Short Curriculum of

Angela Anna De Sanctis

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Academic position

Associate Professor in the SECS-S06 group (Mathematical methods for Economics and Actuarial and Financial Sciences) at the Department of Management and Business Administration of the "Gabriele d'Annunzio" University of Chieti-Pescara

Education

- Graduated with honors in Mathematics at the University of L'Aquila
- Scholarship from I.N.d.A.M. (National Institute for Advanced Studies in Mathematics) in Roma
- Scholarship from Ph.D. in Mathematics of the associated Universities of Roma I and Roma II
- Summer Schools "Dynamical Systems" (Cortona, Italy) and "Stochastic Differential Geometry and Applications in Finance" (Thermos, Grecia)

Teaching activities

- Contract from the Faculty of Political Science of L.U.I.S.S. University in Roma
- Lecturer, as Researcher, of the following courses: Mathematical Analysis I, Mathematical Analysis II, General Mathematics and Financial Mathematics (Faculty of Economics at the "G. d'Annunzio" University)
- Currently Lecturer, as Professor, of the following courses: Mathematics for Economics and Finance (First cycle, Economics and Management at the "G. d'Annunzio" University) and Quantitative methods for Finance (Second cycle, Economics and Management at the "G. d'Annunzio" University)
- Lecturer, as Professor, of the course of Mathematical Analysis (First cycle, Construction Engineering at the "G. d'Annunzio" University)

- Lecturer of the course "Mathematical methods for the economic and statistical analysis" at the "Economics and Statistics" Ph. D. of the "G. d'Annunzio" University
- Lecturer of the short course "Modeling commodity prices by stochastic differential equations" in the Socrates-Erasmus program at the University of Patras (Greece)
- Supervisor of many degree theses, including those of Doctors Domenico Di Spalatro, Pierpaolo Angelini e Annamaria Porreca.

Research fields

- Differential Geometry and Topology
- Information Geometry
- Shape Analysis
- Functional Data Analysis
- Complex Systems

Papers

- A. De Sanctis, G. Sorani "Coomologia di un campo vettoriale mai nullo" – Accademia nazionale dei Lincei, estratto dai Rendiconti della Classe di Scienze fisiche, matematiche, naturali, serie VIII vol. LXXI fasc. 6, December 1981

- A. De Sanctis "Perturbations of Geodesic Flows and Length of the Closed Geodesics"-Estratto dal Bollettino della Unione Matematica Italiana (7) I-B pag 1107-1128, Zanichelli Editore, 1987

- A. De Sanctis "Analisi di un modello stocastico per lo studio di fenomeni collettivi" Atti dell'XI Convegno A.M.A.S.E.S. Torino - Aosta 1987

- A. De Sanctis, G.Weinrich "Non Walrasian equilibria in a labour-managed economy"- Lecture notes in Economics and Mathematical Systems, Springer-Verlag, Vol. 399 pag. 139-175, 1991

- A. De Sanctis "Geodesic submanifolds of a family of statistical models" - Statistics and Probability Letters, 30 pag 127-132, 1996

- A. De Sanctis, D. Di Spalatro "Analisi intrinseca della disuguaglianza di Cramer-Rao", Atti del XXV Convegno Annuale A.M.A.S.E.S. Firenze 2001

- A. De Sanctis "La geometria delle famiglie di distribuzioni di probabilità esponenziali", Statistica, anno LXII, n. 2, 2002

- A. De Sanctis "Exact asymptotics on Zoll surfaces", International Mathematical Journal, Vol. 2, pag. 1119-1124, no. 11, 2002

- A. De Sanctis "Derivazione entropica di un modello generalizzato del prezzo di un'opzione di Black-Scholes" Atti del XXVII Convegno A.M.A.S.E.S. Cagliari 2003

- A. De Sanctis "Ergodicity in Science and Society with Application to Information Geometry" International Mathematical Forum vol. 1, no.5-8, 2006

- A. De Sanctis, C. Mari "An excitable stochastic model of electricity prices dynamics", Atti del XXX Convegno A.M.A.S.E.S. Trieste 2006

- A. De Sanctis "Lie Theory to valuing financial derivatives with time dependent parameters", International Mathematical Forum vol.2, no. 10, 2007

- A. De Sanctis, C. Mari "Modeling spikes in electricity markets using excitable dynamics", Physica A, vol.384, Issue 2, pag. 457-467, 2007

- A. De Sanctis, C. Mari "Modeling spikes in natural and social phenomena", Nonlinear Phenomena in Complex Systems, vol. 11, no.2, pag. 212-214, 2008

- T. Di Battista, S.A. Gattone and A. De Sanctis, "Dealing with FDA Estimation Methods", New Perspectives in Statistical Modeling in Data Analysis, Springer, New York, 2010

- A. De Sanctis "Information Geometry of a Regime-Switching Model with time-varying parameters", Nonlinear Phenomena in Complex Systems, vol. 13, no. 3, pp. 267-276, 2010

- A. De Sanctis Note Added to "Information Geometry of a Regime-Switching Model with time-varying parameters", Nonlinear Phenomena in Complex Systems, vol. 14, no. 1, pp. 102-105, 2011

- A. De Sanctis, T. Di Battista "Functional Analysis for Parametric Families of Functional Data", International Journal of Bifurcation and Chaos, vol. 22, no.9, 2012

- A. De Sanctis "Shape Analysis for Complex Systems using Information Geometry tools", Nonlinear Phenomena in Complex Systems, vol. 15, no. 1, pp. 70-73, 2012

- A. De Sanctis, C. Mari "Modellizzazione dei sistemi complessi: un'introduzione metodologica", Science & Philosophy, vol. 1, no. 1, pp. 29-36, 2013

- A. De Sanctis, F. Fortuna "Functional classification on convex function spaces", Proceedings S.I.S., 2014

- A. De Sanctis, S. A. Gattone "A study of Complex Shapes using Information Geometry", Nonlinear Phenomena in Complex Systems, vol. 18, no. 1, pp. 70-80, 2015

- A. De Sanctis, S. A. Gattone "Fisher Information Geometry for Shape Analysis", The 3rd International Electronic and Flipped Conference on Entropy and Applications (ECEA 2016), Sciforum Electronic Conference Series, vol. 3, 2016

- A. De Sanctis, S. A. Gattone "Methods of Information Geometry to model complex shapes", European Physical Journal-Special topics 225, pp.1271-1279, Springer-Verlag, 2016

- T. Di Battista, A. De Sanctis, F. Fortuna "Clustering Functional Data on Convex Function Spaces", Topics on Methodological and Applied Statistical Inference, Springer, 2016

- A. De Sanctis, S. A. Gattone "A new approach for modeling bone response to dental implant materials", Woodhead Publishing Series in Biomaterials Bone Response to Dental Implant Materials, Elsevier, 2017

- S. A. Gattone, A. De Sanctis, T. Russo, D. Pulcini "A shape distance based on the Fisher- Rao metric and its application for shapes clustering", Physica A, vol. 487, pag. 93-102, 2017

- A. De Sanctis, A. Porreca, F. Maturo "Complex systems in Economic and Social Science: an application of the Goodwin model to Italy using the statistical Software R", Systemic actions in complex scenarios, Cambridge Scholars Publishing, 2017

- A. De Sanctis, S. A. Gattone "A comparison between Wasserstein distance and a distance induced by Fisher-Rao metric in complex shapes clustering", Proceedings of the fourth International Electronic Conference "Entropy and Its Applications", 21 November–1 December 2017

- S. A. Gattone, A. A. De Sanctis "Statistics and Data Science: New Challenges, New Generations", Proceedings S.I.S., 2017

- S. A. Gattone, A. De Sanctis, S. Puechmorel, F. Nicol "On the geodesic distance in shapes K-means clustering", Entropy, special issue of the fourth International Electronic Conference "Entropy and Its Applications", 2018

- P. Angelini, A. De Sanctis "Subjective Probability and Geometry: Three metric theorems concerning random quantities", Journal of Mathematics research, vol.10, no.3, ISSN 1916-9795 E-ISSN 1916-9809 Published by Canadian Center of Science and Education, 2018

- P. Angelini, A. De Sanctis "On a geometric extension of the notion of exchangeability referring to random events", International Journal of Statistics and Probability, vol.7, no.2, ISSN 1927-7032 E-ISSN 1927-7040, Published by Canadian Center of Science and Education, 2018

A. De Sanctis (Guest Editor) "Nonlinear Phenomena in Complex Systems", special issue of the sixth Ph.D. Summer School/Conference "Mathematical Modeling of Complex Systems", 2020, vol. 23, no. 2, 2020:

- T. Bountis, A. De Sanctis, M. Robnik and J.J.P. Veerman "Preface"

- A. De Sanctis, S. A. Gattone "Information Geometry tools for Shape Analysis"
- F. D. Oikonomou, A. De Sanctis "Using the Alpha Geodesic distance in Shapes K-means Clustering"
- V. Perrotti, G. Iezzi, A. Piattelli, A. De Sanctis, A. Pasculli, G. Aprile "Correlation between bone density and fractal dimension: a pilot study"
- A. Pasculli, F. Rizzo, M. Mangifesta, A. Viskovic, A. De Sanctis, G. Iezzi, V. Perrotti, A. Piattelli, G. Aprile "Modeling of screw-dental structure interaction: first step toward Finite Element Analysis"

- A. A. De Sanctis, S. A. Gattone, F. D. Oikonomou "Alpha geodesic distances for clustering of shapes", Results in Applied Mathematics vol.18, 2023

- F. Minicucci, F. D. Oikonomou, A. A. De Sanctis "Fractal dimensional analysis for retinal vascularization images in retinitis pigmentosa: a pilot study", Chaos, Fractals and Complexity, Springer Proceedings in Complexity, 2023

- F. Minicucci, F. D. Oikonomou, A. A. De Sanctis "Multifractal Analysis of Choroidal SDOCT Images in the Detection of Retinitis Pigmentosa", Tomography,vol. 10, Issue 4, 2024

Teaching book

- A. De Sanctis "Elementi di matematica per le Scienze Applicate", Maggioli Editore, 2015

Research Projects and Scientific Associations

- Participant in the COFIN project (1999-2002) "Concepts of Stochastic Dependence in Economics" (Scientific Coordinator Prof. M. Scarsini)
- Participant in the COFIN project (2003-2004) "Alpha-Geometrie e loro connessioni per varietà statistiche classiche e quantistiche" (Scientific Coordinator Prof. G. Pistone)
- Participant in the PRIN project (2023-2025) "Normative and Digital Solutions to Counter Threats during National Election Campaigns – RightNet" (Scientific Coordinator Prof. Giovanni Di Cosimo)
- Member of A.M.A.S.E.S (Association for Mathematics applied to Social and Economic Sciences)
- Member of S.I.C.C. (Società Italiana per il Caos e la Complessità)
- Member of G.N.S.A.G.A. (Gruppo Nazionale per le Strutture Algebriche, Geometriche e loro Applicazioni) of the I.N.d.A.M.
- Coordinator of the Research Group "International Center for Nonlinear Dynamics and Complex Systems" (NODYCOSY) of the "G. d'Annunzio" University
- Member of the Center for Research and Application of Nonlinear Systems (CRANS) (Founded in 1996), Chief Prof. Tassos Bountis, Department of Mathematics, University of Patras, Greece
- Member of the International Research Group DOFIN (DOnnées Fonctionnelles et géométrie de l'INformation) (Founded in 2017), Chief Prof. Stéphane Puechmorel, Ecole Nationale de l'aviation Civile (ENAC), Université Fédérale de Toulouse, France
- Reviewer for many scientific journals among which: Entropy, Symmetry, Mathematics, Encyclopedia, Physica A.
- Member of the Editorial Committees for the journals: Ratio Mathematica and Nonlinear Dynamics in Complex Systems

Organization of International Conferences and scientific teaching activities

- Member of the local Organizing Committee for the International Conference "Information geometry and its applications", Pescara 01/05.07.2002

- "Contact person" and "staff member" in the Socrates-Erasmus Program with the Universities of Patras e Thessaly (Greece)
- Member of the Scientific and Organizing Committee for the International Conference "First Mediterranean Conference on Nonlinear Dynamics and its Applications", Pescara 03/08.07.2008
- Member of the Scientific and Organizing Committee for the International Conference "Nonlinear Science and Complexity", Pescara 28/31.07.2009
- Member of the Scientific and Organizing Committee for the International Conference MTISD 2010, Pescara 12/15.09.2010
- Member of the Scientific and Organizing Committee for the Summer Schools "Mathematical modeling of Complex Systems": Patras (Greece) 18/29.07.2011, Pescara (Italy) 16/28.07.2012, Patras (Greece) 20/30.07.2015 e Pescara (Italy) 03/11.07.2019
- Organizer of the Workshop on "Complex Systems" (Speakers Proff. Mirko Degli Esposti and Peter J. J. Veerman), Pescara, Italy, 06/06/2023

Speaker at Conferences

- 09/11-09-1987, XI Convegno A.M.A.S.E.S., Aosta

- 23/25-11-1987, Primo incontro demografico delle Regioni Adriatiche, Pescara

- 10/13-09-1990, XIV Convegno A.M.A.S.E.S., Pescara

- 27/30-05-1991, International Conference "Nonlinear dynamics in Economics and social sciences", Certosa di Pontignano, Siena

- 08/11-09-1993, XVII Convegno A.M.A.S.E.S., Ischia

- 07/09-05-2000, Convegno Nazionale "Matematiche Elementari da un punto di vista superiore: divulgazione e applicazioni", Pescara

- 06/09-09-2000, XXIV Convegno A.M.A.S.E.S., Padenghe sul Garda

- 05/08-09-2001, XXIV Convegno A.M.A.S.E.S., Firenze

- 01/05-07-2002, International Conference" Information geometry and its applications", Pescara

- 03/06-09-2003, XXVII Convegno A.M.A.S.E.S., Cagliari

- 14/26-07-2004, International Summer School-Conference "Complexity in Science and Society", Patras (Greece)

- 10/22-07-2006, XIX International Summer School-Conference "Nonlinear Science and Complexity", Thessaloniki (Greece)

- 04/07-09-2006, XXX Convegno A.M.A.S.E.S., Trieste

- 19/29-07-2007, XX International Summer School-Conference "Nonlinear Science and Complexity", Patras (Greece)

- 03/08-07-2008, First Mediterranean Conference on "Nonlinear Dynamics and its Applications", Pescara

- 21/31-07-2008, XXI International Summer School-Conference" Nonlinear Science and Complexity", Athens (Greece)

- 15/31-07-2009, XXII International Summer School-Conference "Nonlinear Science and Complexity", Patras and Pescara

- 12/16-07-2010, International Conference "Nonlinear Dynamics and Complexity", Thessaloniki (Greece)

- 12/15-09-2010, International Conference "Methods, Models and Information Technologies for Decision Support System" (MTISD), Pescara

- 18/29-07-2011, First Ph.D. School on "Mathematical Modeling of Complex Systems", Patras (Greece)

- 24/26-05-2012, Convegno Nazionale della Società italiana di scienze matematiche e fisiche (MATHESIS), Chieti

- 16/28-07-2012, Second Ph. D. School on "Mathematical Modeling of Complex Systems", Pescara

- 14/25-07-2014, 4th Ph. D. School on "Mathematical Modeling of Complex Systems", Athens (Greece)

- 18/30-07-2015, 5th Ph. D. School on "Mathematical Modeling of Complex Systems", Patras (Greece)

- 03/11-07-2019, 6th Ph. D. School on "Mathematical Modeling of Complex Systems", Pescara

- 24-09-2021, The European Night of Researchers at the "G. d'Annunzio" University, Seminar "The beauty in the Complex Systems", Chieti