

Short Biography of Gilles G. Patry, Executive Director The U15 Group of Canadian Research Universities

On October 1, 2017, Dr. Gilles G. Patry became Executive Director of the U15 Group of Canadian Research Universities (www.u15.ca). The U15's mandate is to foster the development and delivery of long-term, sustainable higher education and research policy, in Canada and around the world.



Prior to joining the U15, Dr. Patry was President and CEO of the Canada Foundation for Innovation (CFI) between 2010 and 2017 (www.innovation.ca). The CFI's mandate is to foster world-class research through investments in state-of-the-art research infrastructure.

Dr. Patry holds a B.A.Sc. and M.A.Sc. in civil engineering from the University of Ottawa, and a Ph.D. in civil engineering from the University of California, Davis. He was an environmental engineering consultant (1971-78) before becoming professor of civil engineering at École Polytechnique de Montréal (1978-83) and then at McMaster University in Hamilton, Ont. (1983-93).

Dr. Patry's research program at McMaster led him to develop an innovative modelling concept for the simulation of wastewater treatment plant dynamics (GPS-X™¹), and ultimately, to launch a Hamilton-based international consulting company, Hydromantis, Inc. (www.hydromantis.com). As founding President and Director of the company until June 2001, Dr. Patry was a key driver in the development and application of modelling and simulation concepts to the wastewater industry². Between 1993 and 2000, the company also operated out of the United Kingdom under the name Cambridge Control Hydromantis Ltd, in partnership with Motherwell Bridge Works of Scotland. Today, Hydromantis Environmental Software Solutions, Inc. is an employee-owned consulting engineering company with clients around the world.

Dr. Patry was Dean of the Faculty of Engineering from 1993 to 1997 and Vice-Rector (Academic) from 1997 to 2001 at the University of Ottawa. In his capacity as Dean of Engineering, he was instrumental in the creation of the School of Information Technology and Engineering (SITE) in the Faculty of Engineering designed to provide leading-edge information technology research and education at the University of Ottawa. As Vice-Rector (Academic), he fostered the expansion of the cooperative education program, the creation of new

¹ More than 25 years later, **GPS-X™** remains the flagship software in the industry.

² His paper "Dynamic Modelling of the Clarification-Thickening Process" published in 1991 was recognized in March 2006 as one of the 10 most significant groundbreaking papers in the 40-year publication history of **Water Research**, the premier scientific journals in water research (Impact Factor: 7.1). To date, the paper has been cited more than 1300 times. His top 5 papers have been cited more than 2900 times.

institutes, new academic programs, and new partnerships between the private sector, government, and other post-secondary academic institutions.

In 2002, he was elected Fellow of the Canadian Academy of Engineering. In 2004, he was named Executive of the Year by the *Regroupement des gens d'affaires* of the National Capital Region. Dr. Patry holds honorary doctorates from the University of Waterloo (2008), McMaster University (2009), INSA-Lyon (2016), Western University (2017), Carleton University (2018), University of Ottawa (2021) and McGill University (2021).

In 2009, he was named « *Chevalier de l'Ordre de la Pléiade* » of the « *Assemblée parlementaire de la francophonie* ». In 2010, he was appointed a Member of the Order of Canada. In 2011, Dr. Patry was appointed to the Order of Ontario (O.Ont.). He is the recipient of the 2002 Queen Elizabeth II Golden Jubilee Medal and of the 2012 Queen Elizabeth II Diamond Jubilee Medal. In May 2016 he was recognized by McMaster University's Faculty of Engineering for his exceptional leadership and received the 2016 Applause and Accolades Leadership Award.

As President of the Canada Foundation for Innovation (August 1, 2010 to July 31, 2017)

As President of the Canada Foundation for Innovation (CFI), Dr. Patry worked with universities, colleges, and research hospitals across the country to support high-quality research through research infrastructure funding. Through his efforts, governments now recognize that “*world-class research requires that you have access to state-of-the-art research facilities*”.

In 2011, Dr. Patry led the development of the **2012-2017 CFI Strategic Roadmap** that focuses on six (6) strategic directions:

- Invest in the highest level of excellence
- Sustain and enhance Canada's research capacity
- Forge productive partnerships
- Build global influence
- Establish a trusted voice
- Track impacts

These have resonated well with institutions and governments. In fact, as a result of these efforts, the Government of Canada invested \$1.330 billion in support of the Canada Foundation for Innovation as part of the 2015 Federal Budget – the largest single investment in the history of the CFI. Because of the 40-60 CFI funding formula, this investment will support close to \$3.0 billion of research infrastructure, including operational support.

In fact, the CFI has long recognized the need to provide funding to support the operational costs of research infrastructure. The Infrastructure Operating Fund (I OF), launched in 2001, provides a one-time investment equal to 30% of the value of the CFI capital contribution. This supplement is used for the initial operational costs of the funded research infrastructure. Within the CFI's 40:60 matching fund formula, this represents 12% of the value of the project,

or roughly equal to one year of operation, which is typically estimated at approximately 15% of the capital investment. Recognizing the need to address the operational costs of national research facilities, in 2012 the CFI launched the Major Sciences Initiative (MSI) Fund, financed at the rate of \$37.5 million per year. The program was expanded in 2014 to \$45 million per year, and again in 2017 to \$80 million per year. By 2017, the program supported close to 20 national facilities across the country. His efforts focused on broadening the operational financial support for national, regional and core institutional research facilities.

In an effort to influence policies, Dr. Patry has published many opinion pieces (Op-Ed) in newspapers across the country, including the Globe and Mail, the Ottawa Citizen, the Toronto Star and the Hill Times, as well as several trade journals.

CFI is recognized nationally and internationally for its exceptional contributions to research infrastructure funding.

As President of the University of Ottawa (August 15, 2001 to June 30, 2008)

Located in the heart of the National Capital, a short distance from some of our major national institutions, the University of Ottawa is an exceptional institution. More than 35,500 students live in a dynamic research-intensive environment, characterized by an exceptional cultural and scientific setting (Library Archives Canada, National Research Council, national museums, embassies and foreign cultural services, etc.) where creativity and innovation flourish. As a research-intensive university, the University of Ottawa consistently ranks among the top 10 Canadian research universities.

Here are some of the highlights of Dr. Patry achievements as President and Vice-Chancellor of the University of Ottawa:

- Lead the development of the University's strategic plan – *Vision 2010*.
- *Vision 2010* defines the institution's vision, directions and objectives and including a number of strategic initiatives. As part of this plan, the university introduced a "balanced scorecard approach" as a way of translating the University's vision, directions and objectives into clear and measurable elements, emphasizing what is most important to the institution, disseminating this information to the entire University community, and measuring the impact of the proposed initiatives.
<http://web5.uottawa.ca/vision2010/home.html>
- Operating budget grew from \$334 millions in 2001 to \$619 millions in 2007 (expected to reach \$670 millions in 2008)
- Hired more than 740 faculty members from 2001 to 2007
- Research funding grew from \$115 millions in 2000-2001 to \$248 millions in 2006-2007
- Student population grew from 25,400 in 2001 to 35,600 in 2007
- Promoted the development of multidisciplinary initiatives including academic programs, research centres and institutes.
- Spearheaded the 2nd fundraising campaign in the history of the University of Ottawa with a goal of \$200 million dollars. Surpassed the \$200 million goal one year ahead of schedule by raising a record \$226 million by May 2007.

- Raised more than \$50 million in 2006-2007
- Recorded the largest donation ever to a business school in Canada through the generous support of alumnus Ian Telfer who donated \$25 million to the School of Management (Telfer School of Management at the University of Ottawa).
- That same year, alumnus and Canadian business leader Paul Desmarais Sr. donated \$15 million to his alma mater.
- Led more than \$300 million of capital investments on campus, including:
 - School of Information Technology and Engineering (\$60M)
 - Health research wing at Roger Guindon campus (\$60M)
 - Desmarais Building (\$80M)
 - Biosciences Complex (\$60M)
 - Hyman Soloway Residence (\$25M)
 - Acquisition of the former Algonquin College Campus (\$7.5M)
 - Acquisition of the Ottawa Life Science Campus (\$7.5M)
- In February 2007, Patry announced the launch of a \$150-million academic infrastructure plan, including the construction of a new building for the Faculty of Social Sciences.

CURRICULUM VITAE

a) NAME

PATRY, Gilles G., Professor Emeritus and President Emeritus, University of Ottawa

E-mail: Gilles.Patry@rogers.com

Cell. [REDACTED]

Security Clearance (Federal Government): Level II (Secret)

Date of birth: [REDACTED]

[REDACTED]

[REDACTED]

Languages: Fluent in French, English and Spanish

b) DEGREES

Ph.D. Civil Engineering, University of California, Davis, 1983

M.A.Sc. Civil Engineering, University of Ottawa, 1973

B.A.Sc. Civil Engineering, University of Ottawa, 1971

c) EMPLOYMENT HISTORY

2017-date Executive Director, The U15 Group of Canadian Research Universities
 2010-2017 President and CEO, Canada Foundation for Innovation
 2009 Visiting Scholar, Georgia Institute of Technology, Atlanta, GA (Jan-April)
 2008-2010 Professor and President Emeritus - Administrative and research leave
 2001-2008 Professor, President and Vice-Chancellor, University of Ottawa
 1997-2001 Professor and Vice-President (Academic), University of Ottawa
 1993-1997 Professor and Dean of the Faculty of Engineering, University of Ottawa
 1993-1998 Adjunct Professor, School of Geology and Geography, McMaster University
 1991-1993 On leave from McMaster University (Hydromantis, Inc.)
 1988-1993 Professor, McMaster University, Dept. of Civil Engineering
 1985-2001 Director of Hydromantis, Inc. Founder and President (1985-1993)
 1983-1988 Associate Professor, McMaster University, Dept. of Civil Engineering
 1978-1983 Assistant Professor, École Polytechnique de Montréal, Dept. of Civil Eng'g
 1971-1978 Bessette, Crevier, Parent, Tanguay & Associés, Consulting Engineers
 (1971-74: Hull, QC; 1974-78: Montréal, QC)

d) HONOURS AND AWARDS (SINCE 1987)

2021 Honorary Doctorate (D.Sc.) (Faculty of Engineering), McGill University
 2021 Honorary Doctorate (D.U.) (Faculty of Engineering), University of Ottawa
 2018 Honorary Doctorate (LL.D.) (Faculty of Science), Carleton University
 2017 Honorary Doctorate (LL.D.) (Faculty of Engineering), Western University

- 2016 *Doctorat Honoris Causa*, Université de Lyon, INSA-Lyon (Nov. 2016)
- 2016 **2016 Applause and Accolades Leadership Award** – McMaster University, Faculty of Engineering (May 2016)
- 2014 Recipient of the **Meritas Tabaret Award**, University of Ottawa
- 2012 Recipient of the Queen Elizabeth II Diamond Jubilee Medal, May 2012
- 2011 Appointed to the Order of Ontario (O.Ont.), Jan. 2011
- 2010 Appointed Professor Emeritus, Faculty of Engineering, University of Ottawa
- 2010 Appointed Member of the Order of Canada (C.M.), July 2010
- 2009 United Way Ottawa – Community Builder Award, October 2009
- 2009 26th John W. Hodgins Memorial Lecture Award, McMaster University, Oct. 2009
- 2009 Honorary Degree, D.Sc. (Hon.), Faculty of Engineering, McMaster University, June 12, 2009
- 2009 Recipient of the title « *Chevalier de l'Ordre de la Pléiade* » from the « *Assemblée parlementaire de la francophonie* »
- 2008 Alumnus of the Year Award, Faculty of Engineering, University of Ottawa
- 2008 Appointed President Emeritus, Board of Governors, University of Ottawa, Nov. 2008
- 2008 Honorary Degree, LL.D. (Hon.), Faculty of Engineering, University of Waterloo, June 14, 2008
- 2007 Recipient of the Centre Jacques Cartier Medal (Lyon, France)
- 2006 Water Research Award. Co-author of paper selected as one of the 10 most significant groundbreaking papers in the 40-year history of **Water Research**.³ (As of July 2016, cited more than 920 times)
- 2004 Executive of the Year – Public Sector (*Regroupement des gens d'affaires de la Capitale nationale*)
- 2002 Elected Fellow of the Canadian Academy of Engineering – FCAE
- 2002 Recipient of the Queen Elizabeth II Golden Jubilee Medal
- 1999 Conference Board of Canada – Chrysler Award – Ottawa Venture in Training of Engineers and Scientists in Software Engineering (O-Vitesse) – (A. Chhatbar, A. Carty - NRC, J. ApSimon - Carleton University, G. Patry - University of Ottawa)
- 1998 Canadian Council for the Advancement of Education (CCAEE) – Best private partnership – Bronze - School of Information Technology and Engineering (SITE) (G.G. Patry, T. Aboulnasr, E. Petriu and R. Probert)
- 1987 Best Research Paper – ASCE, **Journal of Water Resources Planning and Management** – American Society for Civil Engineers

e) PROFESSIONAL AND SCHOLARLY ACTIVITIES (SINCE 1987)

- 2020-present Chair, Department Audit Committee, Fisheries and Oceans Canada (DFO)
- 2018-present Member, Board of Directors, Royal Canadian Mint
- 2018-2021 Member, Scientific Advisory Committee, Council of Canadian Academies

³ Award Winning Paper: Takács, I., Patry, G.G. and Nolasco, D. (1991). Dynamic Modelling of the Clarification-Thickening Process. **Water Research**. **25**(10):1263-1271. Dr. Imre Takács was post-doctoral fellow, while Daniel Nolasco was a master's student.

2017-2018 Member, Review panel, Genome Canada

2013-2019 Member and Vice-President, Board of Directors CCC256

2013-2015 Member, *Conseil d'orientation stratégique et scientifique*, Centre Jacques Cartier, Lyon, France

2012-2013 Member of the Higher Education Quality Council of Ontario (HEQCO) to review the **Strategic Mandate Agreements** for the Minister of Training, Colleges and Universities

2012 Invited as an expert by the Ministry of Education, Chile to review the technology transfer and innovation submissions by Chilean universities - **Convenios de Desempeño para Innovación en Educación Superior (CD InES)**

2011-2012 Canadian Nuclear Safety Commission (CNSC). Member of the External Advisory Committee Examining the Response of the Canadian Nuclear Safety Commission to the 2011 Japanese Nuclear Event

2011 *Président. Comité d'experts pour la Phase IV du Consortium national de formation en santé*

2008-2010 Member, Advisory Board, The Water Institute, University of Waterloo

2009-2010 Member of the Advisory Board, Canadian Research Knowledge Network

2009-2010 Member of the Board, Canadian Water Network – Réseau canadien de l'eau

2008-2009 Review of the Pierre Elliott Trudeau Foundation. Report co-authored with William Leggett and Elizabeth Dowdeswell.

2008-2010 Appointed by Treasury Board to Audit Committee, National Research Council of Canada

2006-2010 Member of the Board, Canadian Merit Scholarship Foundation (CMSF)

2007-2008 Member of *The Ottawa Partnership* (TOP)

2006-2008 Member of the Ontario Research and Innovation Council, Ministry of Research and Innovation, Ontario

2006-2008 Member of the Board, «*Regroupement des gens d'affaires de la région de la Capitale nationale* »

2005-2010 Member of the Board, Ontario Centres of Excellence Inc.

2004-2006 Member, The Ottawa Partnership (TOP)

2002-2008 Member, Council, National Research Council of Canada
Member of the Audit Committee

2002-2008 Member of the Board of OCRI (Ottawa Centre for Research and Innovation) (and of the Executive Committee 2004-2006)

2001-2008 Member of the Board of the University of Ottawa Heart Institute

2002-2004 Member of the Board, British Columbia Freshwater Institute (BCFI)

2001-2005 Associate Editor – **Journal of Environmental Engineering and Science**

1999-2004 Member of the Board of Directors of Vitesse Re-Skilling Canada Inc.

1999-2002 Member of "The Ottawa Partnership (TOP)"

1998-2002 NSERC – Member Committee on Research Partnerships (CRP)

1999-2001 AECL – Member of the Research and Development Committee

1998-1999 NSERC – Member of the IOF Review Committee

1998 NSERC – Review of Research Grant Appeals
1998-2001 NCE - Member of Research Program Committee – Sustainable Forest Management Centre of Excellence.
1997 Program appraisal – Université de Sherbrooke
1996 External reviewer – Civil Eng’g Program – University of Western Ontario
1995 NSERC – Review of Research Grant Appeals (Civil, Mechanical, Ind & Chem. Eng.)
1995 External evaluator – Graduate Program Civil Eng’g – Université Laval
1995-1999 Member, Board of Directors of OCRINet
1994-1998 Member, Board of Directors of TRIO
1994 Canadian Engineering Accreditation Board, Vice-Chair (Université Laval)
1994 Canadian Engineering Accreditation Board, Vice-Chair (Ryerson Polytechnic University)
1994 External evaluator – Graduate Program in Civil Engineering, École Polytechnique de Montréal
1994 NSERC–Review of Research Grant Appeals (Civil, Mech, Ind & Chem. Eng.)
1994 Member, NSERC Collaborative Projects Grant Committee
1994 Member, Review panel for PRIMTAF - COGESULT
1993-2001 Member of the Board of Hydromantis Holding Inc.
1991 Member, U.S. EPA Review Panel for the Establishment of Centres of Excellence
1991 Member, NSERC-Centre Saint-Laurent Grant Selection Committee
1991-2001 Member of the Board of Hydromantis, Inc.
1991-1993 Member, NSERC Industrial Research Chairs (UBC, Waterloo, UQAM)
1989-1993 Member, NSERC Grant Selection Committee (06) – Chair (1991-92)
1990-1993 Associate Editor – **Canadian Journal of Civil Engineering**
1988-1991 Member, U.S. EPA Review Panel in Environmental Chemistry & Physics
1989 Member, Review panel for the establishment of an Environmental Engineering program at UQAM
1987 Member of the U.S. EPA Hazardous Substance Committee for the establishment of Centres of Excellence

f) MEMBERSHIPS

Professional Engineers Ontario – Registered P.Eng.

g) GRADUATE SUPERVISION

Career Number:	34 M.Eng.	3 Ph.D.	5 PDF
Completed:	34	3	5
In Progress	0	0	0

h) GRADUATE COURSES (1993-2008)

None, except for the supervision of graduate students. Dean of Engineering (1993-97) and Vice-Rector (Academic) (1997-2001), President (2001-2008), research leave (2008-date)

2009 CEE6331 Guest lectures (2 weeks) on dynamic modeling of wastewater Treatment plants at Georgia Institute of Technology (Winter 2009)

i) UNDERGRADUATE COURSES TAUGHT AT THE UNIVERSITY OF OTTAWA

BCH 4172 Topics in Biotechnology (2005, 2006, 2007, 2015) – Lectures on wastewater treatment, including the process of innovation in water and wastewater engineering

CVG 4181 Modelling and Computer Applications in Civil Engineering (Winter 1996)

CVG 2181 Numerical Modelling in Civil Engineering (Winter 1997)

j) RESEARCH FUNDING

Year	Amount	Description
1999-2004	\$176,400	NSERC Research grant (\$44,100/year). Modelling, Simulation and Control of Wastewater Treatment Plants.
1998-2000	\$94,400.	NSERC – Industrially Oriented Research. Respirometry-based control of the activated sludge process in the pulp and paper industry (\$76,600 research; \$17,800 equip.)
1998-2000	\$152,500.	Environmental Science and Technology Advisory Council (ESTAC). Nitrogen Nutrient Control in Wastewater Treatment Plants Using Respirometry
1994-1999	\$203,000	NSERC Research Grant (\$40,600/yr 1994-1998; \$44,660/yr in 1998-99. Modelling Simulation and Operational Control of Wastewater Treatment Plants.
1994	\$50,423	NSERC Equipment Grant – On-line Respirometer
1994	\$5,000	IDRC – Expert System
1994-1996	\$271,525	Ministry of the Environment of Ont. – Hydromantis, Inc. Respirometry in Wastewater Treatment Plant Modelling
1993-1995	\$49,800	Ministry of the Environment of Ontario. Wastewater Treatment Plant Modelling
1990-1991	\$168,000	Environment Canada – Wastewater Technology Centre. Development of GPS-X and Calibration Studies (3 contracts)
1990	\$42,000	Environment Canada – Wastewater Technology Centre. Calibration Studies using the IAWPRC and GPS-X Models (2 contracts)
1990	\$79,000	NSERC Equipment Grant – Patry, Kramer, Tsanis – RISC-Based Server
1989-1990	\$23,000	Beak Consultants – Modelling of the Hamilton WWTP

1989	\$38,000	Environment Canada – Rule Extraction from Simulation Models
1989-1992	\$111,000	NSERC Operating Grant - \$37,000 per year. Operational Wastewater Treatment Plant Modelling and Control
1988	\$30,000	Environment Canada – Workshop on Dynamic Modelling and Expert Systems in Wastewater Engineering
1987-1989	\$337,000	Lyonnaise des Eaux (France) & Environnement Canada
1986	\$12,000	Environment Canada – Dynamic Modelling of Wastewater Treatment Plants
1986-1989	\$81,000	NSERC Operating Grant (\$27,000 per year) – Analysis of Uncertainty in Water Quality Modelling

RESEARCH FUNDING (continued)

Year	Amount	Description
1985-1986	\$34,000	Environment Canada (Patry and Hill). Energy Savings in Activated Sludge Systems Through Automatic Control
1985-1986	\$4,950	Environment Canada – State-Space Modelling of ESMA Models
1985	\$9,989	Environment Canada – Analysis of Uncertainty in ESMA Models
1985	\$6,000	CANVIRO Ltd. – CAPDET Study
1984-1985	\$11,500	McMaster University – Modelling of Watershed Acidification
1984-1985	\$24,800	Environment Canada – Stochastic Modelling of Watershed Acidification
1984-1985	\$97,349	Environment Canada (Patry and Hill). Energy Savings in Activated Sludge Systems through Automatic Control
1984-1985	\$3,575	McMaster University Teaching and Learning Grants – Microcomputer Applications in Civil Engineering
1983-1986	\$65,720	NSERC Operating Grant (\$21,900 per year) – Stochastic Control of Combined Sewer Systems
1983-1984	\$14,000	McMaster University – Control of Combined Sewer Systems
1981-1982	\$2,200	BGH Planning, Montreal – Stormwater Modelling Studies
1980	\$8,000	Ville d’Anjou – Stormwater Network Models
1979-1982	\$45,000	IBM Canada (Patry, Rousselle). Urban Runoff Modelling
1979-1981	\$18,900	NSERC Operating Grant (\$9,450 per year) – Real-Time Control of Combined Sewer Systems
1979	\$4,000	Ministry of Industry and Commerce, QC – Water Savings in a Vegetable Processing Plant
1979	\$10,000	James Bay Energy Society (Labonté, Patry). Performance Evaluation of a Wastewater Treatment Pond.
1979	\$6,000	Ville d’Anjou – Feasibility Study for the Construction of Stormwater Retention Basins

1979-1980	\$60,000	James Bay Energy (Labonté, Patry). Land Treatment of Wastewaters in Northern Quebec
1978-1979	\$30,000	Environment Canada. ILLUDAS Model Study
1978-1982	\$90,000	NSERC-Regional Development (Rousselle, Patry, Brière) Urban Runoff Modelling
1978-1979	\$4,000	Hydro-Québec – Water Quality Modelling in Stratified Water Bodies

k) PUBLICATIONS

1) Life-Time Count:

- Citations (Oct. 2021) > 4,310 citations
- Citations of top 5 papers (Oct. 2021) > 2,900 citations
- Most highly cited paper (1991) > 1,310 citations
- Books edited 1
- Chapters in books 9
- Papers in refereed journals 59
- Papers in refereed conference proceedings 76
- Technical reports 53
- Workshops presented 9
- Numerous op-ed pieces

2) Details of Publications

Book Edited

1. Patry, G.G. and Chapman, D.T. (Editors) (1989). Dynamic Modeling and Expert Systems in Wastewater Engineering. Lewis Publishers, Inc., Chelsea, Michigan.

Refereed Journal Publications (Published)

1. Guergachi, A. and Patry, G.G. (2006). Constructing a Model Hierarchy with Background Knowledge for Structural Risk Minimization: Application to Biological Treatment of Wastewater. **IEEE Transactions on System, Man and Cybernetics, Part A**. 36(2):373-383.
2. Cretu, A.-M., Petriu, E. and Patry G.G. (2006). Neural-Network-Based Models of 3-D Objects for Virtualized Reality: A Comparative Study. **IEEE Transactions on Instrumentation and Measurement**. 55(1):99-111.
3. Guergachi, A. and Patry, G.G. (2003). Identification, Verification and Validation of Process Models in Wastewater Engineering: a Critical Review. **Journal of Hydroinformatics**, 5(3):181-189.
4. Guergachi, A. and Patry, G.G. (2003) Using Statistical Learning Theory to Rationalize System Model Identification and Validation. Part I: Mathematical Foundations. **Complex Systems**, 14:63-90.
5. Spanjers, H., Patry, G.G., and Keesman, Karel (2002). Respirometry-based On-Line Model Parameter Estimation at a Full-Scale WWTP. **Water Science Tech**. 45(4/5):335-343.

6. Guergachi, A. and Patry, G.G. (2002). Statistical Learning Theory Model Identification and System Information Content. **International Journal of General Systems**, **31** (4):343-357.
7. Daviau, J.-L., Adamowski, K., and Patry, G.G. (2000). Regional Flood Frequency Analysis Using GIS, L-moment and Geostatistical Methods. **Hydrological Processes**, **14**:2731-2753.
8. Ning, Z., Patry, G.G., and Spanjers (2000). Identification and Quantification of Nitrogen Nutrient Deficiency in Activated Sludge Using Respirometry. **Water Research**, **34**(13):3345-3354.
9. Adamowski, K., Liang, G.-C., and Patry, G.G. (1998). Annual Maxima and Partial Duration Flood Series Analysis by Parametric and Non-Parametric Methods. **J. of Hydrological Processes** (John Wiley & Sons Ltd.), **12**:1685-1699.
10. Spanjers, H., Vanrolleghen, P. Nguyen, K., Vanhooren, H., and Patry, G.G. (1998). Towards a Simulation-Benchmark for Evaluating Respirometry-Based Control Strategies. **Water Science Tech.**, **37**(12):219-226.
11. Huang, G.H., Baetz, B.W. and Patry, G.G. (1998). Trash Flow Allocation: Planning Under Uncertainty, **Interfaces**, **28**(6):36-55.
12. Huang, G.H., Baetz, B.W., Patry, G.G. and Turluk, V. (1997). Capacity Design of Waste Management Systems Under Uncertainty: a North American Case Study, **Waste Management & Res.**, **15**(5):523-546.
13. Huang, G.H., Baetz, B.W. and Patry, G.G. (1997). On Grey Integer Programming: An Application to Waste Management Planning Under Uncertainty', **European Journal of Operational Research**, **100**(3):638-642.
14. Huang, G.H., Baetz, B.W. and Patry, G.G. (1997). Development of a Grey Critical Path Method for Construction Planning, **Engineering Optimization**, **28**:157-174.
15. Giroux, E.Y., Spanjers, H., Patry, G.G. and Takács, I. (1996). Dynamic Modelling for Operational Control of a Respirometer. **Water Science Tech.**, **33**(1):297-309.
16. Huang, G.H., Baetz, B.W. and Patry, G.G. (1996). A Grey Hop, Skip, and Jump Method for Generating Decision Alternatives: Planning for the Expansion/Utilization of Waste Management Facilities, **Canadian J. of Civil Engineering**, **23**(6):1207-1209.
17. Watson, B., Rupke, M., Takács, I., and Patry, G.G. (1995). Modelling of Full-Scale Wastewater Treatment Plants. How Detailed Should It Be? **Water Science Tech.**, **30**(2):141-147.
18. Gall, R.A.B., Takács, I. And Patry, G.G. (1995). Effect of Organic Reactions in a Collection System on Wastewater Treatment Plant Performance. **Water Science Tech.**, **31**(7):25-31.
19. Huang, G.H., Baetz, B.W. and Patry, G.G. (1995). Grey Quadratic Programming: Application to Waste Management Planning Under Uncertainty, **Engineering Optimization**, **23**:201-223.
20. Huang, G.H., Baetz, B.W. and Patry, G.G. (1995). Grey Fuzzy Integer Programming: Application to Regional Solid Waste Management Planning, **Socio-Economic Planning Sciences**, **29**:17-38.
21. Huang, G.H., Baetz, B.W. and Patry, G.G. (1995). A Grey Integer Programming Approach for Waste Management Planning, **European J. of Operational Research**, **83**:594-620.
22. Yundt, P., Baetz, B. and Patry, G.G. (1994). Heuristic/Simulation Technique for the Selection of Hazardous Waste Processes in an Integrated Treatment Facility. **Can. J. Civil Eng.**, **21**:752-761.

23. Huang, G.H., Baetz, B.W. and Patry, G.G. (1994). Grey Dynamic Programming for Solid Waste Management Planning Under Uncertainty, **ASCE J. of Urban Planning and Develop.**, 120(3):132-156.
24. Huang, G.H., Baetz, B.W. and Patry, G.G. (1994). Capacity Planning for Solid Waste Management Systems Under Uncertainty, **Civil Engineering Systems**, 11:43-73.
25. Huang, G.H., Baetz, B.W. and Patry, G.G. (1994). A Chance-Constrained Programming Approach for Waste Management Planning Under Uncertainty, in K.W. Hipel and L. Fang (eds.), **Effective Environmental Management for Sustainable Development** (fully refereed), Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 267-280.
26. Huang, G.H., Baetz, B.W. and Patry, G.G. (1994). Waste Flow Allocation Under Independent Stipulation Uncertainties, **Civil Engineering Systems**, 11:209-243.
27. Huang, G.H., Baetz, B.W. and Patry, G.G. (1993). A Grey Fuzzy Linear Programming Approach for Waste Management and Planning Under Uncertainty, **Civil Engineering Systems**, 10:123-146.
28. Patry, G.G. and Takács, I. (1992). Settling of Flocculent Suspension in a Secondary Clarifier. **Water Research**, 26(4):473-479.
29. Patry, G.G. and Barnett, M.W. (1992). Innovative Computing Techniques for the Development of an Integrated Computer Control System. **Water Science Tech.**, 26(5-6):1365-1374.
30. Huang, G.H., Baetz, B.W. and Patry, G.G. (1992). A Grey Linear Programming Approach for Municipal Solid Waste Management Planning Under Uncertainty, **Civil Engineering Systems**, 9:319-335.
31. Takács, I., Patry, G.G. and Nolasco, D. (1991). Dynamic Modelling of the Clarification-Thickening Process. **Water Research**. 25(10):1263-1271.
32. Patry, G.G. and Barnett, M.W. (1992) Innovative Computing Techniques for the Development of an Integrated Computer Control System. **Water Science and Technology**, 26(5-6):1365-1374.
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