

# Curriculum Vitae – Paolo Toth



Born on December 29, 1941 in Zara (Italy). Married, 3 children, 7 grand-children.

## Current Position

- **Professor Emeritus** of “Combinatorial Optimization” (Operational Research area, SSD MAT/09) at DEI (Dipartimento di Ingegneria dell’Energia Elettrica e dell’Informazione “Guglielmo Marconi”), Alma Mater Studiorum University of Bologna, A.D. 1088, Italy.

## Contacts & Web Links

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## Advisor/Supervisor (University of Bologna)

More than 200 Master theses. 25 PhD students (from 6 different countries), 16 PostDocs.

## Previous Positions

- “**Alma Mater Professor**”, DEI, University of Bologna (2012-2014).
- **Full Professor** of “Combinatorial Optimization” (Operational Research area, SSD MAT/09) at DEIS (Dipartimento di Elettronica, Informatica e Sistemistica), Faculty of Engineering, University of Bologna (1983-2012).

- **Full Professor** of “Automatic Control” (SSD ING-INF/04), Faculty of Engineering, University of Florence (1980-1983).
- **Lecturer** of “Computer Science”, Faculty of Engineering, University of Bologna (1972-1980).
- **Assistant Professor** of “Computer Science”, Faculty of Engineering, University of Bologna (1968-1972).
- **Visiting Professor** of “Routing and Scheduling Problems” at the Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, USA (August-October 1987).
- **“Extraordinary Professor”** at the Department of Logistics, University of Stellenbosch, South Africa (2009-2012).
- **“Visiting Professor”** at the Department of Industrial Engineering of the University of Stellenbosch, South Africa (from February 2015).

## Education

**Master in Electronic Engineering** from the University of Bologna in the academic year 1964-65.

## Organizational Activity

### *Conferences and Schools:*

- Co-Organizer of the “*Summer School in Combinatorial Optimization*” (Urbino, Italy, June 1977);
- Co-Chair of the Program Committee of the Conference “*Giornate AIRO 1979*” (Annual Conference of *AIRO, the Italian Operational Research Society*, Urbino, Italy, September 1979);
- Chair of the Organizing Committee of EURO VII (Seventh European Conference of *EURO, the European Association of the Operational Research Societies*, Bologna, Italy, June 1985);
- Chair of the Program Committee of the Conference TRISTAN II (Triennial Symposium on Transportation Analysis, Capri, Italy, June 1994);
- Chair of the Scientific Committee of the EURO Summer Institute on Locational Analysis (Tenerife, Spain, June 1995);
- Chair of the Program Committee of IFORS'99 (the Triennial Conference of *IFORS, the International Federation of the Operational Research Societies*, Beijing, August 1999);
- Co-Chair of the Program Committee of ROUTE 2005 (Third International Workshop on Vehicle Routing and Intermodal Transportation, Bertinoro, Italy, June 2005);

- Co-Chair of the Program Committee of the Conference “Giornate AIRO 2006”, Cesena, Italy, September 2006);
- Co-Chair of the Program Committee of the Conference *CPAIOR 2010* (7th International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems, Bologna, June 2010);
- Co-Chair of the Program Committee of the Conference "*VeRoLog 2012*" (First Meeting of the EURO Working Group in Vehicle Routing and Logistics Optimization, Bologna, June 2012);
- Chair of the Program Committee of the EURO/ALIO Joint Conference on Applied Combinatorial Optimization (Bologna, June 2018).

*Member of International Juries:*

- Member of the Jury of the *Lanchester Prize* of ORSA (*Operations Research Society of America, currently INFORMS*) in the year 1988;
- Member of the Jury of the *Dissertation Prize in Transportation Science* of INFORMS in the years 1991, 1998 and 1999; Chair of the Jury in the year 2000;
- Chair of the *EURO Gold Medal Jury* in the year 2001;
- Chair of the Jury of the *TSL (Transportation Science and Logistics) Best Paper Award* of INFORMS in the year 2006;
- Chair of the first EURO Distinguished Service Medal Jury in the year 2009.

*Scientific Societies Managerial Functions:*

- Member of the Executive Committee of AIRO in the years 1979-1986;
- Secretary of EURO in the years 1986-1990,
- President of AIRO in the years 1988-1995;
- President of EURO in the years 1995-1996;.
- President of IFORS in the years 2001-2003.

*Academic Managerial Functions:*

- Director of the Computer Center of the Faculty of Engineering of the University of Bologna in the years 1983-1987;
- Coordinator of the Master Degree in Electronic Engineering of the University of Bologna in the years 1989-1992;
- Coordinator of the Master Degree in Computer Engineering of the University of Bologna in the years 1998-2001;
- Vice-Director of DEIS (Department of Electronics, Computer Science and Automatic Control), in the years 2000-2009;
- Director of the PhD School in *Information Sciences and Engineering* (with about 150 PhD students) of the University of Bologna in the years 2005-2008;

- Coordinator of the PhD Course in *Automatica e Ricerca Operativa* (Automatic Control and Operational Research) of the University of Bologna in the years 2010-2011;
- Elected member of the Academic Senate of the University of Bologna in the year 2011.
- Chairman of the Board of Directors of the healthcare IT company NOEMALIFE SpA (Bologna, with over 400 employees) from its foundation (1996) to 2012.

### **Editorial and Referee Activities**

- **Editor in Chief** of the journal *Ricerca Operativa* (journal of AIRO, the Italian Operational Research Society) in the years 1982-1988;
- **Area Editor** for *Transportation* of the journal *Operations Research* for the years 2000-2002.
- **Member of the Editorial Boards** of the journals: *European Journal of Operational Research*, *Journal of Heuristics*, *Networks*, *Journal of the Operational Research Society*, *Discrete Optimization*, *Discrete Applied Mathematics*, *International Transactions in Operational Research*, *EURO Journal on Transportation and Logistics*, *Journal of Operations and Logistics*, *Public Transport*, *ORiON*, *RAIRO*.
- **Referee** (ca. 25 papers/year) for over 25 journals, including: *Mathematical Programming*, *Operations Research*, *Management Science*, *European Journal of Operational Research*, *Journal of Heuristics*, *Networks*, *Omega*, *Journal of the Operational Research Society*, *Discrete Optimization*, *Transportation Science*, *INFORMS Journal on Computing*, *Discrete Applied Mathematics*, *International Transactions in Operational Research*, *EURO Journal on Transportation and Logistics*, *Computers & Operations Research*, *Public Transport*, *Transportation Research Part B*, *RAIRO*, *ORiON*.
- **Grant Reviewer for:** *MIUR* (Italian Ministry for Education and Research), *NSERC* (Natural Sciences and Engineering Research Council of Canada), *FNRS* (National Funds for Scientific Research, Belgium), *Fondecyt* (Chilean National Science and Technology Council), National Research Councils of Austria, The Netherlands, United Kingdom.

## Research Activities

- His current main research interests include Operational Research and Mathematical Programming methodologies and, in particular, the definition of mathematical models and the design and implementation of effective exact and heuristic algorithms for Combinatorial Optimization and Graph Theory problems, and their application to real-world Transportation, Logistics, Loading, Routing, Crew Management, Railway Optimization problems.
- He is author of more than 200 papers published in international journals and of the book "*Knapsack Problems: Algorithms and Computer Implementations*" (coauthor S. Martello; J. Wiley, Chichester, 1990). He is also Editor of the books "*Combinatorial Optimization*" (coeditors N. Christofides, A.Mingozzi, C. Sandi; J. Wiley, Chichester, 1979), "*FORTTRAN Codes for Network Optimization*" (coeditors B. Simeone, G. Gallo, F. Maffioli, S. Pallottino; Annals of Operations Research, 1988), "*Advanced Methods in Transportation Analysis*" (co-editor L. Bianco; Springer, Berlin, 1996), "*The Vehicle Routing Problem*" (coeditor D. Vigo, SIAM Monographs on Discrete Mathematics and Applications, Philadelphia, 2002), "*Vehicle Routing: Problems, Methods, and Applications*" (coeditor D. Vigo, MOS-SIAM Series on Optimization, Philadelphia, 2014).

## Bibliometrics (*Google Scholar, November 2022*)

**Publications** (international peer-reviewed journals) Total > **200**

**Citations:** Total > **38,000**

**H-index** = **91** (the highest h-index among the Italian researchers in the fields of Pure and Applied Mathematics and Operational Research).

## National and International Grants

- From 2004 to 2006 he was in charge of the Bologna University Unit of the European Union Project PARTNER (Path Allocation Reengineering of Timetable Networks for European Railways).
- From 2005 to 2007 he was in charge of the Bologna University Unit of the European Union Project REORIENT (Implementing Change in the European Railway System).
- From 2005 to 2008 he was in charge of the Bologna University Unit of the European Union Project ALFA "Solution of Large Scale Real-World Combinatorial Optimization Problems".

- From 2006 to 2009 he was in charge of the Bologna University Unit of the European Union Project ARRIVAL (Algorithms for Robust and online Railway optimization: Improving the Validity and reliability of Large scale systems).
- From 2011 to 2014 he was in charge of the Bologna University Unit of the European Union Project ON TIME (Optimal Networks for Train Integration Management across Europe).
- He was National Coordinator of the PRIN (“Research Projects of National Interest”) Projects “Routing and Packing Problems in the Optimization of Transportation Systems” (PRIN 2005) and “Models and Algorithms for Combinatorial Optimization Problems in the Management of Transportation Systems” (PRIN 2008).
- He was also in charge of the University of Bologna unit of several NATO and CNR research projects, and of industrial contracts (Ferrovie dello Stato, Rete Ferroviaria Italiana, Noemalife, Telesistemi Ferroviari, Mortara-Rangoni, Trenitalia, BiEsse, MAIOR, ...).

## Awards

- At the INFORMS-CORS Meeting of Montreal, April 1998, he delivered the "**Harold Larnder Memorial Lecture**" (annual Award of CORS, the Canadian Operational Research Society, for his "Distinguished International Achievement in Operational Research").
- In July 1998, he was conferred the "**EURO Gold Medal**", the highest distinction within Operational Research in Europe, “for a Remarkable Role Played in the Promotion of OR and for an Outstanding Contribution to the OR Science”.
- In May 2003, the **University of Montreal** conferred him a "**Doctorate honoris causa**" in Operational Research.
- In November 2005, the Transportation Science and Logistics Society of INFORMS conferred him the "**Robert Herman Lifetime Achievement Award in Transportation Science**" for "the fundamental and sustained contributions to transportation science and logistics, and the influence on the field through writings, teaching, service, and nurturing of younger professional researchers".
- In September 2006, AIRO awarded him the "**AIRO Fellowship**" for his contributions to the development of Operational Research in Italy.
- In September 2012, VeRoLog (the EURO Working Group in Vehicle Routing and Logistics) awarded him the "**VeRoLog Fellowship**" for his contributions to the development of models and algorithms for the solution of Vehicle Routing problems.
- In October 2012, at the INFORMS Annual Meeting in Phoenix (AZ), he delivered the “**IFORS Distinguished Plenary Lecture**”.

- In November 2016, INFORMS awarded him the "**INFORMS Fellowship**", "in recognition of outstanding contributions, achievements, and service that have advanced the profession of operations research and the management science".
- In June 2019, EURO awarded him the "**EURO Distinguished Service Award**", for his contribution to the development of Operational Research in Europe.
- From September 2019 he is **Member of the Academy of Science of Bologna** (founded in the year 1690).
- In the year 2020, IFORS awarded him the "**IFORS Fellowship**".