

# Agostino Di Ciaccio

---

Phone: +39 06 49910709 (off.);

[Agostino.diciaccio@uniroma1.it](mailto:Agostino.diciaccio@uniroma1.it); [agostino.diciaccio@gmail.com](mailto:agostino.diciaccio@gmail.com)

## Work experience

*Current position:* full professor of Statistics at Sapienza University of Rome, dept. of Statistics (since 2001).

*Previous positions:* assistant professor (1990-1992) of Statistics at Sapienza University of Rome and associate professor (1992-2001) of Statistics at University of Urbino.

## Education:

Graduated in Statistics at Sapienza University of Rome, dept. of Statistics (1982);  
PhD in Methodological Statistics, Sapienza University of Rome, dept. of Statistics (1988), with the thesis " Maximum Association Criteria and Optimal Scaling - a unified approach to the analysis of qualitative and mixed measurement level variables ".

## Teaching in master's degrees:

Data Mining and classification;  
Big Data Analytics;  
Laboratory of Machine Learning.

## Other teaching activities

Deep learning with Python for the analysis of Big-Data (professional course, university of Rome, La Sapienza);  
SAS Viya – Visual Data Mining and Machine Learning (Master “Big Data. Metodi statistici per la società della conoscenza”, university of Rome, La Sapienza);  
Machine learning with Python (Master “Customer Experience & Social Media Analytics”, university of Tor Vergata, Rome);  
Organizer of summer school, SAS-Campus and SAS certifications for machine learning.

## Scientific interests:

Machine Learning, Deep Learning, Data mining, Text and Web mining, Analysis of Big Data, Statistical Inference, Multivariate Statistics.

## Academic offices:

President of the didactic council “Statistics and decision sciences” (2009 - 2017);  
member of the PhD board in Methodological Statistics (2001 - 2012);  
member of the Doctoral School in Statistics, Sapienza University of Rome (2012 - 2017);  
coordinator of European Master in Official Statistics (EMOS) for the Dept. of Statistics of Sapienza University (2012-2019);  
member of the faculty board (2008-2011);  
member of the SIS board (2006-2010);  
director of the computing center, faculty of Economics, Urbino university (1995-2001).

### Memberships:

Italian Statistical Society (SIS);  
ISI (International Statistical Institute);  
IASC (International Association for Statistical Computing);  
IFCS (International Federation of Classification Societies).

### Authorship:

Author of over 50 papers published in journals, conference proceedings, volumes.  
Author of the most widespread book in Italy of introduction to statistics (McGraw Hill eds.)

### Activities in scientific institutions and Journals:

Member of the technical-scientific committee of DIGILAB (since 2015);  
organizer of the international scientific meeting: "Non-linear methods and data analysis" (Rome, Sapienza, 2000);  
organizer of the international scientific meeting: "Statistical Methods for the analysis of large datasets." (SIS, 2009);  
guest Editor of the special issue of the journal Computational Statistics and Data Analysis "Software and Applications for Multiway Data Analysis", 1994;  
guest Editor of a special issue of the journal Computational Statistics and Data Analysis (with S. Borra) entitled "Nonlinear Methods and Data Mining", February 2002;  
team manager of the EU project "VL-C@TS", Virtual Library for Computer assisted Training in Statistics (2000-2002);  
member of the organizing committee of the international conference "MULTIWAY '88" University of Rome "La Sapienza" (1988);  
organizer and chairman of the session "Resampling techniques in nonparametric methods" at the XLIII Scientific Meeting of the SIS (2006);  
member of the scientific committee of the 2011 SIS meeting "Statistics in the 150 years of the Unification of Italy";  
member of the scientific committee of the 10th Scientific Meeting of the Classification and Data Analysis Group (2015);  
coordinator of the scientific committee and of the organizing committee of the international meeting "Nonlinear methods and Data Mining", Rome, CNR (2000);  
member of the editorial board of the Journal of Italian Statistical Society (1991-1995);  
referee for the journal METRON, JISS, CSDA, SOCI, INS;  
member of the Advisory Board of the international magazine Metron (since 2014);  
scientific director of the course "Deep learning with Python for the analysis of Big-Data" (Sapienza, 2019-2020).

### Computer skills

Good knowledge of the most common programming languages (C, C++, R, Python) and major statistical packages (SAS, SPSS, JMP, IMSL, Weka).

## Selected publications

- Bove G., Di Ciaccio A. (1986). Typologies and associative structures: a comparison between different methods, COMPSTAT 86 - Short communications and posters, Univ. "La Sapienza", ROMA 1986.
- Di Ciaccio A. (1986). Representation of a new association measure between categories using "Multidimensional Scaling" in Data Analysis and Informatics, E. Diday and al. (eds.), North Holland 1986.
- Di Ciaccio A. (1986). Un nuovo metodo di cluster per l'individuazione di sistemi a livello sub-regionale, in Atti della XXXIII Riunione Scientifica della S.I.S., Bari, 1986.
- Bove G., Di Ciaccio A. (1987). A factorial method for the analysis of three way data in tensor spaces, in Data Analysis and Informatics, E. Diday and al. (eds.), North Holland 1987.
- Di Ciaccio A. (1988). Some considerations on the quantification of categorical data, Research-Report, Department of Data Theory, University of Leiden, 1988.
- Di Ciaccio A. (1988). Criteri e metodi di quantificazione dei caratteri qualitativi, Atti della XXXIV Riunione Scientifica della SIS, Siena, 1988, Nuova Editrice Italiana.
- Di Ciaccio A., De Leuw J. (1988). Cluster Analysis per matrici di dati a due o più indici e con livello di misurazione misto, in atti della riunione italiana soci IFCS, Erice 1988.
- Di Ciaccio A. (1988). Multiway'88 - Software Guide. (A. Di Ciaccio and G. Bove eds.), Dip. Statistica, Probabilità e Stat. Applicate, Roma, 1988.
- Bove G., Di Ciaccio A. (1989). Comparison among three factorial methods for the analysis of three-mode data, in "MULTIWAY DATA ANALYSIS" (Coppi & Bolasco eds.), 103-113, North Holland, Amsterdam, ISBN:0-444-87410-0.
- Di Ciaccio A. (1990). Metodi di classificazione per l'analisi simultanea di caratteri qualitativi e quantitativi, Atti della XXXV Riunione Scientifica della SIS, Padova 1990, CEDAM.
- Di Ciaccio A. (1990). L'analisi simultanea dei caratteri qualitativi e quantitativi attraverso la parametrizzazione dei dati, Metron vol. XLVIII n.1-4 1990, 333-364.
- Di Ciaccio A. (1992). Simultaneous clustering of qualitative and quantitative data with missing observations, Rivista di Statistica Applicata, V. 4, n. 4, 1992, 599-610.
- Coppi R., Di Ciaccio A. (1992). The methodological impact of nonlinear analysis, Rivista di Statistica Applicata V. 4, n. 4, 1992, 407-428.
- Coppi R., Di Ciaccio A. (1994). Modelli multi lineari per l'analisi di dati qualitativi, atti della XXXVII Riunione Scientifica della SIS, San Remo, vol. 1, 1994, 369-380.
- Bove G., Di Ciaccio A. (1994). A user-oriented overview of multiway methods and software, Computational Statistics & Data Analysis, special issue "Software And Applications For Multiway Data Analysis" (R. Coppi and A. Di Ciaccio eds.), North Holland, n. 18, 1994, 15-37.
- Di Ciaccio A. (1994). Multiway Data Analysis - Software and Applications, Computational Statistics and Data Analysis, special issue (R. Coppi and A. Di Ciaccio eds.), North Holland, n. 18, 1994.
- Borra S., Di Ciaccio A. (1996). Introduzione alla Statistica descrittiva - volume e ipermedia - McGraw Hill, Milano 1996.
- Borra S., Di Ciaccio A. (1998). Non-parametric regression models for the conjoint analysis of qualitative and quantitative data, in "Advances in data science and classification", editors A. Rizzi, M. Vichi, H.H.Bock, Springer Verlag, Berlin, 1998.
- Borra S., Di Ciaccio A. (1999). Using qualitative information and neural networks for forecasting purposes in financial time series, in Classification and Data Analysis, Theory and Application (Vichi and Opitz eds), Springer, Berlin 1999.

- Borra S., Di Ciaccio A. (1999). Bagging and Boosting performance in Projection Pursuit Regression, proceedings of ISI'99, Helsinki 1999.
- Borra S, Di Ciaccio A. (2000). Aggregazione di funzioni di approssimazione nei metodi regressivi non-parametrici. In: Proceedings XL Riunione Scientifica SIS. Firenze, 26-28 Aprile 2000, Padova: CLEUP.
- Borra S., Di Ciaccio A. (2001). Performance evaluation of Bagging and Boosting in nonparametric regression. METRON, vol. LIX , 3-4; p. 141-156, ISSN: 0026-1424.
- Di Ciaccio A. (2001). MIXISO: a non-hierarchical clustering method for mixed mode data. In: Borra S., Rocci R., Vichi M., Schader M.. Advances in classification and data analysis, Studies in Classification, Data Analysis and knowledge Organization. p. 245-253, BERLIN: Springer-Verlag, ISBN/ISSN: 978-3540414889.
- Borra S, Di Ciaccio A. (2001). Reduction of Prediction Error by Bagging Projection Pursuit Regression. In: Borra S., Rocci R., Vichi M., Schader M., Advances in Classification and Data Analysis; Studies in Classification, Data Analysis, and Knowledge Organization. p. 241-248, BERLIN: Springer-Verlag, ISBN/ISSN: 978-3-540-41488.
- Di Ciaccio A., Montanari G.E. (2001). A nonparametric regression estimator of a finite population mean. In: CLADAG - Book of Short Papers. Palermo, 2001, p. 173-176.
- Borra S, Di Ciaccio A. (a cura di) (2002). Nonlinear Methods and Data Mining. (Special issue of Computational Statistics and Data Analysis). Amsterdam: North Holland, vol. 38-4.
- Borra S, Di Ciaccio A. (2002). Improving nonparametric regression methods by bagging and boosting. Computational Statistics and Data Analysis, vol. 38-4; p. 407-420, ISSN: 0167-9473.
- Di Ciaccio A., Montanari G.E (2002). Non parametric methods and data mining applications. In: Proceedings SIS 2002, Plenary and specialized sessions, Padova: Cleup, vol. 1, p. 339-348.
- Bove G, Di Ciaccio A. (a cura di) (1994). Software and application for Multiway Data Analysis (special issue of CSDA). Amsterdam: North-Holland, vol. 18.
- Borra S., Di Ciaccio A. (2004). Methods to compare nonparametric classifiers and to select the predictors. In: M. Vichi, P. Monari et al, New Developments in classification and data analysis (Studies in Classification, Data Analysis and Knowledge Organization). p. 11-20, BERLIN: Springer-Verlag, ISBN/ISSN: 3-540-23809-3.
- Di Ciaccio A., Vallely T (2007). Use of non-parametric methods for the imputation of missing data. A comparison based on extensive Montecarlo simulations. In: Proceeding of SCo.o 2007. Venezia, September 6-8, 2007.
- Borra S., Di Ciaccio A. (2008). Statistica. Metodologie per le scienze economiche e sociali. 2a edizione. MILANO: McGraw Hill, p. 1-513, ISBN: 978-88-386-6428-1.
- Di Ciaccio A., Borra S (2008). Estimators of extra-sample error for non-parametric methods. A comparison based on extensive simulations. Roma: Dip. di Statistica, Prob. e Statistiche Applicate, p. 1-40.
- Borra S., Di Ciaccio A. (2008). The estimation of prediction error for neural networks: a simulation study. In: Proceedings ERCIM'2008. Neuchâtel, Switzerland, 19-21 June 2008.
- Di Ciaccio A. (2008). Bootstrap and Nonparametric Predictors to Impute Missing Data. In: Proceedings of joint meeting of Societe Francophone de Classification and Classification and Data Analysis Group, Book of short papers. 2008, Edizioni Scientifiche Italiane, p. 147-150, ISBN/ISSN: 978-88-495-1656-2.
- Borra S., Di Ciaccio A. (2010). Measuring the prediction error. A comparison of cross-validation, bootstrap and covariance penalty methods. Computational Statistics & Data Analysis, V. 54, 12, p. 2976-2989, ISSN: 0167-9473, doi: 10.1016/j.csda.2010.03.004
- Borra S.; A. Di Ciaccio (2010) Variable selection in a predictive approach. in :CLADAG 2009, book of abstracts, 8 - 10 September 2010 Firenze.

- Di Ciaccio A. (2011). Bootstrap and Nonparametric Predictors to Impute Missing Data. In: Fichet D., Piccolo D., Verde R., Vichi M., Classification and Multivariate Analysis for Complex Data Structures. Series: Studies in Classification, Data Analysis, and Knowledge Organization. vol. 1, p. 301-309, BERLIN: Springer, ISBN/ISSN: 978-3-642-13311-4.
- Di Ciaccio A., Giorgi G.M.(2012). Una nuova procedura di imputazione di dati mancanti basata sugli alberi di decisione, *Italian Review of Economics, Demography and Statistics* (ISSN:0035-6832), 149- 156, 66 n.1;
- Di Ciaccio A.; Coli M.; Angulo Ibanez J. M. eds. (2012) Advanced Statistical Methods for the Analysis of Large Datasets. Studies in Theoretical and Applied Statistics. Springer-Verlag Heidelberg (Germany). ISBN:978-36-422-1036-5.
- Di Ciaccio A., Giorgi G.M. (2012). La scelta delle variabili in un modello di regressione lineare. *Italian Review of Economics, Demography and Statistics*, v. 66, n. 3-4, 87-94.
- Di Ciaccio A., Giorgi G.M.(2013). Statistical analysis of social networks. *Italian Review of Economics, Demography and Statistics*, v. 67, n. 3-4, 103-110.
- Di Ciaccio A., Giorgi G.M. (2014). Machine Learning and text mining to classify tweets on a political leader. *Italian Review of Economics, Demography and Statistics*, v. 68, n. 3-4.
- Di Ciaccio A., Giorgi G.M. (2016). La statistica nell'era dei big-data. In Book of abstracts 53ma riunione scientifica SIEDS, 26-28 Maggio, Roma.
- Di Ciaccio A., Giorgi G.M. (2016). Deep learning for supervised classification. *Italian Review of Economics, Demography and Statistics*, vol. LXX, n. 1. 157-166.
- Di Ciaccio A., Cialone G. (2018). Insolvency prediction by deep learning, in proceedings of Statistics and Data Science - New developments for business and industrial applications.
- Di Ciaccio A., Crobu F. (2019). 2019. An application of deep learning to chest disease detection using images and clinical data, in *Statistical evaluation systems at 360°: techniques, technologies and new frontiers*, pp.397-401, ISBN:978-88-86638-65-4.
- Di Ciaccio A., Crobu F. (2019). Classify X-RAY images using convolutional neural networks, in Cladag 2019, Book of short-papers, pp. 144-147.
- Di Ciaccio Damiano, Maroder Edoardo, Ambrosio Sara, Rossini Francesco Livio, Di Ciaccio Agostino (2019). AI applications in the building process. In: The human dimension of building energy performance, conference proceedings Aicarr (Venezia, 20-22 february 2019), ISBN: 978-88-95620-63-3
- Di Ciaccio A., Cialone G. (2019). Insolvency prediction by deep learning. *International Journal of Data Mining & Knowledge Management Process*, vol. 9 n.6, p.1-12.
- Di Ciaccio A. (2020). Categorical Encoding for Machine Learning, in Book of short papers SIS2020, A. Pollice, N. Salvati, F. Schirripa Spagnolo eds., ISBN 9788891910776, 1048-1053. Pearson Italia.
- Di Ciaccio A., Crobu F. (2021). Deep learning to jointly analyze images and clinical data for disease detection, in *Statistical Learning and Modeling in Data Analysis*, series *Studies in Classification, Data Analysis and Knowledge Organization*, S. Balzano, G.C. Porzio, R. Salvatore, D. Vistocco, M. Vichi (Eds.), p. 47-55, Springer Berlin. ISBN 978-3-030-69944-4, DOI 10.1007/978-3-030-69944-4 (29 giugno 2021).
- Di Ciaccio A. (2021). Neural Networks for high cardinality categorical data. Book of Abstracts and Short Papers, G.C. Porzio, C. Rampichini, C. Bocci eds., 320-323. Firenze University Press, Firenze, ISSN 2704-601X, ISBN 978-88-5518-340-6, DOI 10.36253/978-88-5518-340-6
- Di Ciaccio A. (2022). Optimal Coding of categorical data in machine learning. *To be published on "Studies in Classification, Data Analysis and Knowledge Organization"*.