BERNARD GENDRON (1966-2022): FRIEND and COLLEAGUE

On July 17, 2022, our friend and colleague Bernard Gendron passed away, after losing his battle against an unforgiving illness. Bernard was Professor of Operations Research in the Département d'informatique et de recherche opérationnelle (DIRO - Computer Science and Operations Research) of Université de Montréal and an important member of CIRRELT, the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation.

After undergraduate studies in mathematics, Bernard started displaying his innate talent for research during his master's degree at DIRO. His master's thesis laid the foundations of his brilliant career, addressing a challenging, recently-defined logistics problem through network-design modelling and a parallel exact enumerative algorithm. In this, Bernard was an important member of the team that started the Montreal research work on parallel optimization. He followed with an exceptional Ph.D. dissertation, still at DIRO, on multicommodity capacitated fixed charge network design applied to planning transportation and logistics systems. The thesis included several important contributions to the understanding, modelling, and solution of network design problems, as well as to the development of parallel optimization, for which he received the 1995 Best Dissertation Award of the Transportation Science Section of INFORMS. Impressed by the quality of his work, DIRO hired Bernard as a tenure-track faculty member, even before his dissertation defense.

In the years that followed, Bernard pursued a very active academic career combining top-level research with teaching and transfer activities. In these, he showed that he was a true great Operations Research scientist, harmoniously blending applications and methodology to push the science envelope and address relevant and challenging problems of substantial industrial and

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societal interest. From the very beginning of his research work, Bernard was highly motivated by such applications, in particular in transportation and logistics (system and service network design for freight carriers and distribution networks, forestry problems), scheduling of tasks and personnel, and fixed and wireless telecommunication networks planning and management. As it is typical of the field, addressing practical problems led him to study and develop the relevant methodological part of Operations Research and Mathematical Programming, focussing on combinatorial optimization and integer programming, e.g., graph theory, location, network design, and routing.

In its applied and methodological work alike, Bernard deployed its creativity and considerable knowledge to both modelling and algorithmic development. For the applications he addressed, Bernard searched for the mathematical formulation which would simultaneously capture the essence of the problem at hand and be amenable to an efficient solution method, in order to yield the numerical results required by the application. To reach this goal, Bernard applied the significant understanding and tools developed studying the more "abstract", generic problem classes in combinatorial optimization, e.g., reformulation techniques and polyhedral analysis.

To address the highly challenging problems raised by the generic and applied models he studied, Bernard left no stone unturned and explored a wide range of mathematical optimization methodologies. He cunningly employed existing techniques and proposed significant methodological advances in diverse fields as Lagrangian relaxation, column generation, Benders' decomposition, logic-based constraint programming, cutting planes and enumerative (Branch & Bound, Cut) algorithms, and meta- and math-heuristic solution methods. Since the early days of his career, he was a pioneer and an avid proposer of parallel optimization.

Bernard had both a passion and a special knack for continuously revisiting even decades-old models and problems, and finding new and original reformulations and solution approaches. He was never sated of studying general models with many practical applications, and proposing novel ways of viewing, decomposing, and approaching them. The many variants of the multicommodity network flow and design problems formed one of its most passionate fields of work, yielding some of his more important and long-lasting contributions to science and Operations Research. The "Exact Methods for Fixed-Cost Network Design" chapter in the "Network Design with Applications to Transportation and Logistics" book he recently co-edited synthesizes his immense heritage in the field. This unabated curiosity is the hallmark of a truly exceptional researcher, such as he was.

A large part of Bernard’s work was performed in the context of very lively international collaborations with colleagues from top institutions and companies from around the world. These include MIT in Boston, EPFL in Lausanne, ILOG in Paris, École Centrale in Lille, and the universities of Pisa, Lisbon, Nice-Sophia-Antipolis, Clermont-Ferrand (Blaise-Pascal), Versailles and Valenciennes, among others. These international collaborations also gave rise to several participations in specialized doctoral schools.

Bernard’s talent as a researcher created many interesting opportunities. Among these, he was the chairholder of two important chairs: an industrial one, funded by the company Purolator, on data intelligence for logistics, and a chair on green technologies, funded by the government of Quebec, dealing with the transformations in the transportation sector.

Besides his primary interest in science and research, Bernard also cared immensely for the scientific and academic community, both in Montreal and abroad. Over time, this led him to accept

a number of duties and tasks in a variety of roles. In 2008, Bernard was selected to become the first director of CIRRELT, the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation. Born from the merger of various research groups in five different universities, CIRRELT flourished under Bernard's skillful stewardship of eight years and became one of the leading research centres in logistics and transportation in the world. A few years later, Bernard was asked to become Adjunct Vice-Rector of Research, Discovery, Creation, and Innovation of Université de Montréal in 2021. Unfortunately, illness prevented him from accomplishing as much as he could have in that position.

Bernard displayed the same energy and gift for stewardship with respect to learned societies, which brought him great appreciation and respect in the community. He was thus first elected President of the Transportation Science Section of INFORMS (2001-2002, after serving as Treasurer and Vice-President), before becoming the first President of the Section on Transportation Science and & Logistics (2002-2003). Bernard was also deeply committed to the Canadian Operational Research Society (CORS), in which he held many positions from President of the Montreal section to Council member to President (2004-2005). CORS recognized Bernard's outstanding contributions to Canadian Operations Research by bestowing him no less than three major distinctions: the Award of Merit (2010), the Service Award (2006), and the Practice Prize (2004).

Bernard was also very active in scientific publishing. After serving as Associate Editor of *INFOR* from 2004 to 2006, he was Editor in Chief of this journal from 2006 to 2014. He has also been Area Editor "Combinatorial Optimization" of RAIRO-Operations Research since 2019 and member of the editorial board of *Constraint Programming Letters* and of the *EURO Journal on Transportation and Logistics* since 2006 and 2012, respectively. Always at the forefront of transformations, he was also one of the founders, and Section Editor for "Computational aspects and applications", of the *Open Journal of Mathematical Optimization*, the first completely Gold Open Access journal in the OR area.

Bernard was involved in the organization of several conferences and workshops as member of their organizing or scientific committees. These scientific events include, among others, the *CORS/INFORMS International Meeting* of 2009, the *IFORS Triennial Meeting* in 2017, the *ISCO* 2022 as well as several editions of the *Odysseus*, *CP-AI-OR*, and *Optimization Days* series of international conferences.

Bernard paid its due share to research evaluation and assessment activities, either as a member of national or provincial funding agencies committees or as external dissertation evaluator for universities around the world.

One of Bernard's central focuses, throughout his career, has been his commitment to his students, both graduate and undergraduate. Bernard not only shared his knowledge with them, but he also wanted to give them the opportunity to grow as scientists and human beings. Younger colleagues also recall his reassuring presence as a mentor and an example of a true academic.

All those who have known Bernard have a deep respect for his scientific abilities and his numerous professional accomplishments, but they especially dearly remember the man who Bernard was: warm, smiling, and with an incomparable laughter. His hard-working attitude never was disjoint from his heart-felt, true respect of others; together with his renowned sense of humor, this made him a wonderful colleague to both have full-night work stints with, and share small talk about hockey or the history of Quebec over a beer. We will sorely miss him.

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