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Résumé

Jean-Philippe Vial est Ingénieur des Arts et Manufactures (Ecole Centrale de Paris, 1964). Il a obtenu un master in industrial engineering (University of Michigan, 1967), un doctorat en Recherche Opérationnelle (université catholique de Louvain, 1970) et un doctorat d'état en Mathématiques (Université Paris-Dauphine, 1985).

Il a commencé sa carrière universitaire à l'université catholique de Louvain, comme assistant en recherche opérationnelle (1967-70) et comme chercheur junior au CORE (Center for Operations Research and Econometrics, Louvain, Belgique). Il a poursuivi sa carrière à l'université catholique de Louvain et au CORE (1970-86) puis à l'université de Genève (section des Hautes Etudes Commerciales de la faculté des sciences économiques et sociales de l'université de Genève, Suisse) où il a enseigné les méthodes quantitatives de gestion et la logistique de production en tant que professeur ordinaire (1986-2006). Depuis 2006 il est professeur honoraire l'université de Genève.

Durant sa carrière, il a occupé des postes de direction de département (Mathématiques Appliquées, université de Louvain 1981-1982, Université de Genève, 1986-1989). Il a été professeur invité à la graduate school of management, University of California, Berkeley (1972-74 et 1981), à l'université Louis Pasteur, Strasbourg (1984-1986) et pour de plus brefs séjours au Technion, Haifa, à l'université Paris-Dauphine, à l'université Paul Sabatier (Toulouse), à la Technical University Delft (Pays-Bas). Avec Alain Haurie il a créé le laboratoire de recherche Logilab qu'il a animé jusqu'en 2006.

Il a enseigné la gestion de production et la recherche opérationnelle dans les programmes de licence, de diplôme et de formation continue de l'université de Genève. Il a dirigé plusieurs projets de recherche, portant principalement sur les méthodes d'optimisation convexe et sur l'optimisation convexe ainsi que sur les applications dans les télécommunications et dans l'analyse des choix énergétiques et environnementaux. Il a dirigé des thèses à l'université catholique de Louvain (2 thèses) et l'université de Genève (9 thèses).

En 2002 il a participé à la création de la société de conseil et d'étude ORDECSYS basée à Genève qui est spécialisée dans les domaines de la logistique, du calcul scientifique et de la modélisation technico-économique et environnementale. En 2005 il a participé à la création de la société C-ORDEE spécialisée dans les analyses économiques et systémiques de l'environnement. Actuellement son activité se concentre sur le développement de ces deux sociétés.

Nominations honorifiques

- President of the Mathematical Programming Society, 1998-2001.
- Vice-President of the Mathematical Programming Society, 1997 et 2002-2003.

Editeur de revues scientifiques

- Associate Editor of Management Science
- Associate Editor of Mathematical Methods for Operations Research

Direction de projets de recherche

- *Stochastic programming with linear decision rules*, FNRS 100012-105309 / 1, October 2004 to October 2006, CHF. 163'000.
- *An advanced computational tool for variational inequalities and branch and cut approaches in combinatorial optimization*, FNRS 1214-57093.99, April 2000 to April 2003 1999, CHF. 503'221.
- *Management of new services*, CNET, France-Telecom, 1 year, 1998-1999, CHF.125'000.
- *Nonlinear solver for large-scale programming and the solution of MARKAL-Macro models*, Paul Scherer Institute, (1997-2000), CHF. 50'000.
- *Interprétation de techniques de décomposition dans les langages de modélisation* FNRS, grant 1214-049696.96/1, April 1997, co-investigator (main investigator: Emmanuel Fragnière).
- *Parallel computing for risk management and long term strategic planning*, FNRS 1214-042503.94, October 1995 to March 1999, CHF. 395'734.
- *Technique de décomposition dans l'analyse des choix énergétiques et environnementaux*, Paul Scherer Institute, (1992-1994), CHF. 50'000.
- *Applications des méthodes de points intérieurs aux problèmes de réseaux de télécommunications*, CNET, France-Telecom, 2 years 1993-1995, CHF.150'000.
- *Méthode de points intérieurs pour la programmation linéaire et la programmation convexe: application à la programmation stochastique*, co-investigator: A. Haurie, FNRS 12-34002.92, 3 years 1992-1995, CHF. 396'299.
- *Algorithme projectif et décomposition: Application à des modèles de programmation stochastique utilisés en planification*, FNRS grant 12-26434.89, co-investigator A. Haurie, 313'803 CHF, 3 years 1989-1992.
- *Méthode projective en programmation linéaire*; FNRS grant 1.467-0.86, 160'000 CHF, 2 years, 1987-1989.

Livres, articles et chapitres de livres (seulement ceux parus depuis 1985)

Livres

C. Roos, T. Terlaky, and J.-Ph. Vial. Theory and Algorithms for Linear Optimization. John Wiley and Sons, New York, 1997.
C. Roos, T. Terlaky, and J.-Ph. Vial. Interior Point Methods for Linear Optimization. 2nd edition, Springer, 2006.

Articles

1. Drouet, L., Haurie, A., Moresino, F., Vial, J.-P., Vielle, M., and Viguier, L. An oracle based method to compute a coupled equilibrium in a model of international climate policy. Tech. rep., Ordecsys, Place de l'Etrier, 4, CH-1224, Chêne-Bougeries, Switzerland, 2007 (to appear in *Computational Management Science*).

2. F. Babonneau and J.-P. Vial. ACCPM with a nonlinear constraint and an active set strategy to solve nonlinear multicommodity flow problems. Technical report, HEC/Logilab, University of Geneva, 40 Bd du Pont d'Arve, CH-1211, 2005. To appear in *Mathematical Programming*.
3. Babonneau, F., and Vial, J.-P. An efficient method to compute traffic assignment problems with elastic demands. Technical Report (to appear in *Transportation Science*), Logilab, Department of Management Studies, University of Geneva, 40 Bd du Pont d'Arve, CH-1211, Switzerland, 2006.
4. Nesterov Yu. and Vial J.-Ph., Confidence level solutions for stochastic programming, Logilab Technical Report, Department of Management Studies, University of Geneva, Switzerland, January, 2000, revised 2006, To appear in *Automatica*.
5. Thénié, J., and Vial, J.-P. Step decision rules for multistage stochastic programming: a heuristic approach. Technical report, HEC/Logilab, University of Geneva, 40 Bd du Pont d'Arve, CH-1211, Switzerland, 2006. To appear in *Automatica*.
6. O. Bahn, L. Drouet, N. Edwards, A. Haurie, R. Knutti, S. Kypreos, T.F.Stocker, and J.-P. Vial. The coupling of optimal economic growth and climate models. In R. Röthlisberger H. Wanner, M. Grosjean and E. Xoplak, editors, *Climate Variability, Predictability and Climate Risks: A European Perspective*. Climatic Change, 2006.
7. F. Babonneau, C. Beltran, A. Haurie, C. Tadonki, and J.-P. Vial. Proximal-ACCPM: a versatile oracle based optimization method. In E. J. Kontoghiorghes, editor, *Optimisation, Econometric and Financial Analysis,* volume 9 of *Advances in Computational Management Science*. Springer Verlag, 2006.
8. F. Babonneau, O. du Merle, and J.-P. Vial. Solving large scale linear multicommodity flow problems with an active set strategy and Proximal-ACCPM. *Operations Research,* 54(1):184–197, 2006.
9. C. Beltran, N.R. Edwards, A.B. Haurie, J.-P. Vial, and D.S. Zachary. Oracle-based optimization applied to climate model calibration. *Environmental Modeling and Assessment,* 11(1):31–43, 2006.
10. C. Beltran, C. Tadonki, and J.-P. Vial. Solving the p-median problem with a semi-Lagrangian relaxation. *Computational Optimization and Applications,* (35), 2006.
11. J. Thénié, C. van Delft, and J.-P. Vial. Automatic formulation of stochastic programs via an algebraic modeling language. *Computational Management Science,* pages 1–24, 2006.
12. C. Beltran, L. Drouet, N.R. Edwards, A. Haurie, J.-P. Vial, and D.S Zachary. An oracle method to couple climate and economic dynamics. In A. Haurie and L. Viguier, editors, *The Coupling of Climate and Economic Dynamics*, chapter 3. Springer, 2005.
13. Ben-Tal, B. Golany, A. Nemirovski, and J.-Ph. Vial. Supplier-retailer flexible commitments contracts: A robust optimization approach. *Manufacturing Services and Operations Management,* 7:248–271, 2005.
14. D. Carlson, A. Haurie, J.-P. Vial, and D.S. Zachary. Large-scale convex optimization methods for air quality assessment. *Automatica,* 40:385–395, 2004.
15. Y. Nesterov and J.-Ph Vial. Augmented self-concordant barriers and nonlinear optimization problems with finite complexity. *Mathematical Progamming,* 99:149–174, 2004.
16. C. Tadonki and J.-Ph.Vial. Efficient algorithm for linear pattern separation. In M. Bubak, G.D. van Albada, P.M.A. Sloot, and J.J. Dongarra, editors, *Computational Science - ICCS 2004: 4th International Conference, Kraków, Poland, June 6-9, 2004*, *Proceedings, Part I, Lecture Notes in Computer Scienc*e, pages 679 – 682. Springer-Verlag GmbH, 2004.
17. Ch. van Delft and J.-P. Vial. A practical implementation of stochastic programming: an application to the evaluation of option contracts in supply chains. *Automatica,* 40:743–756, 2004.
18. O. Péton and J.-P. Vial. Multiple cuts with the homogeneous analytic center cutting plane method. *Computational Optimization and Applications*, 24:27–61, 2003.
19. J. Filar, A. Haurie, F. Moresino, and J.-P. Vial. Singularly perturbed hybrid systems approximated by structured linear programs. In Z. Hou, J. Filar, and A. Chen, editors, *Markov Processes and Controlled Markov Chains*. Kluwer, Dordrecht, 2002.
20. J.-L. Goffin and J.-P. Vial. Convex nondifferentiable optimization: A survey focussed on the analytic center cutting plane method. *Optimization Methods and Software,* 17(805-867), 2002.
21. L. M. Nicoletti, G. Stauffer, and J.-P. Vial. An industrial cutting stock problem. In M. Breton and G. Zaccour, editors, *Decision and Control in Management Science*. Kluwer, 2002.
22. J. Gondzio, R. Sarkissian, and J.-P. Vial. Parallel implementation of a central decomposition method for solving large-scale planning problems. *Computational Optimization and Applications*, 19:5–29, 2001.

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54. O. Bahn, A. Haurie, S. Kypreos, and J.-P. Vial. A decomposition approach to multiregional environmental planning: a numerical study. In C. Carraro and A. Haurie, editors, *Operations Research and Environmental Management*, pages 119–132. Kluwer Academic Publisher, The Netherlands, 1994.
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56. J.-L. Goffin and J.-P. Vial. Short steps with Karmarkar's projective algorithm for linear programming. *SIAM Journal on Optimization*, 4:193–207, 1994.
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58. C. Roos and J.-P. Vial. Achievable potential reductions in the method of Kojima and al. in the case of linear programming. *RAIRO*, 28:123–133, 1994.
59. J.-P. Vial. Computational experience with a primal–dual interior-point method for smooth convex programming. *Optimization Methods and Software*, 3:285–316, 1994.
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61. J.-L. Goffin and J.-P. Vial. On the computation of weighted analytic centers and dual ellipsoids with the projective algorithm. *Mathematical Programming*, 60:81–92, 1993.
62. B. Jansen, C. Roos, T. Terlaky, and J.-P. Vial. Interior-point methodology for linear programming: duality, sensitivity analysis and computational aspects. In K. Frauendorfer, H. Glavitsch, and R. Bacher, editors, *Optimization in Planning and Operation of Electric Power Systems, Lecture Notes of the SVOR/ASRO Tutoria*l (Thun, Switzerland, October 14-16, 1992), pages 57–123. Physica-Verlag, Heidelberg, 1993.
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Rapports de recherche

1. Beltran-Royo, C., J.-P. Vial, and Alonso-Ayuso, A. Solving the uncapacitated facility location problem with semi-lagrangian relaxation. Working paper, Statistics and Operations Research, Rey Juan Carlos University, Madrid, Spain, 2007. Submitted to *Operations Research*.
2. O. Péton, N. Sawhney, and J.-P. Vial. Linear and nonlinear discrimination via the analytic center cutting plane method. Technical report, Hec/Logilab, University of Geneva, 40 bd du Pont d'Arve, CH-1211 Geneva 4, Switzerland, 2005.
3. R. Apparigliato, J.-P. Vial, and R. Zorgati, Optimisation robuste linéaire. Application; Gestion à court terme d'une vallée hydraulique, Rapport de recherche H-R32-2006-04804-FR, EDF R&D, Dépt OSIRIS, 1 Av. Général de Gaulle, 92141 Clamart, Cedex, France, 2007.
4. J.-P. Vial and R. Apparigliato, Optimisation robuste linéaire: une introduction, rapport de recherche, EDF R&D OSIRIS, 1 Av. Général de Gaulle, 92141 Clamart, Cedex, France, 2007.
5. Dubois, J. Thénié, and J.-P. Vial, Stochastic programming: the det2sto tool, tech. rep., 2005. Downladable file at http://www.ordecsys.com/det2sto/ .

Livres édités

- J.-L. Goffin and J.-Ph. Vial, editors. Nondifferentiable and Large Scale Optimization. Number 69 in *Mathematical Programming* B. North-Holland, Amsterdam, The Netherlands, 1995.

- C. Roos and J.-Ph. Vial, editors. Interior Point Methods for Linear Programming: Theory and Practice. Number 52 in *Mathematical Programming* B. North-Holland, Amsterdam, The Netherlands, 1991.
- B. Cornet, Nguyen v. Hien, and J.-Ph. Vial, editors. Nonlinear Analysis and Optimization. *Mathematical Programming Study*. North-Holland, Amsterdam, The Netherlands, 1987.

Logiciels

- *OBOE*: OBOE (Oracle Base Optimization Engine) est un logiciel d'optimisation pour les problèmes convexes non-différentiables que l'on peut approximer à l'aide de plans coupants produits par un oracle. Le moteur de l'optimisation est la méthode ACCPM (analytic center cutting plane method). Le logiciel est disponible sur le site COIN-OR à l'adresse https://projects.coin-or.org/OBOE/
- *DET2STO;* DET2STO est un script permettant de générer automatiquement le modèle AMPL de l'équivalent déterministe en programmation stochastique. Les inputs sont la version déterministe du modèle écrit en AMPL et la description standard de l'incertitude permettant de générer l'arbre d'événements. Le script est disponible à l'adresse http://www.ordecsys.com/det2sto/
- *NEATWOK:* NEATWORK est un logiciel d'aide à la conception de réseaux de distribution d'eau potable par gravité. Neatwork dimensionne le réseau à un coût minimum et simule son fonctionnement dans des conditions variables d'utilisation. Neatwork a été développé conjointement avec l'organisation non gouvernementale Agua Para La Vida qui opère au Nicaragua. NeatWork est distribué librement sur les sites http://www.ordecsys.com/neatwork/ et http://www.aplv.org/ .

Conférences

Jean-Philippe Vial a participé à de nombreuses conférences scientifiques. Il a organisé et a été sur le comité d'organisation de nombreuses manifestations scientifiques internationales sur l'optimisation.