grant BIRD2020: "A Bayesian Approach to the Procrustes-based problem" , Department of Statistical Sciences, University of Padova	38734 euros
2021, 6 months	UA.00.07 – DISAT: "Tsunami Project - Prediction of the Impact of the COVID-19 Wave on the Emergency and Urgency System in Lombardy" , Department of Sciences and Technology, University of Insubria	16000 euros
2020	Grant for Short Term Scientific Mission, COST ACTION	1500 euros
2011	Scholarship for merit , University of Padova	2010 euros

Talks

SEMINARS

- 2023. *The Labyrinth of Multiple Testing: how to avoid the pitfall of false positives*. 12th SISMEC National Congress, Jesi, Italy.
- 2023. *Graph Theoretic Foundation of Networks in R*. Summer School in Network Econometrics, VERA, SIdE-IEA, Venezia, Italy.
- 2022. *Moving beyond linearity*. Summer School in Social Statistics, Anacapri, Italy.
- 2022. *Graph Theoretic Foundation of Networks in R*. Summer School in Network Econometrics, VERA, SIdE-IEA, Venezia, Italy.
- 2019. *How to improve the functional alignment of fMRI data using spatial brain information?*. High dimensional reading club, LUMC, Department of Biomedical Data Sciences, Leiden, The Netherlands.

2019. *A Statistical approach to the alignment of fMRI data*. Dartmouth College, Department of Psychological and Brain Sciences, Hanover, NH, USA.

INVITED TALKS

2023. *A novel definition of Italian comorbidity*. PRIN SELECT, Venice.

2023. *A novel definition of Italian comorbidity based on PASSI and GBD disability weights*. GSI, Venice.

2022. *Enhanced hyperalignment via spatial prior information*. Psicostat, Padova.

2020. *A Statistical approach to the alignment of fMRI data*. Psicostat, Padova.

2019. *First steps with Python*. Psicostat, Padova.

INVITED TALKS AS DISCUSSANT

2022. *Notip: Non-parametric True Discovery Proportion control for brain imaging*. International Seminar on Selective Inference.

CONTRIBUTED TALKS

2023. *Toward a power analysis and sample size estimation for PLS-based methods*, International Society for Clinical Biostatistics (ISCB), Milan, Italy.

2023. *Spatial clusters for demand and supply of childcare services in Italy*, 5th International Conference on Advanced Research Methods and Analytics (CARMA), Sevilla. Spain.

2023. *A novel definition of Italian comorbidity based on PASSI and GBD disability weights*, Italian Statistics Society (SIS), Ancona, Italy.

2023. *A novel definition of Italian comorbidity based on PASSI and GBD disability weights*, Espérance de Vie et Santé (REVES), Padova, Italy.

2022. *Spatial clusters for demand and supply of childcare services in Italy*, Meeting social statisticians, Treviso, Italy.

2022. *Functional alignment enhances Electroencephalography (EEG) data's group analysis*, Italian Psychology Association (AIP), Padova, Italy

2022. *Valid double-dipping for fMRI cluster analysis via permutation-based selective inference*, European Mathematical Psychology Group (EMPG), Rovereto, Italy

2022. *Valid inference for group analysis of functionally aligned MRI images*, Italian Statistics Society (SIS), Caserta, Italy.

2021. *Efficient Procrustes-based functional alignment for high-dimensional data*, International Biometric Society - Italian Region, Milan, Italy

2021. *pARI package: valid double-dipping via permutation-based All Resolutions Inference*, useR!, Milan, Italy.

2021. *Functional alignment by the "light" approach of the von Mises-Fisher-Procrustes model*, Italian Statistics Society (SIS), Milan, Italy.

2021. *pARI package: valid double-dipping via permutation-based All Resolutions Inference*, EuroBioc, Padova, Italy.

2020. *Quot capita, tot sententiae. Don't Forget to Use Anatomical Features into the Alignment of fMRI Data*, Cognitive Science Arena, Brixen, Italy.

2020. *A Statistical approach to the alignment of fMRI data*, 6th European Student Conference on Behaviour & Cognition, Padova, Italy.

2019. *A Statistical approach to the alignment of fMRI data*, 12th IBS - Italian Region conference, Napoli. Italy.

SYMPOSIA

2022. *Generalized Procrustes problem allows to estimate subject-specific functional connectivity in fMRI data*, International Meeting of the Psychometric Society (IMPS), Bologna, Italy.

2021. *Generalized Procrustes problem allows to estimate subject-specific functional connectivity in fMRI data*, Italian Psychology Association (AIP), Lecce, Italy.

2021. Predicting the Impact of COVID-19 on the Emergency Departments in Lombardy, Italy, Joint Statistical Meetings (JSM), Seattle. USA.

POSTER

2022. Procrustes analysis for high dimensional data, Statistical methods and models for complex data, Padova, Italy.

2020. Improving the Functional Alignment of fMRI Data Using Special Brain Information, Organization for Human Brain Mapping (OHBM), Montreal, Canada.

2020. PRDA package: Enhancing Statistical Inference via prospective and Retrospective Design Analysis, European R users meeting (eRum), Milan, Italy.

2019. A Statistical approach to the alignment of fMRI data, Zero Three, Perspectives and New Research in Psychometrics, Padova, Italy.

Teaching Experience

COURSE COORDINATOR

ay 2023-2024	Health Data Science , Master's degree in Data Analytics for Business and Society, Ca' Foscari University of Venice. (in English)	30 hours, (6 CFU)
ay 2022-2023	Statistic , Ph.D. in Neuroscience, University of Padova. (in English)	8 hours
ay 2022-2023	Health Data Science , Master's degree in Data Analytics for Business and Society, Ca' Foscari University of Venice. (in English)	30 hours, (6 CFU)
ay 2022-2023	Statistic 2 , Bachelor's degree in business administration, Ca' Foscari University of Venice.	30 hours, (6 CFU)

LECTURER

ay 2023-2024	Statistics exercises 1-2 , Bachelor's degree in economics and business, Ca' Foscari University of Venice.	30 hours
ay 2022-2023	Statistics exercises 1-2 , Bachelor's degree in economics and business, Ca' Foscari University of Venice.	30 hours
ay 2022-2023	Exercises - Psychometric , Bachelor's degree in science and techniques psychology, University of Padova.	30 hours
ay 2021-2022	Laboratory - Statistical Learning for Data Science , Master's degree in Data Analytics for Business and Society, Ca' Foscari Università of Venice. (in English)	10 hours
ay 2021-2022	Exercises - Psychometric , Bachelor's degree in science and techniques psychology, University of Padova.	30 hours
ay 2020-2021	Applied statistical models (module I) , Bachelor's degree in Statistical Sciences University of Padova.	20 hours
ay 2020-2021	Exercises - Psychometric , Bachelor's degree in science and techniques psychology, University of Padova.	30 hours
ay 2020-2021	Exercises - Psychometric , Bachelor's degree in psychological sciences of development, personality, and interpersonal relations, University of Padova.	28 hours

SEMINAR

ay 2022-2023	Permutation-based cluster inference in Electroencephalography (EEG) data , Lecture within the course "Psychometrics for Cognitive Neuroscience," Master's Degree in Statistical Science, University of Padova.	2 hours
ay 2021-2022	Permutation-based cluster inference in Electroencephalography (EEG) data , Lecture within the course "Psychometrics for Cognitive Neuroscience," Master's Degree in Statistical Science, University of Padova.	2 hours
ay 2020-2021	Permutation-based cluster inference in Electroencephalography (EEG) data , Lecture within the course "Psychometrics for Cognitive Neuroscience," Master's Degree in Statistical Science, University of Padova.	2 hours

Supervision/Co-supervision Thesis

(ongoing)	Pigato Christian , Bachelor's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(July 2023)	Taverna Martina , Bachelor's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(July 2023)	Pardon Marta , Bachelor's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(ongoing)	Rosolin Gaia , Master's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(ongoing)	Sayna Eghbalpour , Master's thesis (co-supervisor), Department of Economics, Ca' Foscari University of Venice
(ongoing)	Romano Elisabetta , Master's thesis (co-supervisor), Department of Economics, Ca' Foscari University of Venice
2021	Pilot Giovanna , Bachelor's thesis (co-supervisor), Department of Statistical Sciences, University of Padova
2021	Corbetta Daniela , Master's thesis (co-supervisor), Department of Statistical Sciences, University of Padova

Institutional organizational and service activities

- 2022-2023 **Committee member for 1 research grant**, Topic: "Support to the data collection and analysis on the economic, health and social situation of the Veneto Region under the collaboration between the University of Ca' Foscari and the Regional Council of the Veneto Region," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2022-2023 **Committee member for 1 research grant**, Topic: "Urgent measures to contain the COVID-19 epidemic, on SARS-CoV-2 vaccination, justice and public competitions," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2022-2023 **Committee member for 1 research grant**, Topic: "Theoretical and data-driven study of the dynamics and mechanisms that generate health inequalities among sub-populations in terms of longevity and healthy aging," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2022-2023 **Committee member for 1 research grant**, Topic: "Territorial governance and social innovation: methods and practice. Research coordination and methodological support," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2022-2023 **Committee member for 1 research grant**, Topic: "Supporting the collection, analysis and processing of data concerning the economic, social and health situation in Veneto as part of the collaboration between Ca' Foscari University of Venice and the Veneto Regional Council," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2021-2022 **Committee member for 2 research grants**, Topic: "Uni 4 Justice, Operational Statistical Profiles to Support the Development of Innovative Process Office Tools," Department of Economics, Ca' Foscari University of Venice, Italy.
- 2021-2022 **Committee member for 4 research grants**, Topic: "Uni 4 Justice, Operational legal/statistical profiles to support the development of innovative tools for the trial office," Department of Economics, Ca' Foscari University of Venice, Italy.

Outreach & Professional Development

LANGUAGES

Italian (mother tongue), English (C1), Spanish

ORGANIZATION OF SCIENTIFIC EVENTS

Meeting Social Statisticians, 2- 3 December 2022, Treviso, Italy, Ca' Foscari University of Venice

International Winter School - MRInference: from Memberships data to knowledge, 15- 19 February 2021, online, University of Padova

PROGRAMMING LANGUAGES

Statistical Packages: R Software -SPSS - SAS - STATA

Languages: R - Python - Matlab -C++ - Markdown - SQL

Other software: LaTeX - Gimp -FSL - GIT - Moodle

Author and/or maintainer of R packages: pARI (CRAN), pecora (CRAN), PRDA (CRAN), ARI (CRAN), rotoDistance (GitHub), alignProMises (GitHub), ARleeg (GitHub), fMRIdata (Github), eegusta (GitHub).

Author and/or maintainer of Python modules: PromisesModel.

REFeree

Psychometrika, Biometrical Journal, Statistical Methods & Applications, International Journal of Environmental Research and Public Health, Behavioral Sciences, Animals, Journal of Affective Disorders, Intensive Care Medicine, Axioms, Symmetry, Human Brain Mapping

PROFESSIONAL MEMBERSHIPS

Publications

JOURNAL ARTICLES

- [1] **Andreella, A.**, Finos, L., Weeda, W., Hemerik, J., and Goeman, J. 2023. Permutation-based true discovery proportions for fMRI cluster analysis. *Statistics in medicine*, doi: 10.1002/sim.9725
- [2] **Andreella, A.**, De Santis, R., Vesely, A. and Finos, L. 2023. Procrustes-based distances for exploring between-matrices similarity, *Stat Methods Appl* (2023). doi: 10.1007/s10260-023-00689-y
- [3] **Andreella, A.**, Finos, L. and Lindquist, M. 2022. Enhanced hyperalignment via spatial prior information. *Human Brain Mapping*, doi: 10.1002/hbm.26170
- [4] **Andreella, A.** and Livio Finos. 2022. Procrustes analysis for high dimensional data. *Psychometrika*. doi: 10.1007/s11336-022-09859-5
- [5] Pignoni, A., Delvecchio, G., Dusi, N., Schiena, G., **Andreella, A.**, Finos, L., Cecchetto, F., Perlini, C., Rossetti, M. G., Ferro, A., Bellani, M., Lasalvia, A., Ruggeri, M. and Brambilla, P. 2022. Insula volumes in first-episode and chronic psychosis: A longitudinal MRI study. *Schizophrenia Research* doi:10.1016/j.schres.2021.12.048, 241, 14–23.
Andreella, A. performed the data analysis and writing of the statistical part of the article.
- [6] Zandonella Callegher, C., Bertoldo, G., Toffalini, E., Vesely, A., **Andreella, A.**, Pastore, M. and Altoè, G. 2021. PRDA: An R package for Prospective and Retrospective Design Analysis. *Journal of Open Source Software*, 6(58), 2810, ISSN: 2475-9066, doi: 10.21105/joss.02810.
Andreella, A. participated in the creation of the R package.
- [7] Ciappolino, V., DelVecchio, G., Prunas, C., **Andreella, A.**, Finos, L., Caletti, E., Siri, F., Mazzocchi, A., Botturi, A., Turolo, S., Agostoni, C. and Brambilla, P. 2020. The Effect of DHA Supplementation on Cognition in Patients with Bipolar Disorder: An Exploratory Randomized Control Trial. *Nutrients* doi: 10.3390/nu12030708, 12(3), 708, ISSN: 2072-6643.
Andreella, A. performed the data analysis and writing of the statistical part of the article.
- [8] Delvecchio, G., Caletti, E., Perlini, C., Siri, F. M., **Andreella, A.**, Finos, F., Bellani, M., Fabbro, F., Lasalvia, A., Bonetto, C., Cristofalo, D., Scocco, P., D'Agostino, A., Torresani, S., Imbesi, M., bellini, F., Veronese, A., Bressi, V. and Brambilla, P. 2019. Altered syntactic abilities in first-episode patients: An inner phenomenon characterizing psychosis. *European Psychiatry* doi: 10.1016/j.eurpsy.2019.08.001, 61, 119-126, ISSN: 0924-9338.
Andreella, A. performed the data analysis and writing of the statistical part of the article.
- [9] Caletti, E., Delvecchio, G., **Andreella, A.**, Finos, L., Perlini, C., Tavano, A., Lasalvia, A., Bonetto, C., Cristofalo, D., Lamonaca, D., Ceccato, C., Pileggi, F., FaustoMazzi, F., Santonastaso, P., Ruggeri, M., Bellani, M. and Brambilla, P. 2018. Prosody abilities in a large sample of affective and nonaffective first episode psychosis patients. *Comprehensive Psychiatry* doi: 10.1016/j.comppsy.2018.07.004, 86, 31-38, ISSN: 0010-440X.
Andreella, A. performed the data analysis and writing of the statistical part of the article.

REFEREED CONFERENCE PROCEEDINGS

- [10] **Andreella, A.**, Monasta, L. and Campostrini, S. 2023. A novel definition of co-morbidity based on Global Burden of Diseases weights. *Book of Short Papers SIS 2023*, 566–571, ISBN: 9788891935618
- [11] **Andreella, A.** and Vesely, A. 2023. How active is a genetic pathway? Comparative analysis of post-hoc permutation-based methods. *Book of Short Papers SIS 2023*, 1268–1273, ISBN: 9788891935618
- [12] **Andreella, A.**, De Santis, R. and Finos, L. 2022. Valid inference for group analysis of functionally aligned fMRI images. *Book of Short Papers SIS 2022*, 1987–1992, ISBN: 9788891932310
- [13] Vesely, A., **Andreella, A.**, Goeman, J. and Finos, L. 2022. Resampling-Based Inference for High-Dimensional Regression. *Book of Short Papers SIS 2022*, 1327–1332, ISBN: 9788891932310
- [14] Vesely, A., Finos, L., Goeman, J. J., and **Andreella, A.** 2021. Valid Double-Dipping via Permutation-Based Closed Testing. *Book of Short Papers SIS 2021*, ISBN: 9788891927361
- [15] **Andreella, A.** and Finos, L. 2021. Functional alignment by the "light" approach of the von Mises-Fisher-Procrustes model. *Book of Short Papers SIS 2021*, ISBN: 9788891927361
- [16] **Andreella, A.** and Finos, L. 2020. A Statistical Approach to the Alignment of fMRI Data. *Book of Short Papers SIS 2020*, ISBN: 9788891910776

UNDER REVISION OR IN PREPARATION

- [17] **Andreella, A.**, Mira, A., Balafas, S., Wit, E. C., Ruggeri, F., Nattino, G., Ghilardi, G., and Bertolini, G. 2022. A predictive model for planning emergency events rescue during COVID-19 in Lombardy, Italy. *arXiv:2203.14287v1 [stat.AP]* [under revision]
- [18] **Andreella, A.**, Aliverti, E., Caldura, F., and Campostrini, S. 2023. Spatial clusters for demand and supply of childcare services in Italy [submitted]
- [19] **Andreella, A.**, Monasta, L., and Campostrini, S. 2023. A novel comorbidity index in Italy based on diseases detected by the surveillance system PASSI and the Global Burden of Diseases disability weights [submitted]
- [20] **Stocchero, M.**, Finos, L., Scarpa, B., and Andreella, A. 2023. Toward a power analysis and sample size estimation for PLS-based methods [working paper]
- [21] **Andreella, A.**, Vesely, A., Hemerik, J, Wouter, W., and Goeman, J. 2023. Selective inference for fMRI cluster-wise analysis, issues, and recommendations for template selection: A comment on Blain et al *arXiv:2307.02115v1 [stat.AP]*

PHD THESIS

- [22] **Andreella, A.** 2020. Challenges in Functional Magnetic Resonance Imaging (fMRI) Data Analysis: From Functional Alignment to Selective Inference.