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University of Bologna  
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## RESEARCH INTERESTS

Bayesian inference, Spatial and spatio-temporal statistics, Point processes, INLA, Change-point analysis, Entropy measures, Epidemiological and environmental data

## CURRENT POSITION

*Junior assistant professor* *November, 2019 - present*  
*Ricercatore a Tempo Determinato di tipo a*  
Department of Statistical Sciences, University of Bologna  
Research project: Statistical models and methods for Big Data analysis

## PREVIOUS POSITIONS

*Temporary Research Fellow* *November, 2018 - November, 2019*  
Department of Statistical Sciences, University of Bologna  
Advisor: Daniela Cocchi  
Research project: Developments in spatial and spatio-temporal data studies

*Temporary Research Fellow* *November, 2016 - October, 2018*  
Department of Statistical Sciences, University of Bologna  
Advisor: Daniela Cocchi  
Research project: New developments in the assessment of spatial configuration for areal and point process data

*Temporary Research Fellow* *November, 2014 - October, 2016*  
Department of Statistical Sciences, University of Bologna  
Advisor: Fedele Greco  
Research project: Bayesian models for spatio-temporal data with changepoint analysis

*PhD Student*

2011-2014

Department of Statistical Sciences, University of Bologna

Advisor: Daniela Cocchi

Research project: A Bayesian changepoint analysis on spatio-temporal point processes

## EDUCATION

*PhD in Statistics*

February, 2015

Department of Statistical Sciences, University of Bologna

Advisor: Daniela Cocchi

Thesis: A Bayesian changepoint analysis on spatio-temporal point processes

*MD Statistical and Economic Sciences*

July, 2011

Faculty of Statistical Sciences, University of Bologna

Advisor: Daniela Cocchi

Thesis: Statistical issues in the assessment of urban sprawl indices

Grade: 110/110 cum laude

*BD International Cooperation and Development*

July, 2008

Faculties of Political Sciences and Statistical Sciences, University of Bologna

Advisor: Cristina Brasili

Thesis: The economy of solidarity: a study on Brazil and its experiences of cooperation with Emilia-Romagna

Grade: 110/110 cum laude

*Language High School Diploma*

July, 2005

Liceo E. Torricelli, Faenza (RA)

Languages: English, German, French

Grade: 100/100 cum laude

*Cambridge Certificate in Advanced English*

June, 2004

C1 level

University of Cambridge

## RESEARCH EXPERIENCE

### Participation to research groups

2016-2019

*Member of the Bologna Research Unit for the project PRIN 2015 (project no. 20154X8K23)*

Principal Investigator: Daniela Cocchi

Research project: Environmental processes and human activities: capturing their interactions via statistical methods

2014-2017

*Member of the Bologna Research Unit for the project FIRB 2012 (project no. RBFR12URQJ)*

Principal Investigator: Francesca Bruno

Research project: Statistical modeling of environmental phenomena: pollution, meteorology, health and their interactions

### Other research experiences

*Scientific collaboration*

2017 - present

La Sapienza University of Rome

Alessio Farcomeni (Associate Professor) and Danilo Alunni Fegatelli (Research Fellow)

Research project: Time interaction point processes

*Visiting PhD Student*

Feb-May, 2013 and Sept 2013-April 2014

School of Mathematics and Statistics, University of Glasgow, UK

Advisor: E. Marian Scott

Research project: A Bayesian changepoint analysis on spatio-temporal point processes

*Visiting PhD Student*

periodically, from April 2013 to April 2014

CREEM, School of Mathematics and Statistics, University of St Andrews, UK

Reference professor: Janine B. Illian

Research project: enrichment of my knowledge of INLA and point processes; R-code writing

*Visiting Scholar*

Mar-May, 2011

School of Mathematics and Statistics, University of Glasgow, UK

Advisor: E. Marian Scott

Research project: Statistical issues in the assessment of urban sprawl indices (MD Thesis)

**Teaching in academic courses**

- University teacher (responsible for the course)* *A.Y. 2019-2020*  
Course: Statistics  
Hours: 40  
Degree programme: BD International Relations and Diplomatic Affairs  
Department of Political Sciences, University of Bologna
- University teacher* *A.Y. 2018-2019*  
Course: Environmental Statistics, part II  
Hours: 10  
Teacher responsible for the course: Fedele Greco  
Degree programme: BD Statistical Sciences  
Department of Statistical Sciences, University of Bologna
- Seminars* *A.Y. 2018-2019*  
Course: Introduction to the statistical software R  
Hours: 16  
Degree programme: MD Statistical, Financial and Actuarial Sciences  
Department of Statistical Sciences, University of Bologna, Campus of Rimini
- University teacher* *A.Y. 2017-2018*  
Course: Biometry and Statistics II, part II  
Hours: 30  
Teacher responsible for the course: Fabrizio Alboni  
Degree programme: MD Environmental Assessment and Management  
School of Science, University of Bologna
- University teacher* *A.Y. 2017-2018*  
Course: Environmental Statistics, part II  
Hours: 10  
Teacher responsible for the course: Fedele Greco  
Degree programme: BD Statistical Sciences  
Department of Statistical Sciences, University of Bologna
- Seminars* *A.Y. 2017-2018*  
Course: Introduction to the statistical software R  
Hours: 16  
Degree programme: MD Statistical, Financial and Actuarial Sciences  
Department of Statistical Sciences, University of Bologna, Campus of Rimini
- University teacher* *A.Y. 2016-2017*  
Course: Statistical modelling for biological and social sciences, part II  
Hours: 20  
Teacher responsible for the course: Giuliano Galimberti  
Degree programme: MD Statistical Sciences  
Department of Statistical Sciences, University of Bologna

*University teacher**A.Y. 2016-2017*

Course: Environmental Statistics, part II

Hours: 20

Teacher responsible for the course: Fedele Greco

Degree programme: BD Statistical Sciences

Department of Statistical Sciences, University of Bologna

*Seminars**A.Y. 2016-2017*

Course: Introduction to the statistical software R

Hours: 15

Degree programme: MD Statistical, Financial and Actuarial Sciences

Department of Statistical Sciences, University of Bologna, Campus of Rimini

*University teacher**A.Y. 2015-2016*

Course: Statistical modelling for biological and social sciences, part II

Hours: 20

Teacher responsible for the course: Giuliano Galimberti

Degree programme: MD Statistical Sciences

Department of Statistical Sciences, University of Bologna

*Seminars**A.Y. 2015-2016*

Course: Introduction to the statistical software R

Hours: 10

Degree programme: MD Statistical, Financial and Actuarial Sciences

Department of Statistical Sciences, University of Bologna, Campus of Rimini

*Seminars**A.Y. 2014-2015*

Course: Introduction to the statistical software R

Hours: 10

Degree programme: MD Statistical, Financial and Actuarial Sciences

Department of Statistical Sciences, University of Bologna, Campus of Rimini

**Teaching assistant***A.Y. 2019-2020*

Course: Crash course in Statistics

Degree programme: BD Economics of Tourism

Department of Management, University of Bologna, Campus of Rimini

*A.Y. 2019-2020*

Course: Statistics

Teacher: Massimo Ventrucci

Degree programme: BD Economics of Tourism

Department of Economics, University of Bologna, Campus of Rimini

*A.Y. 2017-2018*

Course: Statistics

Teacher: Massimo Ventrucci

Degree programme: BD Economics of Tourism

School of Economics, Management and Statistics, University of Bologna, Campus of Rimini

A.Y. 2017-2018

Course: Inference  
 Teacher: Silvia Cagnone  
 Degree programme: BD Statistical Sciences  
 Department of Statistical Sciences, University of Bologna

A.Y. 2017-2018 and 2016-2017

Course: Advanced Statistics  
 Teacher: Carlo Trivisano  
 Degree programme: MD Statistical, Financial and Actuarial Sciences  
 Department of Statistical Sciences, University of Bologna, Campus of Rimini

A.Y. 2017-2018, 2016-2017, 2015-2016, 2014-2015 and 2013-2014

Course: Probability and Statistics  
 Teacher: Carlo Trivisano  
 Degree programme: BD Finance, Insurance and Business  
 Department of Statistical Sciences, University of Bologna, Campus of Rimini

*Demonstrator*

A.Y. 2013-2014

NERC Spatio-temporal workshop  
 Teacher: E. Marian Scott  
 School of Mathematics and Statistics, University of Glasgow

A.Y. 2013-2014 and 2012-2013

Course: Survey Sampling  
 Teacher: Daniela Cocchi  
 Degree programme: BD Statistical Sciences  
 Department of Statistical Sciences, University of Bologna

A.Y. 2012-2013

Course: Advanced Survey Sampling  
 Teacher: Daniela Cocchi  
 Degree programme: MD Statistics, Economics and Business  
 Department of Statistical Sciences, University of Bologna

*Student tutor*

A.Y. 2011-2012

Degree programme: BD Statistical Sciences  
 Department of Statistical Sciences, University of Bologna

**Other teaching-related activities***Thesis co-advisor*

A.Y. 2018-2019

Student: Irene Baratella  
 Advisor: Daniela Cocchi  
 Thesis: Urban sprawl in metropolitan cities: an entropy-based measure  
 Degree programme: MD Statistical Sciences  
 Department of Statistical Sciences, University of Bologna

**Scientific papers in journals**

ALTIERI L., COCCHI D., ROLI G. (2019)

Advances in spatial entropy measures

Journal: Stochastic Environmental Research and Risk Assessment

Editor: Springer

ISSN: 1436-3240 (Print) 1436-3259 (Online)

DOI: 10.1007/s00477-019-01686-y

Ranking: A (ANVUR); A (GEV13) - Citations: 1 (Springer Citation Alert)

ALTIERI L., COCCHI D., ROLI G. (2019)

Measuring heterogeneity in urban expansion via spatial entropy

Journal: Environmetrics, 30(2), e2548

Editor: Wiley

ISSN: 1099-095X (Online)

DOI: 10.1002/env.2548

Ranking: A (ANVUR); B (GEV13) - Citations: 1 (Google Scholar)

ALTIERI L., COCCHI D., ROLI G. (2018)

A new approach to spatial entropy measures

Journal: Environmental and Ecological Statistics, 25(1), 95-110

Editor: Springer

ISSN: 1352-8505 (Print) 1573-3009 (Online)

DOI: 10.1007/s10651-017-0383-1

Ranking: B (GEV13) - Citations: 4 (Google Scholar)

ALTIERI L., COCCHI D., GRECO F., ILLIAN J.B., SCOTT E.M. (2016)

Bayesian P-splines and advanced computing in R for a changepoint analysis on spatio-temporal point processes

Journal: Journal of Statistical Computation and Simulation, 86(13), 2531-2545

Editor: Taylor & Francis

ISSN: 0094-9655 (Print); 1563-5163 (Online)

DOI: 10.1080/00949655.2016.1146280

Ranking: A (ANVUR); C (GEV13) - Citations: 2 (Google Scholar)

ALTIERI L., SCOTT E.M., COCCHI D., ILLIAN J.B. (2015)

A changepoint analysis of spatio-temporal point processes

Journal: Spatial Statistics, 14, 197-207

Editor: Elsevier

ISSN: 2211-6753

DOI: 10.1016/j.spasta.2015.05.005

Ranking: A (ANVUR); A (GEV13) - Citations: 10 (Google Scholar)

ALTIERI L., COCCHI D., PEZZI G., SCOTT E.M., VENTRUCCI M. (2014)

Urban sprawl scatterplots for Urban Morphological Zones data

Journal: Ecological Indicators, 36, 315-323

Editor: Elsevier

ISSN: 1470-160X

DOI: 10.1016/j.ecolind.2013.07.011

Ranking: A (ANVUR); A (GEV13) - Citations: 46 (Google Scholar)

ALTIERI L., COCCHI D., ROLI G. (2018)  
SpatEntropy: Spatial Entropy measures in R  
<https://arxiv.org/abs/1804.05521>

ALTIERI L., COCCHI D., ROLI G. (2018)  
Measuring heterogeneity in urban expansion via spatial entropy  
<https://arxiv.org/abs/1805.04274>

ALTIERI L., COCCHI D., ROLI G. (2017)  
The use of spatial information in entropy measures  
<https://arxiv.org/abs/1703.06001>

### Scientific papers in conference proceedings

ALTIERI L., GRECO F., TRIVISANO C. (2018)  
The Mellin transform as a tool for prior elicitation in disease mapping  
Proceedings of the 23rd International Conference on Computational Statistics (COMPSTAT 2018), Iasi, Romania, August 28-31 2018  
Editor: International Statistical Institute (ISI); Curran Associates, Inc.  
ISBN: 978-1-5108-7265-3

ALTIERI L., ROLI G. (2018)  
Estimation of entropy measures for categorical variables with spatial correlation  
Proceedings of SIS 2018, Palermo, June 20-22, 2018  
Editors: Antonino Abbruzzo, Eugenio Brentari, Marcello Chiodi, Davide Piacentino  
Publisher: Pearson  
ISBN: 9788891910233

ALTIERI L., COCCHI D., ROLI G. (2017)  
The use of spatial information in entropy measures  
Proceedings of TIES-GRASPA Conference, Bergamo, July 24-26, 2017  
Editor: GRASPA Working Papers Series - Michela Cameletti and Francesco Finazzi  
ISBN: 2037-7738

ALTIERI L., COCCHI D., ROLI G. (2017)  
The use of spatial information in entropy measures  
Proceedings of Spatial statistics: one world, one health, Lancaster, July 4-7, 2017

ALTIERI L., GRECO F. (2016)  
Using Bayesian P-splines for modelling spatial point process data  
Proceedings of International Workshop on Statistical inference for assessing and monitoring natural resources, Siena, November 10-11, 2016  
<https://www.deps.unisi.it/sites/st02/files/allegatiparagrafo/17-10-2016/bookofabstracts.pdf>

ALTIERI L., COCCHI D., ROLI G. (2016)  
The use of spatial information in entropy measures  
Proceedings of International Workshop on Statistical inference for assessing and monitoring natural resources, Siena, November 10-11, 2016  
<https://www.deps.unisi.it/sites/st02/files/allegatiparagrafo/17-10-2016/bookofabstracts.pdf>



ALTIERI L., COCCHI D., GRECO F., SCOTT E.M., ILLIAN J.B. (2015)

Looking for changepoints in spatio-temporal earthquake data

Proceedings of GRASPA 2015, Bari, June 15-16, 2015

Editor: GRASPA Working Papers Series - A. Pollice and A. Fassó

ISSN: 2037-7738

ALTIERI L., GRECO F., TRIVISANO C. (2015)

The effect of gridding data when modelling spatial point patterns

Proceedings of Spatial Statistics, Avignon, June 10-12, 2015

ALTIERI L., SCOTT E.M., COCCHI, D., ILLIAN J.B. (2014)

A Bayesian changepoint analysis on spatio-temporal point processes, with application to radioactive particle data

Proceedings of METMA VII - GRASPA 2014, Turin, September 10-12, 2014

Editor: GRASPA Working Papers Series

ISSN: 2037-7738

ALTIERI L., SCOTT E.M., COCCHI, D., ILLIAN J.B. (2014)

A Bayesian changepoint analysis on spatio-temporal point processes

Proceedings of IBC 2014, Florence, July 5-11, 2014

ALTIERI L., SCOTT E.M., ILLIAN J.B. (2014)

A changepoint analysis on spatio-temporal point processes

Proceedings of SIS 2014, Cagliari, June 11-13, 2014, pp. 1-6

Editor: CUEC Editrice - S. Cabras, T. Di Battista and W. Racugno

ISBN: 978-88-8467-874-4

ALTIERI L., COCCHI D., SCOTT E.M., VENTRUCCI M. (2012)

Assessing heterogeneity across Urban Morphological Zones from Corine land cover raster data

Proceedings of the VI International Workshop on Spatio-Temporal Modelling (METMA6).  
Guimares, Portugal, 12-14 September 2012

Editor: Goncalves, A.M., Sousa, I., Machado, L., Pereira, P., Menezes, R and Faria, S., eds,  
CMAT Centro de Matematica da Universidade do Minho: 1-4

ISBN: 978-989-97939-0-3

COCCHI D., VENTRUCCI M., ALTIERI L., SCOTT E.M. (2012)

Modelling urban sprawl patterns in binary raster maps

Proceedings of the 27th Int. Workshop on Statistical Modelling, Prague, July 16-20, 2012

Editor: Arnost Komarek and Stanislav Nagy vol. 1, pp. 441-446

ISBN: 978-80-263-0250-6

COCCHI D., ALTIERI L., SCOTT E.M., VENTRUCCI M., PEZZI G. (2011)

Statistical issues in the assessment of urban sprawl indices

Proceedings of Spatial2, Foggia and Baia delle Zagare, September 1-2, 2011, p. 1-4

In: Spatial Data Methods for Environmental and Ecological Processes - 2nd Edition

Editor: Cafarelli Barbara

ISBN: 978-88-96025-12-3

## Software

ALTIERI L., COCCHI D., ROLI G. (2018)

SpatEntropy: Spatial Entropy Measures. R package version 0.1.0.

<https://CRAN.R-project.org/package=SpatEntropy>

## PRESENTATIONS

### Oral presentations in conferences

*EPHASTAT Intermediate meeting*

September 6-7, 2018. Bari (Italy)

Invited session: Estimation of spatial entropy measures

*TIES-GRASPA Conference*

July 24-26, 2017. Bergamo (Italy)

Invited session: The use of spatial information in entropy measures

*Spatial statistics: one world, one health*

July 4-7, 2017. Lancaster (UK)

Contributed session: The use of spatial information in entropy measures

*Workshop Statistical models for environmental phenomena*

March 30-31, 2017. Bologna (Italy)

Invited session: The use of spatial information in entropy measures

*Int. Workshop on Statistical inference for assessing and monitoring natural resources*

November 10-11, 2016. Siena (Italy)

Contributed session: Using Bayesian P-splines for modelling spatial point process data

*GRASPA 2015*

June 15-16, 2015. Bari (Italy)

Invited session: Looking for changepoints in spatio-temporal earthquake data

*Spatial Statistics 2015*

June 10-12, 2015. Avignon (France)

Contributed session: The effect of gridding data when modelling spatial point patterns

*METMA VII - GRASPA 2014*

September 10-12, 2014. Torino (Italy)

Contributed session: A Bayesian changepoint analysis on spatio-temporal point processes, with application to radioactive particle data

*IBS conference*

July 5-11, 2014. Firenze (Italy)

Contributed session: A Bayesian changepoint analysis on spatio-temporal point processes

*SIS conference*

June 11-13, 2014. Cagliari (Italy)

Solicited session: A changepoint analysis on spatio-temporal point processes

## Poster presentations in conferences

*VI International Workshop on Spatio-Temporal Modelling (METMA6)*

September 12-14, 2012. Guimaraes (Portugal)

Poster: Urban sprawl scatterplots for analyzing Urban Morphological Zones raster data

*Spatial2 Conference*

September, 1-2, 2011. Foggia, Italy

Poster: Statistical issues in the assessment of urban sprawl indices

## Seminars

*Department of Methods and Models for Economy, Territory and Finance, La Sapienza University of Rome, IT*

February 15, 2018

Seminar: The use of spatial information in entropy measures

*Department of Statistical Sciences, University of Bologna, IT*

June 24, 2014; November 13, 2014; February 2, 2015

PhD project presentation: A changepoint analysis on spatio-temporal point processes

*CREEM, School of Mathematics and Statistics, University of St Andrews, UK*

April 11, 2014

Seminar: A Bayesian changepoint analysis on spatio-temporal point processes

*CREEM, School of Mathematics and Statistics, University of St Andrews, UK*

September 29, 2014

Seminar: A Bayesian changepoint analysis on spatio-temporal point processes, with application to radioactive particle data

## OTHER CONFERENCE ACTIVITIES

### Organization of conferences

*TIES-GRASPA Conference*

July 24-26, 2017. Bergamo (Italy)

Member of the organizing committee

*Workshop Statistical models for environmental phenomena*

March 30-31, 2017. Bologna (Italy)

Member of the organizing committee

### Co-authoring in conferences

*4th Workshop on Goodness-of-fit, Change-point and related problems*

September 6-8, 2019. Trento (Italy)

Co-authors: Daniela Cocchi (presenter)

Presentation: Spatial sampling and entropy and changepoint detection in urban development

*Italian Biometric Society regional meeting*

July 7-10, 2019. Naples (Italy)

Co-authors: Daniela Cocchi (presenter)

Presentation: Spatial sampling and entropy

*ITACOSM 2019 - 6th Italian Conference on Survey Methodology*

June 5-7, 2019. Florence (Italy)

Co-authors: Daniela Cocchi (presenter)

Presentation: Spatial sampling and entropy

*COMPSTAT 2018 - 23rd International Conference on Computational Statistics*

August 28-31, 2018. Iasi (Romania)

Co-authors: Fedele Greco (presenter), Carlo Trivisano

Presentation: The Mellin transform as a tool for prior elicitation in disease mapping

*Int. Workshop on Statistical inference for assessing and monitoring natural resources*

November 10-11, 2016. Siena (Italy)

Co-authors: Daniela Cocchi, Giulia Roli (presenter)

Presentation: The use of spatial information in entropy measures

*27th International Workshop on Statistical Modelling*

July 16-20, 2012. Prague (Czech Republic)

Co-authors: Massimo Ventrucci (presenter), Daniela Cocchi, E. Marian Scott

Presentation: Modelling urban sprawl patterns in binary raster maps

## Participation to conferences

*ITACOSM 2017: 5th ITALian CONference on Survey Methodology*  
June 14-16, 2017. University of Bologna, Italy

*Bayes 2013: Workshop on Bayesian Spatio-Temporal Modelling*  
October 8-9, 2012. Informatics Forum, Edinburgh, UK

## ADVANCED COURSES

*Workshop Spatial statistics 2017: An introduction to geostatistical analysis of spatio-temporal data with R*

Lancaster, UK, July 4, 2017

Instructors: Denis Allard, Liliane Bel, Thomas Opitz and Eric Parent

*Short course GRASPA 2015: An introduction to Flexible Regression for environmental data*  
Bari, Italy, June 17, 2015

Instructors: Adrian Bowman and Marnie McLean

*IYSM 2014 Tutorial: Bayesian Variable Selection: Past, Present and Future*  
Cagliari, Italy, June 14, 2014

Instructors: Ed George and Veronika Rockova

*INLA Tutorial: Bayesian computing and spatial modeling with the INLA-SPDE approach*  
Bergamo, Italy, October 28-29, 2013

Instructor: Daniel Simpson

*RSS Edinburgh: Bayesian computing with INLA*  
Edinburgh, UK, September 19, 2013

Instructors: Janine B. Illian and Andrew Lawson

*Statistical dependence: general issues and sequences of regressions*  
Florence, Italy, December 12-14, 2011

Instructors: David Cox and Nanny Wermuth

*INLA Tutorial: fast Bayesian inference for Geostatistics and other latent Gaussian models*  
Foggia, Italy, September 3, 2011

Instructor: Finn Lindgren

## AWARDS AND RECOGNITION

- Temporary research fellowship* 2018-2019  
Department of Statistical Sciences, University of Bologna
- Temporary research fellowship* 2016-2018  
Department of Statistical Sciences, University of Bologna
- Temporary research fellowship* 2014-2016  
Department of Statistical Sciences, University of Bologna
- Best Student Oral Presentation Award* 2014  
International Biometric Society  
Presentation: A Bayesian changepoint analysis on spatio-temporal point processes  
IBS conference, July 5-11, 2014, Firenze (Italy)
- PhD Scholarship* 2011-2014  
Department of Statistical Sciences, University of Bologna
- Fellowship Marco Polo Mobility Program* 2014  
Department of Statistical Sciences, University of Bologna  
Duration: 6 months  
Research project: PhD thesis  
Hosting structure: School of Mathematics and Statistics, University of Glasgow
- Fellowship Marco Polo Mobility Program* 2013  
Department of Statistical Sciences, University of Bologna  
Duration: 6 months  
Research project: PhD thesis  
Hosting structure: School of Mathematics and Statistics, University of Glasgow
- Scholarship* 2011  
Department of Statistical Sciences, University of Bologna  
Duration: 2 months  
Research project: MD thesis  
Hosting structure: School of Mathematics and Statistics, University of Glasgow

**AFFILIATIONS**

International Environmetrics Society (TIES)  
Italian Statistical Society (SIS)  
Research group for statistical applications to environmental problems (GRASPA)

**SCIENTIFIC ACTIVITIES FOR PEER-REVIEWED JOURNALS**

Reviewer for *Environmetrics* (Wiley) 2018

**INSTITUTIONAL ACTIVITIES**

*Temporary research fellows representative* 2018  
Department of Statistical Sciences, University of Bologna

Bologna, November 9, 2019

A handwritten signature in black ink, appearing to read "M. D'Addato".