Curriculum vitae

Csaba I. Fábián
Professor, Department of Informatics, John von Neumann University.
Chair, Applied Informatics Research Lab, John von Neumann University.
Address: GAMF Faculty of Engineering and Computer Science
John von Neumann University
H-6000, Izsáki út 10, Kecskemét, Hungary.
Email: fabian.csaba@nje.hu

Qualifications

2021 DSc, Hungarian Academy of Sciences.
2020 habilitation, Doctoral School of Applied Informatics and Applied Mathematics, Óbuda University, Budapest, Hungary.
1999 PhD, Doctoral School in OR, Applied Maths and Stats, Eötvös Loránd University of Budapest.
1982 MSc (mathematics), Eötvös Loránd University.

Appointments and duties

2020- Chair of the Scientific Council of John von Neumann University.
2023- Member of the Habilitation Committee and Doctoral Council of John von Neumann University.

Professional experience

2008- Full professor, Dept. of Informatics, John von Neumann University (formerly Kecskemét College).
1992-2012 Assistant professor / Lecturer, Dept. of OR, Eötvös Loránd University.
1987-1992 Research associate, Computer Center, Eötvös Loránd University.
1982-1987 Database specialist, Hungarian State Office of Census.

Professional activities

Areas of interest: stochastic optimization and applications, also linear, nonlinear and integer optimization.

Papers published in refereed journals

- P. Glushko, C.I. Fábián, A. Koberstein. "An L-shaped method with strengthened lift-and-project cuts". *Computational Management Science* **19** (2022), 539-565.
- C.I. Fábián. "Gaining traction: on the convergence of an inner approximation scheme for probability maximization". *Central European Journal of Operations Research* **29** (2021), 491-519.
- C.I. Fábián, E. Csizmás, R. Drenyovszki, T. Vajnai, L. Kovács and T. Szántai. "A randomized method for handling a difficult function in a convex optimization problem, motivated by probabilistic programming". *Annals of Operations Research*, to appear in S.I.: Stochastic Modeling and Optimization, in memory of András Prékopa (E. Boros, M. Katehakis, A. Ruszczyński, editors).
- C.I. Fábián, E. Csizmás, R. Drenyovszki, W. van Ackooij, T. Vajnai, L. Kovács, and T. Szántai. "Probability maximization by inner approximation". *Acta Polytechnica Hungarica* **15** (2018), 105-125.
- T. Kovács, K. Bolla, R. Alvarez Gil, E. Csizmás, C. Fábián, L. Kovács, K. Medgyes, J. Osztényi, A. Végh. "Parameters of the intelligent driver model in signalized intersections". *Technical Gazette* **23** (2016), 1469-1474.
- C.I. Fábián, C. Wolf, A. Koberstein, L. Suhl. "Risk-averse optimization in two-stage stochastic models: computational aspects and a study". *SIAM Journal on Optimization* **25** (2015), 28-52.
- C. Wolf, C.I. Fábián, A. Koberstein, L. Suhl. "Applying oracles of on-demand accuracy in two-stage stochastic programming - a computational study". *European Journal of Operational Research* **239** (2014), 437-448.

- C.I. Fábián, K. Eretnek, and O. Papp. "A regularized simplex method". *Central European Journal of Operations Research* **23** (2015) 877-898.
- C.I. Fábián, O. Papp, and K. Eretnek. "Implementing the simplex method as a cutting-plane method, with a view to regularization". *Computational Optimization and Applications* **56** (2013), 343-368.
- V. Zverovich, C.I. Fábián, E.F.D. Ellison, and G. Mitra. "A computational study of a solver system for processing two-stage stochastic LPs with enhanced Benders decomposition". *Mathematical Programming Computation* **4** (2012), 211-238.
- C.I. Fábián, G. Mitra, D. Roman, and V. Zverovich. "An enhanced model for portfolio choice with SSD criteria: a constructive approach". *Quantitative Finance* **11** (2011), 1525-1534.
- C.I. Fábián, G. Mitra, and D. Roman. "Processing Second-order Stochastic Dominance models using cutting-plane representations". *Mathematical Programming* **130** (2011), 33-57.
- C.I. Fábián and A. Veszprémi. "Algorithms for handling CVaR-constraints in dynamic stochastic programming models with applications to finance". *The Journal of Risk* **10** (2008), 111-131.
- C.I. Fábián. "Handling CVaR objectives and constraints in two-stage stochastic models". *European Journal of Operational Research* **191** (2008), 888-911.
- C.I. Fábián and Z. Szőke. "Solving two-stage stochastic programming problems with level decomposition". *Computational Management Science* **4** (2007), 313-353.
- C.I. Fábián, A. Prékopa, and O. Ruf-Fiedler. "On a dual method for a specially structured linear programming problem". *Optimization Methods and Software* **17** (2002), 445-492.
- C.I. Fábián, R. Némedi, and Z. Szőke. "A stochastic programming model for optical fiber manufacturing". *Central European Journal of Operations Research* **9** (2001), 343-359.
- C.I. Fábián. "Bundle-type methods for inexact data". *Central European Journal of Operations Research* **8** (2000), 35-55.

Book chapter

- C.I. Fábián, G. Mitra, D. Roman, V. Zverovich, T. Vajnai, E. Csizmás, and O. Papp. "Portfolio choice models based on Second-order Stochastic Dominance measures: an overview and a computational study". In: *Stochastic Optimization Methods in Finance and Energy* (M.I. Bertocchi, G. Consigli, and M.A.H. Dempster, eds), 441-469. Vol. **163**, *International Series in Operations Research & Management Science*. Springer 2011.

Talks given by invitation

Plenaries:

- "On first-order methods in stochastic programming". MMEI, *Joint Czech-German-Slovak Conference on Mathematical Methods in Economy and Industry.* Jindřichův Hradec, Czech Republic, 2017.
- "On computational aspects of stochastic programming". CMS, *International Conference on Computational Management Science,* Salamanca, Spain, 2016.

Tutorial: VOCAL, *Veszprém Optimization Conference: Advanced Algorithms*, Veszprém, Hungary, 2014.

16 talks given in invited sessions at international scientific conferences. 4 invited talks at international workshops, including Brno University of Technology, Czech Republic, 2019.

12 seminar lectures, including: Charles University in Prague, 2019 and 2015; the Norwegian University of Science and Technology, Trondheim, 2015 and 2017; Institute of Information Theory and Automation of the Czech Academy of Sciences, Prague, 2015; University of Edinburgh, 2009; Brunel University London, 2008.

Working visit, RUTCOR, *Rutgers Center for Operations Research*, Rutgers University, New Brunswick, NJ, USA. In 1995, spent three months at the invitation of prof. András Prékopa, implementing a stochastic programming method of his. Also got involved in research into fiberglass cutting, jointly done by András and colleagues from the AT&T Bell Labs (later Lucent Technologies).

Visiting scholarship, Brunel University of West London, England. Between 2007 and 2010, spent a month yearly, collaborating with prof. Gautam Mitra and colleagues from CARISMA, *Centre for the Analysis of Risk and Optimisation Modelling Applications*. We developed special decomposition methods and cutting-plane approaches for the handling of risk constraints in stochastic programming problems. The models and solvers developed in course of these projects have been included in the optimization and risk analytics tools of OptiRisk Systems, an informatics and consulting company specializing in risk management, and utilizing the results of research done at Brunel University.

Research and development collaboration with professors Leena Suhl and Achim Koberstein, and colleagues form Paderborn University, Germany and Viadrina European University, Frankfurt/Oder, Germany. We integrated special approximation and regularization methods into the stochastic programming solver system developed at DSOR, *Decision Support & Operations Research Lab*, Paderborn University and IOM, *Department of Information and Operations Management*, the European University Viadrina. The extended system has been used to solve a real-life strategic problem, optimizing gas purchase of a utility company. The collaboration with professor Achim Koberstein goes on, presently dealing with integer stochastic programming.

Research and development projects at John von Neumann University

We investigate models of urban traffic and means of controlling traffic. We developed methods of determining traffic equilibria. Solutions are tested and compared using a microsimulator based on the Intelligent Driver Model, a time-continuous car-following model widely used in the simulation of urban traffic. (The microsimulator was implemented by colleagues from our research lab.)

We develop and implement methods for the solution of probabilistic problems, with a view to applications in the design of smart electric grids. We collaborate with the Data Analytics and Optimization Research Group of the Budapest University of Technology and Economics, Hungary.

In a recent project, we develop solution methods for facility layout problems.

Former R&D project

Designed and implemented a subroutine collection for interactive optimization. The library enabled effective implementation of special procedures. It had been integrated into diverse application systems:

- Large-scale simulation system built for the German Navy by IABG (*Industrieanlagen Betriebsgesellschaft mbH*, Ottobrunn/München, Germany; a major informatics and consulting company specializing in transportation, energy, and defense applications).
- Chemical engineering systems built at the University of Pannonia, Veszprém, Hungary.
- Pavement management system, used by the Hungarian Ministry of Transportation for the allocation of financial resources to maintenance and reconstruction works.

Teaching, bachelor and master levels

BSc courses given at John von Neumann University: *Optimization methods, Probability and Statistics, Optimization and simulation, Decision making under uncertainty, Enterprise Resource Planning, Database Management Systems*.

MSc courses formerly given at the Eötvös Loránd University: *Introduction to OR, OR software, Linear and nonlinear programming, Stochastic programming, Risk management*.

Teaching, doctoral level

In 2023, a new doctoral school was founded at John von Neumann University, in the field of Management and Business Administration. I give courses titled *Research and Decision Methodology – Quantitative Methods* and *Resource Planning: Models and Case Studies*.

Since 2012, regularly give courses in *Stochastic programming* at the Doctoral School of Information Science, University of Pannonia, Veszprém, Hungary. Before 2012, gave stochastic programming-related courses at the Doctoral School in Mathematics, Eötvös Loránd University, through many semesters.

Advisor to the PhD theses of Christian Wolf, Paderborn University, Germany, 2012-2013; and Márton Frits, University of Pannonia, 2012-2022.

Ongoing collaboration with doctoral students and their advisors at John von Neumann University and the European University Viadrina Frankfurt(Oder). In the years 2007-2010, collaborated with doctoral students and their advisors at Brunel University.

Guest lecturer, Norwegian University of Science and Technology, Trondheim. In the fall semesters of 2015 and 2017, presented modules of the *Stochastic Optimization* course in the *Industrial Economics and Technology Management* doctoral program, in intensive form.

Invited lecturer at winter school and doctoral workshops

- *PhD Winter School on Stochastic Programming with Applications in Energy, Finance and Insurance.* Bad Hofgastein, Austria, 2014.
- *DSOR / CARISMA Workshops on Optimisation Methods and Business Applications.* Paderborn University, Germany, 2009 and 2010. (Approved by VHB, *German Academic Association for Business Research*).

Service to professional community

Membership to professional organizations

- Stochastic Programming Society (SPS), a technical section of the Mathematical Optimization Society.
- EURO Working Group on Stochastic Optimization (EWGSO). Played an active role in creating EWGSO, and making it an operational working group.
- Public body of the Hungarian Academy of Sciences.
- Hungarian OR Society, a member society of EURO.

Membership in elected professional bodies

- Committee on Stochastic Programming (COSP), the governing board of SPS. Elected for the 3-year terms between 2010-2016.
- Managing Board of EWGSO; elected for the 3-year terms between 2013-2025. Chair 2013-2016, coordinator since 2016.
- Committee on Operational Research, a scientific committee of the Section of Mathematics of the Hungarian Academy of Sciences. Elected for the 3-year terms between 2011-2026. Secretary 2011-2017, vice chair since 2021.
- Managing Board of the Hungarian OR Society; elected for the 3-year terms between 2011-2017 and 2020-2023. Vice president 2011-2014.

Editorship

- Member of the Editorial Board, *Annals of Operations Research*; since 2019.
- Section Editor (Computer Science), *Gradus*, the journal of John von Neumann University; since 2015.
- Guest Editor, *Computational Management Science,* special cluster on Stochastic Programming, in volume **12** (2015).

Conference organization
Member of the Program Committee or the Scientific Committee of these conferences:

- ICSP (*Intl Conf on Stochastic Programming*) 2013, 2019;
- VOCAL (*Optimization Conf: Advanced Algorithms*) 2014, 2016, 2018, 2021, 2024;
- CMS (*Intl Conf on Computational Management Science*) 2010, 2017;
- ECSO (*European Conference on Stochastic Optimization*) 2017;
- ECSO-CMS (*European Conference on Stochastic Optimization and Computational Management Science*) 2024;
- APMOD (*Intl Conf on Applied Mathematical Optimization and Modelling*) 2012, 2014, 2016;
- ECSP (*EURO Mini-Conf on Stochastic Programming*) 2014.

Organized 13 invited sessions and a minisymposium at these conferences, and co-organized two invited streams.

Participation in academic qualification procedures
Opponent in a DSc procedure (Doctor of the Hungarian Academy of Sciences).
Opponent in 2 habilitation procedures, Charles University of Prague, Czech Republic.
Opponent in 7 PhD procedures, at different Hungarian Doctoral Schools, at Paderborn University, Germany, and at the Brno University of Technology, Czech Republic.
Committee member in 12 PhD procedures at different Hungarian Doctoral Schools.

Participation in the evaluation of funding applications
External reviewer for the Czech Science Foundation, 2017.
External reviewer for the Finnish Academy, Research Council for Natural Sciences and Engineering, 2017.

Reviewing
During the years 2010-2020, reviewed about ten papers yearly, for scientific journals, including *Annals of Operations Research, Computers and Operations Research, European Journal of Operational Research, Mathematical Programming, Mathematical Programming Computation, Operations Research, SIAM Journal on Optimization.*