

Current professional situation

Full professor of Game Theory, Faculty of Engineering, University of Genoa (Italy).

Background qualifications

Degree (MSc) in Mathematics, with honors, University of Genoa (Italy), 1974.

Academic career

CNR (National Research Council) fellowship, University of Genoa, 1974-77.

Assistant professor of Mathematical Analysis, University of Pavia, 1977-82.

Associate professor of Mathematical Analysis, University of Pavia, 1982-87.

Full professor of Mathematical Analysis, University of Udine, 1987.

Full professor of Mathematical Analysis, University of Genoa, 1987-95.

Full professor of Game Theory, University of Genoa, 1995- present

Fields of expertise

Applications of game theory to cost allocation problems, telecommunication, industrial organization, environmental issues and to genetics/biomedicine.

Axiomatic characterizations of solutions for optimization problems and for noncooperative games.

Cooperative games (TU and NTU).

Organization, funding, visiting, meetings

Organization :

Director of the CITG (Interuniversity Centre for Game Theory and Applications) for six years.

Promoter of the International Meetings "Game Practice", and organization of the first one: "Game Practice I" (Genoa, 1998).

Organization of the Summer Schools *Game Theory +*; (first edition 2002 on: "Game Theory and the Environment")

Member of the Scientific Council of "Econometrica".

Associate editor of "TOP", from 2001.

Associate editor of "Strategic Behavior and the Environment", from its creation.

Guest editor for proceedings of meetings (journals: *Annals of Operations Research*; *Mathematical Methods of Operations Research*; *International Game Theory Review*).

Funding:

"Water Quantity and Quality Allocations in the West Delta Region of Egypt" (WB funded project).

Team leader of two European Research Projects (TRIP and PARTNER) on railway transportation.

Scientific responsibility of various national research project, funded by the National Research Council or the Ministry of Research, and of a couple of joint projects
Scientific Responsibility of joint projects (Italy - Bulgaria and Italy – Spain).

Visiting:

I have visited for periods from one week to one month the following Universities/Institutions: Institute of Cybernetics (Kiev), Santiago de Compostela, Universitat de Barcelona, Elche, Nijmegen, Tilburg, University of Illinois at Urbana-Champaign, Northwestern University (Evanston, IL), Mathematical Institute of the Academy of Science (Sofia), The World Bank, CEEPA at the University of Pretoria.

Meetings:

I am regularly member of the Scientific Committee of meetings in Game Theory, since 1984 (initially Italian, now “SING”: Spain, Italy and The Netherlands).

Teaching

I have taught in the Universities of:

Genoa, Pavia, Udine, Trento, Politechnic of Milan, IUSS, Eastern Piedmont.

In the Faculties of:

Mathematical, Physical and Natural Sciences; Political Sciences; Economics; Engineering

Classes of:

Mathematical Analysis, Institutions of Mathematical Analysis, Institutions of Mathematics, Mathematical Method for Economic Analysis, Mathematical Economics, Game Theory, Decision Theory, Mathematical Models, Mathematics for Social Sciences, Mathematical Methods of Optimization, Financial Mathematics, Operations Research, Game Practice.

For the degrees of:

Engineering (Electronics, Management, Logistics and Transportation), Mathematics, Physics, Chemistry, Information Sciences, Political Sciences, Environmental Sciences, Economics.

I taught game theory courses for graduate students of the Universities of Genoa (in two different PhD programs; I a third one I taught a course on mathematical modeling), Trento, SISSA and for TELECOM-ParisTech (EDITE program).

I was responsible for the “Quantitative Methods” area and teacher in a series of eight Master courses, in the period from 1996/97 to 2003/04.

I have written various notes, including a booklet of Mathematical Analysis, a collection of notes for a Seminar in Mathematical Economics, and notes for a course on Mathematical Modeling. A huge number of teaching notes on various subjects is available on line, from my web page.

Video-recorded lessons of Game Theory courses that I have taught (in Italian and in English) are also available on the web.

I have been member of the e-learning commission of my University, in the years 2001 and 2002, and I have contributed to the creation the laboratory WAVE (Web Applications, Video & e-learning).

Organization of the course: "Environmental decisions: rationality, emotions and politics", 14-17 june 2004, in collaboration with FEEM, DIMA and DIPTERIS.

Realization, in collaboration with Prof. Garcia-Jurado (Santiago de Compostela, Spain) of a multilingual Game Theory course (46 hours) for the Tethys consortium: in English (video and text) and in Italian, French and Spanish (text).

Popularization, dissemination of scientific results

Member of the editorial board of "Lettera Matematica Pristem", and author of a series of notes on Game Theory (from issue 52, 2004).

Member of the organizing committee of the "Colloquium Mathematicum" at DIMA, for some years, from its creation.

Various talks for general audience (at the Science Festival of Genoa, at the Aquarium of Genoa, at the "Scuola Normale Superiore" in Pisa, and others mainly for high school students).

Talk on "The Mathematics of our Constitution", jointly with F. Contri, former Vice-President of the Italian Constitutional Court.

Main publications

[1] *On the Optimal Control for Variational Inequalities*, Journal of Optimization Theory and Applications, **22**, 373-388. 1977.

[2] *Sulla densità e genericità di alcuni problemi di minimo ben posti*", Bollettino dell'Unione Matematica Italiana, Serie V, **15-B**, 225-240. In collaboration with R. Lucchetti. 1978.

[3] *On Nemytskii's Operator and its Application to the Lower Semicontinuity of Integral Functionals*, Indiana University Mathematics Journal, **29**, 703-713. In collaboration with R. Lucchetti. 1980.

[4] *A Characterization of Tyhonov Well-Posedness for Minimum Problems, with Applications to Variational Inequalities*, Numerical Functional Analysis and Optimization, **3**, 461-476. In collaboration with R. Lucchetti. 1981.

- [5] *Hadamard and Tyhonov Well-Posedness of a Certain Class of Convex Functions*, Journal of Mathematical Analysis and Applications, **88**, 204-215. In collaboration with R. Lucchetti. 1982.
- [6] *Determinateness of Two-Person Games*, Bollettino dell'Unione Matematica Italiana, **5-B**, 907-924. In collaboration with R. Lucchetti and S. Tijs. 1986.
- [7] *Closure and upper semicontinuity results in mathematical programming, Nash and economic equilibria*, Optimization, **17**, 619-628. In collaboration with R. Lucchetti. 1986.
- [8] *Most Convex Functions are Nice*, Numerical Functional Analysis and Optimization, **9**, 359-369. 1987.
- [9] *Unified Approach to Approximate Solutions in Games and Multiobjective Programming*, Journal of Optimization Theory and Applications, **52**, 273-278. In collaboration with S. Tijs. 1987.
- [10] *Well-Posedness as an Ordinal Property*, Rivista di Matematica pura ed applicata, **1**, 95-104. 1987.
- [11] *Convergence and Approximation Results for Measurable Multifunctions*, Proceedings of the American Mathematical Society, **100**, 551-556. In collaboration with R. Lucchetti and N.S. Papageorgiou. 1987.
- [12] *Lambda-transfer and Harsanyi NTU-values: individual rationality, stability and degenerate solutions*, Cahiers du CERO, **33**, 103-121. In collaboration with R. Lucchetti, S. Tijs and A. Torre. 1991.
- [13] *Constrained minimum problems for preorders: Tikhonov and Hadamard well-posedness*, Bollettino dell'Unione Matematica Italiana, Serie VII, **5-B**, 639-652. In collaboration with J. Revalski. 1991.
- [14] *Well-Posedness for Nash Equilibria and Related Topics*, in *Recent Developments in Well-Posed Variational Problems* (editors: R. Lucchetti and J. Revalski), Kluwer, Dordrecht, 211-228. 1995.
- [15] *A New Approach to Tikhonov Well-Posedness for Nash Equilibria*, Optimization, **40**, 385-400. In collaboration with M. Margiocco and L. Pusillo. 1997.
- [16] *On Consistent Solutions for Strategic Games*, International Journal of Game Theory, **27**, 191-200. In collaboration with G. Pieri, S. Tijs and A. Torre. 1998.
- [17] *Metric characterizations of Tikhonov well posedness in value*, Journal of Optimization Theory and Applications, **100**, 377-388. In collaboration with M. Margiocco and L. Pusillo. 1999.
- [18] *Balanced Games arising from infinite linear models*, Mathematical Methods of Operations Research, **50**, No. 3. In collaboration with F. Fragnelli, E. Sideri and S. Tijs. 1999.
- [19] *Characterizing Properties of Approximate Solutions for Optimization Problems*, Mathematical Social Sciences, **40**, 297-311. In collaboration with H. Norde and S. Tijs. 2000.

- [20] *How to Share Railways Infrastructure Costs?*, in: "Game Practice: Contributions from Applied Game Theory" (editors: F. Patrone, I. García-Jurado, S. Tijs), Kluwer, Dordrecht. In collaboration with V. Fragnelli, I. García-Jurado, H. Norde and S. Tijs. 2000.
- [21] *Game Practice: Contributions from Applied Game Theory*, editor: Kluwer, Dordrecht. In collaboration with I. García-Jurado and S. Tijs. 2000.
- [22] *Unilateral Commitments and Finitely Repeated Games*, International Game Theory Review, **2** 129-139. In collaboration with I. García-Jurado and L. Mendez-Naya. 2000.
- [23] *Axiomatization for Approximate Solutions in Optimization*, in "Equilibrium Problems: Nonsmooth Optimization and Variational Inequality Models" (editors: M. Giannessi, G. Maugeri and P. Pardalos), Kluwer, Dordrecht. In collaboration with H. Norde and S. Tijs. 2001.
- [24] *Balancedness of Infrastructure Cost Games*, European Journal of Operational Research, **136**, 635-654. In collaboration with H. Norde, V. Fragnelli, I. García-Jurado and S. Tijs. 2002.
- [25] *A Potential Approach for Ordinal Games*, Top, **9**, 69-75. In collaboration with H. Norde. 2002.
- [26] *On Tikhonov well-posedness of concave games and Cournot oligopoly*, Journal of Optimization Theory and Applications, **112**, 361-379. In collaboration with M. Margiocco and L. Pusillo. 2002
- [27] *Cost Allocation Games with Information Costs*, Mathematical Methods of Operations Research, **59**(3), 419-434. In collaboration with S. Moretti. 2004.
- [28] *Designing and Implementing Electronic Auctions in a Multiagent System Environment*, WOA 2005: Dagli Oggetti agli Agenti. Flavio Corradini, Flavio De Paoli, Emanuela Merelli, Andrea Omicini (Eds.), 6th AI*IA/TABOO Joint Workshop "From Objects to Agents": Simulation and Formal Analysis of Complex Systems :157-163. In collaboration with D. Roggero and V. Mascardi. 2005.
- [29] *The Nucleolus Is Well-Posed*, Journal of Mathematical Analysis And Applications, **314**, 412-422. In collaboration with V. Fragnelli and A. Torre. 2006
- [30] *Application of Stochastic Cooperative Games in Water Resources*, in "Frontiers in Water Resource Economics" (editors: R. Goetz and D. Berga), Series: Natural Resource Management and Policy, Vol. 29, Kluwer Academic Publishers. In collaboration with A. Dinar, S. Moretti and S. Zara. 2006.
- [31] *Stackelberg problems: Subgame Perfect Equilibria via Tikhonov regularization*, in "Advances in Dynamic Games: Applications to Economics, Management Science, Engineering, and Environmental Management" (editos: A. Haurie, S. Muto, L.A. Petrosjan, and T.E.S. Raghavan), Birkhauser, Boston. In collaboration with J. Morgan. 2006.
- [32] *Individuazione dei parametri rilevanti per la definizione di una tariffa unificata per l'accesso all'infrastruttura ferroviaria in ambito europeo*, 2004 (presentato alla VII

- Riunione Scientifica della Società degli Economisti dei Trasporti, 2004); in "I trasporti e l'Europa" (Eds. G.Polidori, E.Musso, E.Marcucci) : 89-102, Franco Angeli, Milano (I). In collaboration with V. Fragnelli and S. Sanguineti. 2006.
- [33] *Cooperative Game Theory and its Application to Natural, Environmental, and Water Resource Issues: Basic Theory*. The World Bank, Policy Research Working Paper ; no. WPS 4072, 2006. In collaboration with I. Parrachino, and S. Zara. 2006.
- [34] *Cooperative Game Theory and its Application to Natural, Environmental, and Water Resource Issues: Application to Natural and Environmental Resources* by Stefano Zara, Ariel Dinar, and Fioravante Patrone. The World Bank, Policy Research Working Paper ; no. WPS 4073. In collaboration with S. Zara, and A. Dinar. 2006.
- [35] *Cooperative Game Theory and its Application to Natural, Environmental, and Water Resource Issues: Application to Water Resources*. The World Bank, Policy Research Working Paper ; no. WPS 4074. In collaboration with I. Parrachino, and A. Dinar. 2006.
- [36] *Water Allocation Strategies for the Kat Basin in South Africa: Comparing Negotiation Tools and Game Theory Models*. The World Bank, Policy Research Working Paper ; no. WPS 4083. In collaboration with A. Dinar, S. Farolfi, and K. Rowntree.. 2006.
- [37] *The class of Microarray games and the relevance index for genes*, Top, **15**, no. 2, 256-280. In collaboration with S. Moretti and S. Bonassi. 2007.
- [38] *Multicriteria Games and Potentials* , Top, **15**, no. 1, 138-145. In collaboration with Lucia Pusillo and Stef Tijs. 2007.
- [39] *An axiomatic approach to approximate solutions in vector optimization*, Decisions in Economics and Finance, to appear. Published on line. In collaboration with E. Miglierina, E. Molho and S. Tijs. 2008.
- [40] *Share Opportunity Sets and Cooperative Games*, to appear in International Game Theory Review. In collaboration with E. Caprari, L. Pusillo, S. Tijs, A. Torre. 2008.
- [41] *To negotiate or to game theorize: negotiation vs. game theory outcomes for water allocation problems in the Kat Basin, South Africa*. In: "Game Theory and Policy Making in Natural Resources and the Environment" (editors: A. Dinar, J. Albiac, and J. Sánchez-Soriano), Routledge. In collaboration with A. Dinar, S. Farolfi, and K. Rowntree. 2008.
- [42] *Transversality of the Shapley value*, TOP, **16**, 1-41. Invited paper. Rejoinder: *ibidem*, pp. 60-61. In collaboration with S. Moretti. 2008.
- [43] *Incentive compatibility in kidney exchange problems*, to appear in Health Care Management Science . In collaboration with S. Villa. 2008.
- [44] *Combining Shapley value and statistics to the analysis of gene expression data in children exposed to air pollution*, BMC Bioinformatics, **9**, 361. In collaboration with: S. Moretti, D. van Leeuwen, H. Gmuender, S. Bonassi, J. van Delft, J. Kleinjans, D. F. Merlo. 2008.

- [45] *A virtual enterprise multi-agent model to support VDO decision making*. To appear on the proceedings of the 9th MITIP (The Modern Information Technology in the Innovation Processes of the Industrial Enterprises). In collaboration with A. Grosso, R. Revetria, F. Tonelli. 2007.
- [46] *ClubMED: Coordinated Multiple Exit Discriminator Strategies for Peering Carriers*, submitted. In collaboration with S. Secci, J.-L.s Rougier, A. Pattavina, G. Maier. 2008
- [47] *Organ donation: an exercise on organizing self-regarding behavior?* Submitted. In collaboration with S. Villa. 2008
- [48] *Essentializing Equilibrium Concepts*, submitted. In collaboration with J. González-Díaz, F. Briata, and I. García-Jurado. 2008.
- [49] *Foreword to Policy and strategic behavior in water resource management*, A. Dinar and J. Albiac editors, Earthscan, 2008.
- [50] *The Shapley and Banzhaf indices in microarray games*, submitted. In collaboration with R. Lucchetti, S. Moretti, P. Radrizzani, 2008
- [51] *A Game Theoretical Non-Cooperative Framework for Internet Extended Peering*, submitted. In collaboration with S. Secci, J.-L. Rougier, A. Pattavina, G. Maier

Books:

- Decisori (razionali) interagenti: Una introduzione alla teoria dei giochi*. Edizioni plus, Pisa, 2006.
- Modelli e strumenti innovativi per la gestione di network di imprese*, Edizioni Anteo, Perugia. In collaboration with: P. Lunghi, F. Tonelli, R. Rinaldi, P. Taticchi, M. Botarelli, L. Cagnazzo, R. Bandinelli, L. Cellesi, A. Grosso, M. Brillì, M. Ginocchietti. 2008.