Guido Perboli

PERSONAL DATA

Family name	Perboli
Name	Guido
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EDUCATION

2002	Ph.D. in Computer Engineering - Politecnico di Torino, Torino (Italy) - Cosupervised by the CIRRELT (formerly CRT) Center, Montreal, Canada
1999	Master degree in Computer Engineering - Politecnico di Torino, Torino (Italy)

LANGUAGES

Italian	Mother tongue

SHORT BIO

Guido Perboli is Full Professor in the Department of Management and Production Engineering (DIGEP) of Politecnico di Torino and Associate Member of the CIRRELT - Centre Interuniversitaire de Recherche sur les Réseaux d'Enterprise, la Logistique et les Transport - Québec, Canada. He is presently in charge of the courses of Strategic Management and Operations Research in the Industrial Production and Innovation Management Master degree.

In 2016 he founded the ICT for City Logistics and Enterprises (ICELab@Polito) center of Politecnico di Torino, a research center focused on two of the main activities supporting the urban growth: logistics and enterprises. He is presently the director of the ICE center. He is the author of more than 100 papers on peer reviews in International journals and Conferences (see `http://staff.polito.it/guido.perboli/` for the detailed list). His main areas of expertise are Business development and Lean Business, City Logistics and Smart City, Green logistics and impact assessment of externalities reduction policies in Supply Chains, Urban Freight delivery, Container and Vehicle Packing, Fleet Routing and Management.

Mentor of Startups and with an experience of 15 years in Business Development and R&D, he is currently a shareholder and Chief Scientific Officer of Arisk (`https://www.arisk.it/`), a Deeptech Startup operating in the Enterprise Crisis sector and Spinoff of Politecnico di Torino. With AI and Machine Learning, Arisk algorithms can predict with a precision of more than 85% a business interruption up to 60 months in advance by considering financial, organizational, ESG, and operational risks. For its innovative methods, in 2019 Arisk was awarded by Credit Village as the best Startup

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in the Credit Industry and by the Italian Fintech and Insurtech Observatory one of the best 10 Startups in the market.

He is also a member of scientific boards and awards, including the Scientific Board of SOS Log (`http://www.sos-logistica.org/en`), the main Italian association of Sustainable Logistics, the Digital Hub of Compagnia delle Opere, an association of enterprises with more than 30000 companies, and the Amazon Innovation Award, the international award of Amazon on Service Innovation, Last Mile Delivery, and Warehouse Management. Since 2010 he has also been advisor of several Italian regions for innovation projects, advisor of the National Grants of the Government of Canada, as well as a member of the Board for Logistics of the Regional Council of Piedmont, the bilateral policy table on Logistics and Supply Chain Politecnico di Torino-CONFINDUSTRIA and member of the think tank of EbiLog and Fright Leaders Council on Logistics.

Since 1998 he is a consultant for National and International companies, including Accenture, DHL, Emerson Network Power, FCA, Iveco, Panalpina, Porche, Rhona, Telecom Italia, Tales Alenia Spazio, TNT, and mentor in TIM Ventures and I3P of Startups.

───── MAIN RESEARCH TOPICS

Business models and Lean Business

The issue of controlling and evaluating the decision-making processes in Multi-Actor complex Systems (MACSs) is a well-known challenge in the literature. The issue becomes more and more interesting when the actors are characterized by different backgrounds, introducing behavioural aspects to the complexity due to the inter-correlation between the actors themselves. In order to cope with this issue, my research goes toward the integration between the business processes and models with the operational ones by Lean startup tools. This led to the definition of GUEST, a Lean Business methodology able to cope from the early definition of the idea up to the factual implementation while reducing the time-to-market and increasing the co-creation level of the people involved in the innovation process. The methodology was used in different environments, including more than 50 companies from different sectors as food and beverage (Lavazza), automotive (FCA, IVECO, Italdesign), public companies (CIDIU), energy (Emerson Power), Parcel delivery (TNT, DHL, PonyZero) and European Projects.

Smart and Sustainable Cities

The research focused on the integration of optimization procedures in the supply chain of freight transportation in urban areas, and on Last Mile Logistics in particular. This is a major challenge, due to the peculiarities of Last Mile Logistics and the fact that different aspects (economical, environmental, social, behavioural) must be taken into account. Thanks to the collaboration with large companies (DHL, TNT, Amazon), startups and public bodies, the research considered both operational issues, as well as the development of new business services and models and their integration with the operational issues. Moreover, from an industrial point of view, prof. Perboli has been involved in the creation of the first certification program for sustainable logistics (in collaboration with Lloyd's Register and SOSLog, the Italian Society for Sustainable Logistics)

Operations management and Combinatorial Optimization

In operations management, my research mainly focused on two specific aspects: packing, routing and stochastic programming.

Packing and Loading. New, fast and accurate lower bounds have been introduced for the Bin Packing

problem. New approaches for the accommodation of items in two and three dimensions have been studied. By means of these new approaches, heuristic algorithms for the bin packing and container packing problems have been developed and tested, obtaining better results than the state-of-the-art methods.

Routing and fleet management. A new family of VRP problems, the Multi-Echelon VRP problems, has been introduced. For the 2-Echelon version of these problems, models, exact and heuristic methods have been developed, including math-heuristics, cluster-based heuristics, and several cut families.

Stochastic problems and management of uncertainty. New deterministic approximations of stochastic problems. Those approximations are able both to give an accurate bound of the stochastic objective function and to predict the optimal stochastic decisions. Definition of new stochastic problems for strategic and tactical decisions in supply chains and transportation systems.

INDIVIDUAL SCIENTIFIC ACTIVITIES

PUBLICATIONS

For brevity, the detailed list of Conference Proceedings is not reported

Index	Value
H-Index (Scopus)	26
Citations (Scopus)	2662
H-Index (Google Scholar)	36
Citations (Google Scholar)	5040

Profile/ID	Link
Google Scholar	https://scholar.google.com/citations?user=2oP7yQ0AAAAJ&hl=en
ORDID	0000-0001-6900-9917
Scopus	16176293900
Publons	https://publons.com/researcher/1548042/guido-perboli/

Publication type	Number
1. Papers in peer-reviewed international journals	51
2. Book chapters	9
3. Books (authored)	1
4. Proceedings of peer-reviewed international conferences	67
5. Books and journal issues (edited)	0
6. Ph.D. thesis	0
7. Patents	3
8. Other	0
Total	**131**

1. Papers in peer-reviewed international journals

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[CP22]   V. Capocasale and G. Perboli. "Standardizing Smart Contracts". *IEEE Access*, 10, 2022, pp. 91203–91212. DOI: `10.1109/ACCESS.2022.3202550`.

[Fad+22]   E. Fadda et al. "A Decision Support System for Supporting Strategic Production Allocation in the Automotive Industry". *Sustainability*, 14.4, 2022, p. 2408. DOI: `10.3390/su14042408`.

[PA21]   G. Perboli and E. Arabnezhad. "A Machine Learning-based DSS for mid and long-term company crisis prediction". *Expert Systems with Applications*, 174, 2021, p. 114758. DOI: `10.1016/j.eswa.2021.114758`.

[PRW21]   G. Perboli, M. Rosano, and Q. Wei. "A Simulation-Optimization Approach for the Management of the On-Demand Parcel Delivery in Sharing Economy". *IEEE Transactions on Intelligent Transportation Systems*, 2021. DOI: `10.1109/TITS.2021.3094851`.

[Per+21a] G. Perboli, L. Brotcorne, M. E. Bruni, and M. Rosano. "A new model for Last-Mile Delivery and Satellite Depots management: The impact of the on-demand economy". *Transportation Research Part E: Logistics and Transportation Review*, 145, 2021, p. 102184. DOI: `10.1016/j.tre.2020.102184`.

[Per+21b] G. Perboli, M. Gajetti, S. Fedorov, and S. L. Giudice. "Natural Language Processing for the identification of Human factors in aviation accidents causes: An application to the SHEL methodology". *Expert Systems with Applications*, 186, 2021, p. 115694. DOI: `10.1016/j.eswa.2021.115694`.

[Cas+20]   P. Castrogiovanni, E. Fadda, G. Perboli, and A. Rizzo. "Smartphone Data Classification Technique for Detecting the Usage of Public or Private Transportation Modes". *IEEE Access*, 8, 2020, pp. 58377–58391. DOI: `10.1109/ACCESS.2020.2982218`.

[Gho+20]   E. Ghorbani et al. "A Survey on Environmentally Friendly Vehicle Routing Problem and a Proposal of Its Classification". *Sustainability*, 12.21, 2020, p. 9079. DOI: `10.3390/su12219079`.

[PM20]   G. Perboli and R. M. "A Taxonomic Analysis of Smart City Projects in North America and Europe". *Sustainability*, 12, 2020, p. 7813. DOI: `10.3390/su12187813`.

[TPM20]   R. Tadei, G. Perboli, and D. Manerba. "The multi-stage dynamic stochastic decision process with unknown distribution of the random utilities". *Optimization Letters*, 14.5, 2020, pp. 1207–1218. DOI: `10.1007/s11590-019-01412-1`.

[Bal+19]   M. M. Baldi, D. Manerba, G. Perboli, and R. Tadei. "A Generalized Bin Packing Problem for parcel delivery in last-mile logistics". *European Journal of Operational Research*, 274.3, 2019, pp. 990–999. DOI: `10.1016/j.ejor.2018.10.056`.

[Bro+19]   L. Brotcorne, G. Perboli, M. Rosano, and Q. Wei. "A Managerial Analysis of Urban Parcel Delivery: A Lean Business Approach". *Sustainability*, 11.12, 2019, p. 3439. DOI: `10.3390/su11123439`.

[FPT19a]   E. Fadda, G. Perboli, and R. Tadei. "A progressive hedging method for the optimization of social engagement and opportunistic IoT problems". *European Journal of Operational Research*, 277.2, 2019, pp. 643–652. DOI: `10.1016/j.ejor.2019.02.052`.

[Giu+19]   R. Giusti et al. "Sustainable and De-Stressed International Supply-Chains Through the SYNCHRO-NET Approach". *Sustainability*, 11.4, 2019, p. 1083. DOI: `10.3390/su11041083`.

[MP19]   D Manerba and G Perboli. "New solution approaches for the capacitated supplier selection problem with total quantity discount and activation costs under demand uncertainty". *Computers and Operations Research*, 101, 2019, pp. 29–42. DOI: `10.1016/j.cor.2018.08.010`.

[PPS19]   S. Pellegrino, G. Perboli, and G. Squillero. "Balancing the equity-efficiency trade-off in personal income taxation: an evolutionary approach". *Economia Politica*, 36.1, 2019, pp. 37–64. DOI: `10.1007/s40888-018-0132-4`.

[PR19]   G. Perboli and M. Rosano. "Parcel delivery in urban areas: Opportunities and threats for the mix of traditional and green business models". *Transportation Research Part C: Emerging Technologies*, 99, 2019, pp. 19–36. DOI: `10.1016/j.trc.2019.01.006`.

[Can+18]   M. Cantamessa, V. Gatteschi, G. Perboli, and M. Rosano. "Startups' Roads to Failure". *Sustainability*, 10, 2018, p. 2346. DOI: `10.3390/su10072346`.

[CPR18]   T. G. Crainic, G. Perboli, and M. Rosano. "Simulation of intermodal freight transportation systems: a taxonomy". *European Journal of Operational Research*, 270.2, 2018, pp. 401–418. DOI: `10.1016/j.ejor.2017.11.061`.

[Cra+18]   T. G. Crainic, F. Maggioni, G. Perboli, and W. Rei. "Reduced cost-based variable fixing in two-stage stochastic programming". *Annals of Operations Research*, 2018, pp. 1–37. DOI: `10.1007/s10479-018-2942-8`.

[FPT18]   E Fadda, G Perboli, and R Tadei. "Customized multi-period stochastic assignment problem for social engagement and opportunistic IoT". *Computers and Operations Research*, 93, 2018, pp. 41–50. DOI: `10.1016/j.cor.2018.01.010`.

[Fad+18]   E. Fadda et al. "Waste Collection in Urban Areas: A Case Study". *Interfaces*, 48.4, 2018. DOI: `10.1287/inte.2018.0943`.

[Fer+18]   F. Ferrero, G. Perboli, M. Rosano, and A. G. A. Vesco. "Car-sharing services: an annotated review". *SUSTAINABLE CITIES AND SOCIETY*, 37, 2018, pp. 501–518. DOI: `https://doi.org/10.1016/j.scs.2017.09.020`.

[MMP18]   D. Manerba, R. Mansini, and G. Perboli. "The Capacitated Supplier Selection problem with Total Quantity Discount policy and Activation Costs under uncertainty". *International Journal of Production Economics*, 198, 2018, pp. 119–132. DOI: `10.1016/j.ijpe.2018.01.035`.

[PMR18]   G. Perboli, S. Musso, and M. Rosano. "Blockchain in Logistics and Supply Chain: A Lean Approach for Designing Real-World Use Cases". *IEEE Access*, 6, 2018, pp. 62018–62028. DOI: `10.1109/ACCESS.2018.2875782`.

[Per+18a]   G. Perboli, F. Ferrero, S. Musso, and A. Vesco. "Business models and tariff simulation in car-sharing services". *Transportation Research Part A*, 115, 2018, pp. 32–48. DOI: `10.1016/j.tra.2017.09.011`.

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[PTF18]   G. Perboli, R. Tadei, and E. Fadda. "New Valid Inequalities for the Two-Echelon Capacitated Vehicle Routing Problem". *Electronic Notes in Discrete Mathematics*, 64, 2018, pp. 75–84. DOI: 10.1016/j.endm.2018.01.009.

[Per+18b]   G. Perboli, M. Rosano, M. Saint-Guillain, and P. Rizzo. "Simulation–optimisation framework for City Logistics: an application on multimodal last-mile delivery". *IET Intelligent Transport Systems*, 12.4, 2018, pp. 262–269. DOI: 10.1049/iet-its.2017.0357.

[PGM17]   G. Perboli, L. Gobbato, and F. Maggioni. "A Progressive Hedging method for the multi-path Traveling Salesman Problem with stochastic travel times". *IMA Journal of Management Mathematics*, 28, 2017, pp. 65–86. DOI: 10.1093/imaman/dpv024.

[Per+17]   G. Perboli et al. "Synchro-Modality and Slow Steaming: New Business Perspectives in Freight Transportation". *Sustainability*, 9.10, 2017, p. 1843. DOI: 10.3390/su9101843.

[PPR17]   F. Perfetti, G. Perboli, and T. R. "The multi-path Traveling Salesman Problem with stochastic travel costs". *EURO JOURNAL ON TRANSPORTATION AND LOGISTICS*, 6, 2017, pp. 3–23. DOI: 10.1007/s13676-014-0056-2.

[Cra+16]   T. G. Crainic, L. Gobbato, G. Perboli, and W. Rei. "Logistics Capacity Planning: A Stochastic Bin Packing Formulation and a Progressive Hedging Meta-heuristic". *EUROPEAN JOURNAL OF OPERATIONAL RESEARCH*, 253, 2016, pp. 404–417. DOI: 10.1016/j.ejor.2016.02.040.

[Per+15b]   G. Perboli, M. Ghirardi, L. Gobbato, and F. Perfetti. "Flights and their economic impact on the airport catchment area: an application to the Italian tourist market". *JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS*, 164, 2015, pp. 1109–1133. DOI: 10.1007/s10957-014-0613-8.

[Bal+14b]   M. M. Baldi, T. G. Crainic, G. Perboli, and R. Tadei. "Branch-and-price and beam search algorithms for the Variable Cost and Size Bin Packing Problem with optional items". *Annals of Operations Research*, 222, 2014, pp. 125–141. DOI: 10.1007/s10479-012-1283-2.

[PTG14]   G. Perboli, R. Tadei, and L. Gobbato. "The multi-handler knapsack problem under uncertainty". *European journal of operational research*, 236, 2014, pp. 1000–1007. DOI: 10.1016/j.ejor.2013.11.040.

[BPT12]   M. M. Baldi, G. Perboli, and R. Tadei. "The three-dimensional knapsack problem with balancing constraints". *Applied Mathematics and Computation*, 218, 2012, pp. 9802–9818. DOI: 10.1016/j.amc.2012.03.052.

[Bal+12b]   M. M. Baldi, T. G. Crainic, G. Perboli, and R. Tadei. "The Generalized Bin Packing Problem". *TRANSPORTATION RESEARCH PART E: LOGISTICS AND TRANSPORTATION REVIEW*, 48, 2012, pp. 1205–1220. DOI: 10.1016/j.tre.2012.06.005.

[Def+12]   F. Deflorio, J. Gonzales-Feliu, G. Perboli, and T. R. "The influence of time windows on the costs of urban freight distribution services in city logistics applications". *EUROPEAN JOURNAL OF TRANSPORT AND INFRASTRUCTURE RESEARCH*, 12, 2012, pp. 256–274. DOI: 10.18757/ejtir.2012.12.3.2965.

[PTB12]   G. Perboli, R. Tadei, and M. M. Baldi. "The stochastic generalized bin packing problem". *Discrete Applied Mathematics*, 160, 2012, pp. 1291–1297. DOI: `10.1016/j.dam.2011.10.037`.

[Tad+12]   R. Tadei, G. Perboli, N. Ricciardi, and M. M. Baldi. "The capacitated transshipment location problem with stochastic handling utilities at the facilities". *International Transactions in Operational Research*, 19, 2012, pp. 789–807. DOI: `10.1111/j.1475-3995.2012.00847.x`.

[Cra+11a]   T. G. Crainic, G. Perboli, W. Rei, and R. Tadei. "Efficient lower bounds and heuristics for the variable cost and size bin packing problem". *COMPUTERS & OPERATIONS RESEARCH*, 38, 2011, pp. 1474–1482. DOI: `10.1016/j.cor.2011.01.001`.

[PTV11]   G. Perboli, R. Tadei, and D. Vigo. "The Two-Echelon Capacitated Vehicle Routing Problem: models and math-based heuristics". *TRANSPORTATION SCIENCE*, 45, 2011, pp. 364–380. DOI: `10.1287/trsc.1110.0368`.

[DPT10]   F. Deflorio, G. Perboli, and R. Tadei. "Freight distribution performance indicators for service quality planning in large transportation networks". *FLEXIBLE SERVICES AND MANUFACTURING JOURNAL*, 22, 2010, pp. 36–60. DOI: `10.1007/s10696-010-9072-1`.

[PTM10]   G. Perboli, R. Tadei, and F. Masoero. "New Families of Valid Inequalities for the Two-Echelon Vehicle Routing Problem". *ELECTRONIC NOTES IN DISCRETE MATHEMATICS*, 36, 2010, pp. 639–646. DOI: `10.1016/j.endm.2010.05.081`.

[CPT09]   T. G. Crainic, G. Perboli, and R. Tadei. "TS2PACK: A Two-Level Tabu Search for the Three-dimensional Bin Packing Problem". *EUROPEAN JOURNAL OF OPERATIONAL RESEARCH*, 195, 2009, pp. 744–760. DOI: `10.1016/j.ejor.2007.06.063`.

[TRP09]   R. Tadei, N. Ricciardi, and G. Perboli. "The Stochastic p-Median Problem with Unknown Cost Probability Distribution". *OPERATIONS RESEARCH LETTERS*, 37, Issue 2, 2009, pp. 135–141. DOI: `10.1016/j.orl.2009.01.005`.

[CPT08]   T. G. Crainic, G. Perboli, and R. Tadei. "Extreme-Point-based Heuristics for the Three-Dimensional Bin Packing problem". *INFORMS JOURNAL ON COMPUTING*, 20, 2008, pp. 368–384. DOI: `10.1287/ijoc.1070.0250`.

[PPT08]   G. Perboli, F. Pezzella, and R. Tadei. "EVE-OPT: an Hybrid Algorithm for the Capability Vehicle Routing Problem". *MATHEMATICAL METHODS OF OPERATIONS RESEARCH*, 68, 2008, pp. 361–382. DOI: `10.1007/s00186-008-0236-7`.

[Cra+07a]   T. G. Crainic, G. Perboli, M. Pezzuto, and R. Tadei. "Computing the Asymptotic Worst-case of Bin Packing Lower Bounds". *EUROPEAN JOURNAL OF OPERATIONAL RESEARCH*, 183, 2007, pp. 1295–1303. DOI: `10.1016/j.ejor.2005.07.032`.

[Cra+07b]   T. G. Crainic, G. Perboli, M. Pezzuto, and R. Tadei. "New Bin Packing Fast Lower Bounds". *COMPUTERS & OPERATIONS RESEARCH*, 34, 2007, pp. 3439–3457. DOI: `10.1016/j.cor.2006.02.007`.

[TPDC02] R. Tadei, G. Perboli, and F. Della Croce. "A heuristic algorithm for the Auto-Carrier transportation problem". *TRANSPORTATION SCIENCE*, 36, 2002, pp. 55–62. DOI: `10.1287/trsc.36.1.55.567`.

2. Book chapters

[CPR21] T. G. Crainic, G. Perboli, and N. Ricciardi. "City Logistics". In: T. G. Crainic, M. Gendreau, and B. Gendron (eds.), *Network Design with Applications to Transportation and Logistics*, Springer International Publishing, 2021, pp. 507–537. DOI: `10.1007/978-3-030-64018-7_16`.

[FPT19b] E. Fadda, G. Perboli, and R. Tadei. "An Algorithm for the Optimal Waste Collection in Urban Areas". In: *A View of Operations Research Applications in Italy, 2018*, Springer, 2019, pp. 153–165.

[PM18] G. Perboli and M. Marciani. "La logistica urbana sostenibile quale volano perl'economia italiana". In: M. Deandreis (eds.),, vol. 6. Un Sud che innova e produce. Giannini Editore, 2018. Chap. XIV, pp. 373–393.

[TPM18] R. Tadei, G. Perboli, and D. Manerba. "A recent approach to derive the multinomial logit model for choice probability". In: P. Daniele and L. Scrimali (eds.), *New Trends in Emerging Complex Real Life Problems*, Springer, 2018, pp. 473–481. DOI: `10.1007/978-3-030-00473-6_50`.

[Man+13] S. Mancini, T. G. Crainic, G. Perboli, and R. Tadei. "GRASP with Path-Relinking metaheuristic for the Two-Echelon Vehicle Routing Problem". In: L. Di Gaspero and T. Schaerf A.and Stützle (eds.), *Advances in Metaheuristics*, Springer, 2013, pp. 113–125. DOI: `10.1007/978-1-4614-6322-1_7`.

[CPT12] T. Crainic, G. Perboli, and R. Tadei. "Recent Advances in Multi-dimensional Packing Problems". In: C. Volosencu (eds.), *New Technologies - Trends, Innovations and Research. ISBN: 978-953-51-0480-3*, InTech, 2012, pp. 91–110.

[BPT11] M. M. Baldi, G. Perboli, and R. Tadei. "The three dimensional knapsack problem with balancing constraints". In: M. Castano et al. (eds.), *Proceedings of OR Peripatetic Post-Graduate Programme: ORP3-2011*, UCA-Universidad de Cádiz, 2011, pp. 131–135.

[TP11] R. Tadei and G. Perboli. "The generalized bin packing problem under uncertainty." In: V. Vasek et al. (eds.), *Recent researches in applied and computational mathematics*, WSEAS Press., 2011.

[Col+03] L. Colaneri, F. Della Croce, G. Perboli, and R. Tadei. "A heuristic procedure for Rack Configuration in the Space Vehicle Accommodation problem". In: T. Ciriani, G. Fasano, S. Gliozzi, and R. Tadei (eds.), *Operations Research in Space and Air*, Kluwer Academic Publishers, 2003, pp. 27–42.

3. Books (authored)

[Ale21]   Alessandro Artusi et al. *Towards Pervasive and Trustworthy Artificial Intelligence: How standards can put a great technology at the service of humankind.* MPAI, 2021, pp. 1–239. URL: https://mpai.community/2021/12/18/towards-pervasive-and-trustworthy-artificial-intelligence/.

4. Proceedings of peer-reviewed international conferences

[CMP22]   V. Capocasale, S. Musso, and G. Perboli. "Interplanetary File System in Logistic Networks: a Review". *2022 IEEE 46th Annual Computers, Software, and Applications Conference (COMPSAC)*, 2022, pp. 1684–1689. DOI: 10.1109/COMPSAC54236.2022.00268.

[Mus+22]   S. Musso et al. "Innovative Business Models in Ports' Logistics". *2022 IEEE 46th Annual Computers, Software, and Applications Conference (COMPSAC)*, 2022, pp. 1702–1707. DOI: 10.1109/COMPSAC54236.2022.00271.

[BPR21]   A. Bauchiero, G. Perboli, and M. Rosano. "Smart Home applied to historic buildings A real case study". *2021 IEEE 45th Annual Computers, Software, and Applications Conference (COMPSAC)*, Madrid, Spain. IEEE, 2021, pp. 1273–1278. DOI: 10.1109/COMPSAC51774.2021.00177.

[Cap+21]   V. Capocasale, D. Gotta, S. Musso, and G. Perboli. "A Blockchain, 5G and IoT-based transaction management system for Smart Logistics: an Hyperledger framework". *2021 IEEE 45th Annual Computers, Software, and Applications Conference (COMPSAC)*, Madrid, Spain. IEEE, 2021, pp. 1285–1290. DOI: 10.1109/COMPSAC51774.2021.00179.

[Fad+21]   E. Fadda, S. Fedorov, G. Perboli, and I. D. C. Barbosa. "Mixing machine learning and optimization for the tactical capacity planning in last-mile delivery". *2021 IEEE 45th Annual Computers, Software, and Applications Conference (COMPSAC)*, Madrid, Spain. IEEE, 2021, pp. 1291–1296. DOI: 10.1109/COMPSAC51774.2021.00180.

[Per+21c]   G. Perboli et al. "Using machine learning to assess public policies: a real case study for supporting SMEs development in Italy". *2021 IEEE Technology Engineering Management Conference - Europe (TEMSCON-EUR)*, 2021, pp. 1–6. DOI: 10.1109/TEMSCON-EUR52034.2021.9488581.

[WPR21]   Q. Wei, G. Perboli, and M. Rosano. "Branch and price for the time-dependent green vehicle routing problem with time windows in real road network". *International Federation of Operational Research Societies (IFORS 2021)*, 2021.

[PCG20]   G. Perboli, V. Capocasale, and D. Gotta. "Blockchain-Based Transaction Management in Smart Logistics: A Sawtooth Framework". *2020 IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC)*, Madrid, Spain. IEEE, 2020, pp. 1713–1718. DOI: 10.1109/COMPSAC48688.2020.000-8.

[PFR20]   G. Perboli, S. Fedorov, and M. Rosano. "The European Concept of Smart City: A Taxonomic Analysis". *2020 IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC)*, Madrid, Spain. IEEE, 2020, pp. 1725–1730. DOI: 10.1109/COMPSAC48688.2020.000-6.

[PRW20]   G. Perboli, M. Rosano, and Q. Wei. "A simulation-optimization framework for crowdsourcing in the last mile." *Proceedings of ODS2020 - Optimization and Decision Science*, AIRO, 2020.

[Per+19]   G. Perboli, A. Manfredi, S. Musso, and M. Rosano. "A Decentralized Marketplace for M2M Economy for Smart Cities". *Proceedings of the 2019 IEEE 28th International Conference on Enabling Technologies: Infrastructure for Collaborative Enterprises, WETICE 2019*, Institute of Electrical and Electronics Engineers Inc., 2019, pp. 27–30. DOI: 10.1109/WETICE.2019.00014.

[MP18]   D. Manerba and G. Perboli. "A Progressive Hedging approach for a Supplier Selection Problem under Total Quantity Discount and Demand Uncertainty". *7th International Workshop on Freight Transportation and Logistics, Odysseus 2018, Cagliari, Italy*, 2018.

[MG18]   R. Mariangela and P. Guido. "Opportunities and threats of mixing delivery options in the e-commerce era". *6th INFORMS TSL Workshop, Hong Kong*, INFORMS, 2018.

[PR18]   G. Perboli and M. Rosano. "A decision support system for optimizing the last-mile by mixing traditional and green logistics", vol. 262. Lecture Notes in Business Information Processing. 2018, pp. 28–46. DOI: 10.1007/978-3-319-73758-4_3.

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7. Patents

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[Per22b]   G. Perboli. "Compression and Understanding of Industrial Data". Standard IEEE 3303. 2022.

[Per21]   G. Perboli. "Metodo e sistema per prevedere il fallimento di una entitá monitorata". Pat. 102021000001424. 2021.

—————— AWARDS AND RECOGNITIONS

Academic Award	Winner of the Prize "Support for Young Researchers" given by Politecnico di Torino to young researchers with an outstanding publication record (2011).
Best paper award	Finalist at the best paper award of the seventh annual IEEE Conference on Automation Science and Engineering (IEEE CASE 2011, Trieste, Italy, August 24-27, 2011).
Foreign academic qualification	France, 2006: qualification as "maître de conférence" for the sections "Mathématiques appliquées et applications des mathématiques" (26), "Informatique" (27) et "Génie informatique, automatique et traitement du signal" (61) of Conseil National des Universités.

—————— RESEARCH PERIODS ABROAD

From (mm/yyyy)	To (mm/yyyy)	Institution/University	Role
05/2019	05/2019	CIRRELT - Montréal	Invited researcher
10/2017	10/2017	CIRRELT - Montréal	Invited researcher
10/2016	10/2016	CIRRELT - Montréal	Invited researcher
10/2015	11/2015	CIRRELT - Montréal	Invited researcher
10/2014	11/2014	CIRRELT - Montréal	Invited researcher
09/2013	10/2013	CIRRELT - Montréal	Invited researcher
09/2012	09/2012	CIRRELT - Montréal	Invited researcher
07/2011	08/2011	CIRRELT - Montréal	Invited researcher
04/2010	05/2010	CIRRELT - Montréal	Invited researcher
08/2009	08/2009	CIRRELT - Montréal	Invited researcher
08/2008	08/2008	CIRRELT - Montréal	Invited researcher
08/2007	08/2007	CRT - Montréal	Invited researcher
05/2006	06/2006	CRT - Montréal	Invited researcher

COMMON INTEREST SCIENTIFIC ACTIVITIES

—————— C.1. RESEARCH PROJECTS IN CHARGE

No industrial contracts (see C.5.).

Project name	Project type	Period	Project	Research Unit
(Sponsor)	L: Local N: National E: European O: Other		coordinator	coordinator

Prof. Guido Perboli, PhD
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15/29

SINFONICA - 4M Euro. The SINFONICA project stems from the vision of developing innovative and efficient methodologies and strategies to foster the acceptance and deployment of Cooperative, Connected and Automated Mobility (CCAM) solutions through user engagement activities and the various stakeholders involved in the transport sector (public administrations, transport operators, service providers, technology suppliers). Prof. Perboli is responsible of the Innovation Management of the projects. The group of prof. Perboli will lead the verticalization and integration of its Lean Business methodology GUEST with the other approaches for gathering and understanding the needs, expectations, concerns and desires of the different categories of Vulnerable Road Users (elderly, immigrants, disabled, etc.), with the aim of making CCAM solutions more inclusive and accessible.	E	2022-2025	X
Next Generation UPP - 9M Euro. Italian project for increasing the efficiency of the justice offices and tribunals of the North-West area of Italy. Prof. Perboli leads the unit of Politecnico di Torino to map the processes, define the new KPIs for the evaluation of the processes and identify the improvement actions.	N	2021-2023	X

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16/29

5G-LOGINOV - 8M Euro. The project brings together 15 partners to evaluate and showcase the added value of 5G technology in logistics and port operations in three Living Labs (Athens (GR), Hamburg (GE) and Luka Koper (SV)), and will support the adoption and take-up of 5G enabled next-generation operation systems of ports and logistics hubs in Europe and beyond. The group of prof. Perboli is responsible of the development of the new products and services, as well as helping SMEs and startups in their business development.	E	2020-2024	X
IncitEV - 12M Euro. INCIT-EV project aims to demonstrate an innovative set of charging infrastructures, technologies and its associated business models, ready to improve the EV users' experience. The project will last 4 years with the evolution of differentiated phases. 5 demo environments at urban, peri-urban and extra-urban conditions will be ready for the deployment of 7 use cases. The group of prof. Perboli, is responsible of the development of the pricing strategies for the EV charging network and the estimation of the impact of exogenous variables (Political, Economic, Social and Technological) on the penetration curves of EV in the near future.	E	2020-2024	X

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17/29

CONCORDIA - 16M Euro. The Cyber security cOmpeteNCe fOr Research anD InnovAtion project (CONCORDIA) is an EU-funded multi-disciplinary research and innovation project. It has set out to address this current fragmentation and further enhance the EU's digital sovereignty. The project aims to interconnect all of Europe's cybersecurity capabilities into a network of expertise to help build a secure, trusted, resilient and competitive ecosystem. Moreover, it will develop the EU Cybersecurity Research and Innovation Roadmap. The group of prof. Perboli leads the deployment of Blockchain solutions for the automotive battery supply chain with the Stellantis group.	E	2019-2022	X
M1M - Collaborative Research and Development Grants - 1.8M Cad$ (NSERC - Canada). The project focuses on the design, planning and management of M1M systems for the development of new services for the consolidation of the freight demand.	O	2020-2022	X
City Freight Logistics (Norway). The primary objective of the research project Freight Logistics in Sustainable Cities (CityFreight) is to provide public authorities, particularly in smaller, topologically complicated, cities with a toolbox for realistically evaluating major decisions that would make a city more energy-efficient and sustainable in terms of freight transportation.	O	2020-2022	X

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18/29

Urban Mobility and Logistics Systems Multi-departmental Lab of Politecnico di Torino - 500K euro. The Lab, part of the CARS@Polito Interdepartmental Center, focuses on the multi-faceted issues of designing, planning, and managing economically-efficient & environmentally-conscious smart integrated urban transport systems, providing high-quality mobility for people and goods, and contributing to the sustainable development of the city.	N	2017-2019	X	
SynchroNET - 7M euro. The SYNCHRO-NET project will show how a powerful and innovative SYNCHRO-modal supply chain eco-NET can catalyse the uptake of the slow steaming concept and synchro-modality, guaranteeing cost-effective robust transport solutions that slow down and better organise the supply chain to reduce emissions and costs for logistics operations.	E	2016-2019		X
UrbeLog (Smart City) - 7M euro. The URBeLOG project aims to develop and test an innovative open, dynamic and cooperative telematics platform providing services and applications for the last mile logistics in urban areas, It enables to aggregate the stakeholders' transport ecosystem and to manage the distribution processes from production to delivery in real-time.	N	2013-2015	N	X
ORNet 50K euro (Politecnico di Torino)	N	2007-2009	X	

—————— MEMBERSHIP IN BOARDS/COMMITTEES/RESEARCH CENTERS ETC.

Type	Name	Role	Period (yyyy/yyyy)

Prof. Guido Perboli, PhD
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Politecnico di Torino

19/29

Committee	IEEE Standard Association. Member of the Working Group for the definition of the standard Compression and Understanding of Industrial Data - Standard N. P3303.	Representative of MPAI and Politencico di Torino	2022-2023
Committee	MPAI. Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI) is an international non-profit organization with the mission is to develop AI enabled digital data compression specifications, created by Leonardo Chiariglione, worldwide known entrepreneur and researcher, as well as creators, among the others, of the MP3 standard	Representative of Politecnico di Torino. In MPAI he is also one of the proposers of the MPAI standard for data exchange between AI forecast algorithms and company financial data.	2021-Today
Committee	Editorial Board of the Journal of Applied Research and Technology - JART	Associate Editor	2020-Today
Committee	MOBI Alliance. MOBI is a member-led consortium working to make transportation greener, more efficient, and more affordable, using blockchain and related technologies	Delegate of Politecnico di Torino in the Logistics Chapter	2019-Today
Committee	Policy Table for Infrastructures, Logistics and Supply Chain - CONFINDUSTRIA PIEMONTE	Technical expert representative for the Politecnico di Torino	2019-Today

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20/29

Committee	Urban Mobility and Logistics Systems (UMLS) Lab, the Mobility and Logistics branch of CARS@Polito, the Interdepartmental Lab on Automotive and Mobility Center of Politecnico di Torino	Head of UMLS	2018-Today
Committee	ICT for City Logistics and Enterprises Lab - ICELAB@Polito	Director	2016-Today
Committee	Digital Hub of Compagnia delle Opere (more than 30000 companies)	Scientific and Steering Committee	2017-Today
Committee	Editorial Board of the Sustainability journal (Impact Factor 2017: 2.075)	Associate Editor of the Sustainable Transportation section	2018-Today
Committee	MOTUS-E, the first Italian association of automotive and industrial companies, Universities and Stakeholders for the electric mobility	Delegate of Politecnico di Torino	2018-2021
Committee	Amazon Innovation Award (AIA). AIA is the Amazon challenge for student innovation in Last-Mile and Supply Chain Management	Member of the Board	2017-2020
Committee	TEMSCON 2021 - 2021 IEEE Technology & Engineering Management Conference - Europe, Dubrovnik, Croatia	Technical Program Committee member	2021

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21/29

Committee	SSMLS 2021 - 3rd IEEE International Workshop on Smart, Sustainable Mobility & Logistics in Smart Cities (at COMPSAC 2021)	Workshop Chair	2021
Committee	SSMLS 2020 - 2nd IEEE International Workshop on Smart, Sustainable Mobility & Logistics in Smart Cities (at COMPSAC 2020, Madrid, Spain)	Workshop Chair	2020
Committee	Digital Agenda for the Regional Council of Piedmont 2019-2029	Head of the Pillar Mobility	2019
Committee	Policy Table for Logistics and Mobility - Regional Council of Piedmont 2019-2021	Head of the Table	2019
Committee	Italian National Agency for the Evaluation Of Universities And Research Institutes	Area Expert	2019-Today
Committee	AROSA 2019-Conference Track @ the 29th WETICE Conference, Capri, Italy	Program Committee	2018-2019
Committee	International Conference on Optimization and Decision Sciences, Genoa, Italy	Scientific Committee	2018-2019
Committee	International Conference on Stochastic Programming 2019, Trondheim, Norway	Scientific Committee	2018-2019
Committee	Odysseus 2018	Scientific Committee	2017-2018

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22/29

Committee	SSMLS 2017 - 1st IEEE International Workshop on Smart, Sustainable Mobility & Logistics in Smart Cities (at COMPSAC 2017, Turin, Italy)	Workshop Chair	2017
Committee	Member of SOSLOG - Association of Sustainable logistics	Scientific Board	2017-Today
Committee	Member of the PhD in Management, University of Turin	PhD Board	2017-Today
Committee	INFORMS Transportation Science and Logistics Workshop 2018	Scientific and Steering Committee	2016-2018
Committee	Network Optimization Workshop 2017	Scientific Committee	2016-2017
Committee	Odysseus 2015	Scientific Committee	2014-2015
Committee	Network Optimization Workshop - NOW 2013	Scientific Committee	2012-2013
Committee	13th International Conference on Stochastic Programming	Scientific Committee	2012-2013
Committee	Odysseus 2012	Scientific Committee	2011-2012
Research Center	CIRRELT	Associate Member	2008-Today
University	UQAM – Université du Quebec a Montréal	Member of the "Chaire de recherche industrielle du CRSNG en management logistique"	2008-2010
Board	AIRO	AIRO Steering Committee member	2004-2007
Board	AIRONews	Editorial Board member	1999-2005

──────── INVITED LECTURES AND SEMINARS

Date (mm/yyyy)	Type	Institution/University/Conference

Prof. Guido Perboli, PhD
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23/29

06/2021	Invited Speaker	Sharif University of Technology, Department of Industrial Engineering, Virtual Seminar. Title: Designing a sustainable and resilient last-mile logistics in the digital revolution era
05/2020	Invited Speaker	EFMA - European Association of Banks and Insurances, Virtual Seminar. Title: Risk Management - SME current scenario (Italy case)
03/2018	Invited Speaker	2018 9th IFIP International Conference on New Technologies, Mobility & Security, Paris, France. Title: Applications of Blockchain to Supply Chain and Logistics: emerging trends and new challenges
09/2017	Keynote speaker	Workshop Optimization of Intermodal Freight Transportation, Valenciennes, France. Title: Parcel delivery in urban areas: opportunities and threats for the mix of new business models and technologies
05/2016	Keynote speaker	International Conference on Big Data-Based Healthcare Operations and Logistics Management, Chengdu, Sichuan, China. Title: Vehicle routing: recent trends and new challenges
05/2016	Keynote speaker	Summit on Constructing the Shipping and Logistics Center at the Combined Port of Sichuan, Yunnan, Guizhou Provinces in Luzhou, Sichuan, China. Title: Smart Cities in a Smart World.
2004-2016	Seminar	Seminars in several Istitutions, including CIRRELT, Montréal, University of Bergamo, Politecnica delle Marche, Serbian Academy of Sciences and Arts, Belgrade, Univ. Wien.
11/2020	Seminar	CIRRELT, Montréal.
10/2018	Seminar	CIRRELT, Montréal.
10/2018	Seminar	CIRRELT, Montréal.
10/2017	Seminar	CIRRELT, Montréal.
10/2016	Seminar	CIRRELT, Montréal.
10/2015	Seminar	CIRRELT, Montréal.
10/2014	Seminar	CIRRELT, Montréal
10/2013	Seminar	CIRRELT, Montréal
03/2013	Seminar	University of Bergamo
09/2012	Seminar	CIRRELT, Montréal
04/2009	Seminar	CIRRELT, Montréal
02/2008	Seminar	Univ. Politecnica delle Marche
10/2007	Seminar	Univ. Wien
08/2007	Seminar	CIRRELT, Montréal
02/2007	Seminar	Univ. Politecnica delle Marche
12/2006	Seminar	Univ. Cesena

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| 06/2006 | Seminar | Serbian Academy of Sciences and Arts, Belgrade |
| 05/2006 | Seminar | CRT, Montréal |

COMMUNITY ACTIVITIES

Type	Period (yyyy/yyyy)
Member of the table "Smart Road" of ANAS S.p.A. as expert in Digital Transformation and AI	2022-Today
Coordinator of the pillars "University, Research and Innovation" and 'Transportation, Infrastructure and Smart Cities' of the "Democrazia Cristiana" Foundation	2020-Today
Member of the Think Tank of the Freight Leaders Council and Ebilog on the future of logistics in Italy	2020-Today
Member for the Politecnico di Torino of the Board for Logistics Plan of the Regional Council of Piedmont, Italy	2019-Today
Technical expert and representative for the Politecnico di Torino in the policy table for Infrastructures, Logistics and Supply Chain - CONFINDUSTRIA PIEMONTE	2019-Today
Member of the Board and Head of the Urban Mobility pillar of the Center for Automotive Research and Sustainable mobility - CARS@PoliTO Interdepartmental Center of Politecnico di Torino	2018-Today
Co-founder and member of the EURO Working Group on Practitioners	2018-2020
Director if the ICT for City Logistics and Enterprises Center of Politecnico di Torino	2016-Today
Chair of TOP Experiences, meetings at Politecnico di Torino with International top managers	2014-2020
Chair of the Young Thematic Branch of AIRO	2006-2008
Chair of the Organizing Committee of the I FIMA International Conference - Models and Methods for Human Genomics	2005-2006

INDUSTRIAL TRAINING

Type	Period (yyyy/yyyy)
Course in Innovation Management and Lean Business in Italdesign	2019
Scientific Direction of the TANGRAM Project - Project for the training in Industry funded by Fondimpresa	2018-2019

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Course in Mobility for the Regional Council of Alto Adige - Module: Urban planning and strategies for sustainable mobility	2018
Course for Executive in Digital Transformation by Skillab/Fondirigenti - Module Digital business models	2018
Course in Lean in TIM JoL	2017
Course for Executive in Digital Transformation by Skillab - Module Business model and digital transformation	2015
Scientific Direction fo the Master ANCI Smart and Sustainable Mobility in Urban Areas	2015
Master Management of Smart Cities - Module: City Logistics: Models methods and case studies	2014

———— EVALUATION OF INDUSTRIAL AND INNOVATION MANAGEMENT PROJECTS

Type	Period (yyyy/yyyy)
Mentor of startups in I3P, the Incubator of the Politecnico di Torino	2015-Today
Evaluation of Projects in the NSERC Discovery Grant Program of the Government of Canada	2018-Today
Evaluation of Startup and Innovation Projects for the Council of the Province of Trento	2018-Today
Evaluation of Startup and Innovation Projects for the Regional Council of Campania	2017-Today
Evaluation of Projects in the National Science Centre of the Government of Poland	2022
Scientific Expert of the Digital Hub of Compagnia delle Opere (Hub in the EU list of Digital and Innovation Hub)	2018-2021
Mentor in TIM Join Open Labs and TIM Working Capital of startups (mainly ICT and robotics markets)	2015-2017
Member of the committee of the MoU between Poste Italiane s.p.a. and Politecnico di Torino	2015-2018

———— TECHNOLOGY TRANSFER

Industrial contracts (only if Project Leader), consultancy services, workshop/seminar for companies, etc.

Type	Period (yyyy/yyyy)

Member of the table for the standard 3303 of IEEE Standard "AI-based Compression and Understanding of Industrial Data"	2023
Head of the group for the development of the standard "AI-based Compression and Understanding of Industrial Data" by MPAI, Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI-CUI), publication date: 15/10/2021	2021
PI in the industrial contract with TIM for a field trial on Narrow-band technologies in 5G networks and their integration with Blockchain and IoT in Supply Chains	2020
EFMA - no-profit organization created in 1971 by leading European banks, with a network of over 3,300 bank and insurance brands in 130 countries all around the world. Lead of the co-creation table on the prevention of SMEs crisis. (http://www.efma.com/)	2020
Shareholder and and Chief Scientific Officer of Arisk S.p.a. - the leading Italian Startup in the automatic evaluation of risk and corporate crisis (http://www.arisk.it/)	2018-Today
Local Unit coordinator of a Collaborative Research and Development Grant by NSERC, Canada, in collaboration with Clear Destinations inc. - 1.8MCad	2020-2024
PI in the industrial contract with CRF/FCA for the development Blockchain and IoT solutions for the Electric Batteries Supply Chain	2020
PI in the industrial contract with TIM for the development of the integration of Blockchain and IoT in Supply Chains	2019
PI in the industrial contract with Italdesign for the development of Innovation Strategies for Smart Cities services	2019
PI in the industrial contract with FCA for the development of a DSS for the strategic process of the procurement of the spare parts	2017-2018
PI in the industrial contract with TIM for the integration of business discovery processes and innovation management in the Innovation branch of the company	2016-2017
PI in the industrial contract with PonyZero srl, a startup of Politecnico di Torino for a fleet routing and management tool	2015-2016
Academic supervisor of 5 industrial Lagrange grants funded by the CRT Foundation	2008-2017
Chief Scientific Officer in BDS srl, Turin	2007-2017
PI in the industrial contract with BDS srl, Turin, for the development and the analysis of Customer Satisfaction and Profiling questionnaires	2008-2013
Coordinator of ICARO2 Project, funded by HP Philanthropic Grants	2002-2003

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Coordinator of ICARO Project, funded by HP Philanthropic Grants   2000-2001

TEACHING ACTIVITIES

TEACHING IN CHARGE

He is presently Professor of the courses of Operations Research in the Bachelor of Industrial Production of Politecnico di Torino, Industrial strategies and Professional Ethics in the Master of Industrial Production and Innovation Management of Politecnico di Torino, Decision Making and AI for business change in the Master of Industrial Production and Innovation Management of Politecnico di Torino, and Lean Business and Innovation Management at the Ph.D. School of Politecnico di Torino (soft skill course).

Number of credits (CFU) per academic year, level, scientific sector (S.S.D.), and language

Academic Year (yyyy/yyyy)	Bachelor Italian	Bachelor English	Master Italian	Master English	Ph.D. Italian	Ph.D. English	Specializing Master Italian	Specializing Master English	S.S.D.	Total
2021/2022	6			6					MAT/09	16
						4			INGIND/35	
2020/2021	6								MAT/09	10
						4			INGIND/35	
2019/2020	6								MAT/09	16
			6			4			INGIND/35	
2018/2019	6								MAT/09	18
			8			4			INGIND/35	
2017/2018	6					4			MAT/09	22
			8			4			INGIND/35	
2016/2017	6					4			MAT/09	22
			8			4			INGIND/35	
2015/2016	6					4			MAT/09	18
			8						INGIND/35	
2014/2015	6					4			MAT/09	10
2013/2014	6								MAT/09	6
2012/2013	6								MAT/09	6
2011/2012	5								MAT/09	5
2010/2011	5		5						MAT/09	10
2009/2010	5		5						MAT/09	10
2008/2009	5								MAT/09	5

PH.D. SUPERVISION

Ph.D. Laureates supervised

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PhD Cycle	Ph.D. Laureates
XXXIV	Wei Qu
XXXI	Mariangela Rosano
XXX	Edoardo Fadda
XXVII	Luca Gobbato
XXIII	Simona Mancini

Ph.D. currently in the PhD program

PhD Cycle	Ph.D. Laureates
XXXVII	Filippo Velardocchia
XXXVI	Vittorio Capocasale
XXXV	Stanislav Fedorov

Turin, February 3, 2023

Full Professor, Politecnico di Torino
Associate Member, CIRRELT, Montreal, Canada

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