

Angela Andreella

ASSITANT PROFESSOR OF SOCIAL STATISTICS · RTD-A

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Current Position

2021-now **Assistant Professor of Social Statistics - fixed term, [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 Campopostri. 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).

Member of the statistics and psychometrics group (PsychoStat, <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 [4], 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 [3], [5], [6], [7].

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.

Awards, Fellowships, & Grants

2021, 3 years	Grant PON, Ricerca e Innovazione: "SOcial Innovation Data Science", role: Principal Investigator. , Department of Economics, Ca' Foscari University of Venice	109032.09 euros
2021, 24 months	Grant BIRD2020: "A Bayesian Approach to the Procrustes-based problem", role: Principal Investigator. , 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", role: Principal Investigator. , 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. *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

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

2022. Spatial clusters for demand and supply of childcare services in Italy, Incontro statistici sociali, Treviso. Italy.

2022. Functional alignment enhances Electroencephalography (EEG) data's group analysis, Associazione Italiana di Psicologia (AIP), Padova. Italy

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

2022. Valid inference for group analysis of functionally aligned MRI images, Società Italiana di Statistica (SIS) 2022, Caserta. Italy.

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

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

2021. Functional alignment by the “light” approach of the von Mises-Fisher-Procrustes model, Società Italiana di Statistica (SIS) 2021, Milano. 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, Bressanone. 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 2022), Bologna. Italy.

2021. Generalized Procrustes problem allows to estimate subject-specific functional connectivity in fMRI data, Associazione Italiana di Psicologia (AIP), Lecce. Italy.

2021. Predicting the Impact of COVID-19 on the Emergency Departments in Lombardy, Italy, 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), Milano. Italy.

2019. A Statistical approach to the alignment of fMRI data, Zero Tre, Prospettive e Nuove Ricerche in Psicometria, Padova. Italy.

Teaching Experience

COURSE COORDINATOR

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 Università of Venice. ((in English))	30 hours, (6 CFU)
aa 2022-2023	Statistic 2 , Bachelor's degree in business administration, Ca' Foscari University of Venice.	30 hours, (6 CFU)

LECTURER

ay 2022-2023	Statistics Exercises 1-2 , Bachelor's degree in economics and business, Ca' Foscari University of Venice.	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) , Laurea triennale in scienze statistiche Università degli studi di 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 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)	Sayna Eghbalpour , Master's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(ongoing)	Taverna Martina , Bachelor's thesis (supervisor), Department of Economics, Ca' Foscari University of Venice
(ongoing)	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
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: "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 Venice
- 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 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 Venice
- 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 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 Venice

Outreach & Professional Development

LANGUAGES

Italian (mother tongue), English, 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), rotoDistance (GitHub), alignProMises (GitHub), ARleeg (GitHub).

Author and/or maintainer of Python modules: PromisesModel.

REFeree

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

PROFESSIONAL MEMBERSHIPS

Società Italiana di Statistica (SIS), Società Italiana di Biometria (SIB), International Organization for Human Brain Mapping (OHBM), Institute of Mathematical Statistics (IMS), Associazione Italiana di Psicologia (AIP)

Publications

JOURNAL ARTICLES

- [1] **Andreella, A.**, Finos, L., e Lindquist, M. 2022. Enhanced hyperalignment via spatial prior information. Human Brain Mapping doi: 10.1002/hbm.26170
- [2] **Andreella, A.**, Livio Finos. 2022. Procrustes analysis for high dimensional data. Psychometrika. doi: 10.1007/s11336-022-09859-5
- [3] Pigoni, 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.
- [4] Zandonella Callegher, C., Bertoldo, G., Toffalini, E., Vesely, A., **Andreella, A.**, Pastore, M., e 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.
- [5] Ciappolino, V., DelVecchio, G., Prunas, C., **Andreella, A.**, Finos, L., Caletti, E., Siri, F., Mazzocchi, A., Botturi, A., Turolo, S., Agostoni, C. e 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.
- [6] 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., e 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.
- [7] 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., e 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

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

- [15] **Andreella, A.**, De Santis, R., Vesely, A. and Finos, L. 2022. Procrustes-based distances for exploring between-matrices similarity, arXiv:2301.06164 [stat.AP]
- [16] **Andreella, A.**, Mira, A., Balafas, S., Wit, E. C., Ruggeri, F., Nattino, G., Ghilardi, G., e Bertolini, G. 2022. A predictive model for planning emergency events rescue during COVID-19 in Lombardy, Italy. arXiv:2203.14287v1 [stat.AP]
- [17] **Andreella, A.**, Finos, L., Weeda, W., Hemerik, J., and Goeman, J. 2022. Permutation-based true discovery proportions for fMRI cluster analysis. arXiv:2012.00368 [stat.AP] .

- [18] **Andreella, A.**, Aliverti, E., Caldura, F., and Campostrini, S. 2023. Spatial clusters for demand and supply of childcare services in Italy [working paper]
- [19] **Stocchero, M.**, Finos, L., Scarpa, B., and Andreella, A. 2023. Towards a power analysis and sample size estimation for PLS-based methods [working paper]

PHD THESIS

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