

Curriculum vitae

Paolo Vitolo

English version

- Born in Parma on November 17, 1963.
- Degree in Mathematics at the University of Parma obtained on July 18th, 1986 with grades 110/110 cum laude.
- PhD in Mathematics at the University of Milan under the supervision of Prof. Sandro Levi. PhD degree obtained after the final examination passed on July 3rd, 1991.
- INdAM post-doctorate scholarship at the University of Milan from November 1st, 1991 to May 15th, 1992.
- Assistant Professor in Mathematical Analysis at the Faculty of Sciences of the University of Basilicata from May 16th, 1992 to December 29th, 2004.
- Member of the teaching staff of the PhD scholarship in Mathematical Methods and Models for Dynamical Systems at the University of Basilicata, until the academic year 2010–2011.
- Since the academic year 2011–2012, member of the teaching staff of the International Doctoral Seminar “Pythagoras of Samos” at the University of Basilicata, where at present I am advisor of a student.
- Author of 35 articles published in international journals, which have collectively received more than 30 citations from other authors.
- I have held 12 communications in international conferences and an invited conference at the Academy of Sciences of Slovakia.

Current position

Associate Professor in Mathematical Analysis at the Department of Mathematics, Computer Science and Economics of the University of Basilicata.

University teaching

Mathematical Analysis I, Degree in Mathematics: Academic year 1997–’98 and from 2001–’02 to present day.

Higher Analysis, Master of Science in Mathematics: Academic years 2009–’10 and 2010–’11.

Topological Methods for Analysis, Master of Science in Mathematics: Academic year 2011– ’12.

Main research interests

Measure Theory, General Topology.

Some information about the research

From PhD, I started to deal with problems related to topologies defined on the hyperspace, i.e. the collection of closed subsets of a topological (or metric) space. This field of research, that originated in the early decades of the twentieth century, has received new impetus in the years 1950–1960 thanks also to the work of E. Michael and J. M. G. Fell.

The interest in research in this field has grown recently, motivated primarily by applications to both the theory of multifunctions (with effects also on the Mathematical Economics: see for example the book by E. Klein and A. C. Thompson, “Theory of Correspondences”, Wiley 1984) and minimization problems especially in Convex Analysis (see in this respect the book by G. Beer “Topologies on Closed and Closed Convex Sets”, Kluwer, 1993).

In this area I have addressed and resolved, in collaboration with Camillo Costantini since 1995, and since 2004 also with Lubica Holá, some problems including the characterization of the infimum of the Hausdorff metric topologies on a metrizable space, and the determination of cardinal invariants of certain topologies, such as the Fell topology.

Later I devoted to the study of measures on non-Boolean structures such as orthomodular lattices and, more generally, effect algebras and pseudo-effect algebras. This research originated from the work of G. Birkhoff and J. von Neumann. In recent years M. K. Bennett and D. J. Foulis introduced effect algebras in order to build models for quantum logic, but these structures are also present in mathematical models of decision theory in economics.

Currently, research in this field is developed mainly by members of the International Quantum Structures Association, which brings together scientists from around the world.

In this context, for modular measures defined on effect algebras and taking values in topological Abelian groups, I obtained, mainly in collaboration with Anna Avallone, extension theorems, decomposition theorems, control theorems, Lyapunov type theorems, and several others.

Among the results achieved, for example, are the following:

In the paper “Congruences and ideals of effect algebras”, *Order*, Vol 20, 2003, pp. 67–77, in collaboration with Anna Avallone, it is resolved an open problem of the effect algebras theory that concerns the characterization of Riesz ideals by means of Sasaki projections.

In the paper “On a result of Aumann and Shapley about values of nonatomic games”, *Journal of Mathematical Analysis and Applications*, Vol 344, 2008, pp. 484–490 (DOI 10.1016/j.jmaa.2008.02.066), in collaboration with Camillo Costantini, it is detected and corrected an error in the proof of a famous result by A. J. Aumann (Nobel Laureate in Economics, 2005) and L. S. Shapley on game theory, published in the book “Values of Non-Atomic Games”, Princeton University Press, 1974.

The above result of Aumann and Shapley is then generalized in the paper “On the Aumann-Shapley value”, *Positivity*, Vol 12, 2008, pp. 613-629 (DOI 10.1007/s11117-008-2207-x), in collaboration with Achille Basile and Camillo Costantini.

List of Publications

[1] Paolo Vitolo, “Characterizations of simply disconnected complete digraphs”, *Atti IV Convegno di Topologia, Supplemento ai Rendiconti del Circolo Matematico di Palermo, serie II*, n. 24, 1990, p. 449–505.

[2] Paolo Vitolo, “Scott topology and Kuratowski convergence on the closed subsets of a topological space”, *Atti V Convegno di Topologia, Supplemento ai Rendiconti del Circolo Matematico di Palermo, serie II*, n. 29, 1992, p. 593–603.

[3] Camillo Costantini, Paolo Vitolo, “On the infimum of the Hausdorff metric topologies”, *Proceedings of the London Mathematical Society (3)* 70, 1995, p. 441–480.

[4] Paolo Vitolo, “A representation theorem for quasi-metric spaces”, *Topology and its Applications*, Vol. 65, 1995, p. 101–104.

[5] Paolo Vitolo, “When is Kuratowski convergence topological?”, *Filomat (Nis̄)*, Vol. 12, n. 1, 1998, p. 83–101.

[6] Paolo Vitolo, “The reconstruction of simply disconnected tournaments”, *Journal of Combinatorics, Information & System Sciences*, Vol. 24, 1999, p. 65–77.

[7] Camillo Costantini, Paolo Vitolo, “Decomposition of topologies on lattices and hyperspaces”, *Dissertationes Mathematicae*, Vol. CCCLXXXI, 1999.

[8] Camillo Costantini, Paolo Vitolo, “Uniform properties and hyperspaces of metrizable spaces”, *Journal of Applied Analysis*, Vol. 5, n. 2, 1999, p. 187–196.

[9] Paolo Vitolo, “The representation of weighted quasi-metric spaces”, *Rendiconti dell’Istituto di Matematica dell’Università di Trieste*, Vol. XXXI, 1999, p. 95–100.

[10] Domenico Senato, Paolo Vitolo, “The complete uniform ring of formal polynomials”, *Far East Journal of Mathematical Sciences*, Vol. 3, n. 1, 2001, p. 97–119.

[11] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, “Hahn decomposition of modular measures and applications”, *Annales Societatis Mathematica Polonae, Ser. I: Commentationes Mathematicae*, Vol. XLIII (2), 2003, p. 149–168.

[12] Anna Avallone, Paolo Vitolo, “Decomposition and control theorems in effect algebras”, *Scientiae Mathematicae Japonicae*, Vol. 58, n. 1, 2003, p. 1–14 (:e8, 1–14).

[13] Anna Avallone, Paolo Vitolo, “Congruences and ideals of effect algebras”, *Order*, Vol. 20, 2003, p. 67–77.

- [14] Camillo Costantini, L'ubica Holá, Paolo Vitolo, "Tightness, character and related properties of hyperspace topologies", *Topology and its Applications*, Vol. 142, 2004, p. 245–292.
- [15] Anna Avallone, Paolo Vitolo, "Lattice uniformities on effect algebras", *International Journal of Theoretical Physics*, Vol. 44(7), 2005, p. 793–806.
- [16] Anna Avallone, Achille Basile, Paolo Vitolo, "Positive operators à la Aumann–Shapley on spaces of functions on D-lattices", *Positivity*, Vol. 10, 2006, p. 701–719.
- [17] Anna Avallone, Anna De Simone, Paolo Vitolo, "Effect algebras and extensions of measures", *Bollettino dell'Unione Matematica Italiana, B*, Vol. 9(2), 2006, p. 423–444.
- [18] Anna Avallone, Silvana Rinauro, Paolo Vitolo, "Boundedness and convergence theorems in effect algebras", *Tatra Mountains Mathematical Publications*, Vol. 37, 2007, p. 1–16.
- [19] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, "On the Alexandroff decomposition theorem", *Mathematica Slovaca*, Vol. 58, n. 2, 2008, p. 185–200.
- [20] Anna Avallone, Paolo Vitolo, "Effect algebras with the Subsequential Interpolation Property", *Soft Computing*, Vol. 12, n. 6, 2008, p. 559–565 (DOI 10.1007/s00500-007-0228-1).
- [21] Camillo Costantini, Paolo Vitolo, "On a result of Aumann and Shapley about values of non-atomic games", *Journal of Mathematical Analysis and Applications*, Vol. 344, 2008, p. 484–490 (DOI 10.1016/j.jmaa.2008.02.066).
- [22] Ji-Cheng Hou, Paolo Vitolo, "Fell topology on the hyperspace of a non-Hausdorff space", *Ricerche di Matematica*, Vol. 57, 2008, p. 111–125 (DOI 10.1007/s11587-008-0032-y).
- [23] Achille Basile, Camillo Costantini, Paolo Vitolo, "On the Aumann–Shapley value", *Positivity*, Vol. 12, 2008, p. 613–629 (DOI 10.1007/s11117-008-2207-x).
- [24] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, Hans Weber, "Decomposition of effect algebras and the Hammer–Sobczyk theorem", *Algebra Universalis*, Vol. 60, 2009, p. 1–18 (DOI 10.1007/s00012-008-2083-z).
- [25] Anna Avallone, Paolo Vitolo, "Lyapunov decomposition of measures on effect algebras", *Scientiae Mathematicae Japonicae*, Vol. 69, n. 1, 2009, p. 79–87 (:e8, 1–14).
- [26] Paolo Vitolo, "A question about basic algebras", *Algebra Universalis*, Vol. 62, n. 4, 2010, p. 345–350 (DOI 10.1007/s00012-010-0033-z).
- [27] Paolo Vitolo, "Compatibility and central elements in pseudo-effect algebras", *Kybernetika*, Vol. 46, n. 6, 2010, p. 996–1008.
- [28] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, "Central elements in pseudo-D-lattices and Hahn decomposition theorem", *Bollettino dell'Unione Matematica Italiana (9)*, Vol. 3, n. 3, 2010, p. 447–470.

- [29] Paolo Vitolo, “A generalization of set-difference”, *Mathematica Slovaca*, Vol. 61, n. 6, 2011, p. 835–850 (DOI 10.2478/s12175-011-0051-0).
- [30] Anna Avallone, Paolo Vitolo, “Pseudo-D-lattices and topologies generated by measures”, *Italian Journal of Pure and Applied Mathematics*, Vol. 29, 2012, p. 25–42.
- [31] Anna Avallone, Paolo Vitolo, “Lattice uniformities on pseudo-D-lattices”, *Mathematica Slovaca*, Vol. 62, n. 1, 2012, p. 1–26.
- [32] Anna Avallone, Paolo Vitolo, “Lebesgue decomposition and Bartle–Dunford–Schwartz theorem in pseudo-D-lattices”, *Acta Mathematica Scientia*, Vol. 33 B, 2013, p. 1–25.
- [33] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, “Pseudo-D-lattices and Lyapunov measures”, *Rendiconti del Circolo Matematico di Palermo*, Vol. 62, 2013, p. 301–314.
- [34] Anna Avallone, Giuseppina Barbieri, Paolo Vitolo, Hans Weber, “Openness of measures and closedness of their range”, *Journal of Mathematical Analysis and Applications*, Vol. 404, 2013, p. 57–63.
- [35] Marco Rosa, Paolo Vitolo, “A question related to the Isbell Problem”, *Topology and its Applications*, Vol. 160, 2013, p. 1829–1848.