



Roger Z. Ríos, Ph.D.

Associate Professor of Operations Research
Systems Engineering Research Lab Administrator
Graduate Program in Systems Engineering
Department of Mechanical and Electrical Engineering
Universidad Autónoma de Nuevo León (México)

COORDINATES

Work:

U.A.N.L.
AP 111 - F, Cd. Universitaria
San Nicolás de los Garza, NL 66450
México

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RESEARCH INTERESTS

General: The mathematical modeling of optimization problems, application and theory of operations research techniques, and design, development, and analysis of efficient algorithms to solve such problems.

Specific research: Heuristic and metaheuristic (GRASP, tabu search, scatter search) techniques for fast and high-quality solutions to hard optimization problems, exact optimization schemes (B&B, B&C, B&P), combinatorial optimization, scheduling, and territory design.

Application areas: Machine scheduling problems in manufacturing systems, optimization of natural gas transmission systems, efficient use of natural resources and environment, and optimal design of sales territories in the product distribution industry.

EDUCATION

Ph.D., Operations Research and Industrial Engineering, 1993 - 97
University of Texas at Austin
Austin, Texas, USA

- Dissertation: *“Optimization of the Flowshop Scheduling Problem with Setup Times”*. This dissertation addresses the makespan minimization of flow shop scheduling problems with sequence-dependent setup times. The research includes the development of both approximate algorithms for practical solutions and exact algorithms based on branch-and-cut and branch-and-bound methods.
- Supervisor: Prof. Jonathan F. Bard.
- Committee: Prof. Paul Jensen, Prof. Leon Lasdon, Prof. David Morton, and Prof. Gang Yu.
- GPA: 4.0 / 4.0.

M.S.E., Operations Research and Industrial Engineering, 1991 - 92
University of Texas at Austin

- GPA: 4.0 / 4.0.

Licenciado (B.Sc.) in Mathematics, 1983 - 88
Universidad Autónoma de Nuevo León (UANL)
San Nicolás de los Garza, NL, México

- Thesis: *“Solution of the Two-Dimensional Steady-State Heat Transfer Equation by the Finite Element Method”*. This thesis studies both linear and quadratic finite element approximations to the heat transfer equation and its impact in real-world glass-forming processes in terms of solution quality and computational (CPU time and memory) requirements.
- Supervisors: Ing. Antonio López-Reyes and Prof. Alfredo Alanís-Durán.
- GPA: 96.0 / 100.0.

ACADEMIC APPOINTMENTS

Associate Professor, June 2002 - present
Assistant Professor, June 1999 - May 2002
UANL, Graduate Program in Systems Engineering, San Nicolás de los Garza, NL, México.

Postdoctoral Research Associate, July 1997 - June 1999
Texas A&M U., Dept. of Industrial Engineering, College Station, Texas, USA.

Assistant Instructor, June - August 1995
Teaching Assistant, June 1994 - May 1997
Graduate Research Assistant, January 1992 - July 1997
U. of Texas, Graduate Program in Operations Research & Industrial Engineering, Austin, USA.

Teaching Assistant, February 1986 - August 1987
UANL, Facultad de Ciencias Físico-Matemáticas (FCFM), San Nicolás de los Garza, México.

Instructor, July - October 1985
Centro Galileo, Monterrey, México.

ADMINISTRATIVE APPOINTMENTS

Systems Engineering Research Lab Administrator, May 2005 - April 2008
Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, NL, México.

Academic Coordinator of Masters Program in Systems Engineering, May 2002 - April 2005
Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, NL, México.

VISITING APPOINTMENTS

Visiting Scholar, September - October 2007
Universitat Politècnica de Catalunya, Departament d'Estadística i Investigació Operativa, Barcelona, Spain.
Host: Prof. Elena Fernández.

Visiting Scholar, July 2005 - June 2006
Universitat Politècnica de Catalunya, Departament d'Estadística i Investigació Operativa, Barcelona, Spain.
Host: Prof. Elena Fernández.

Visiting Scholar, June - August 2004
U. of Colorado, Leeds School of Business, Boulder, Colorado, USA. Host: Prof. Manuel Laguna.

Visiting Researcher, July 1997 - July 1999
U. of Houston, High Performance Computing Center and Dept. of Mathematics, Houston, Texas, USA. Host:
Prof. Ridgway Scott.

PROFESSIONAL APPOINTMENTS

Assistant Researcher, May - August 1991
Eicor Tecnología, San Nicolás de los Garza, México.

- Research on glass-batch composition optimization.
- Implementation of linear programming code for the optimization.

Assistant Researcher, July 1986 - September 1990
Vitro Tec, Monterrey, México.

- Research on glass-forming processes.
- Development of finite element-based algorithms for process simulation.
- Research on efficient solution techniques for sparse matrices.

HONORS

Professional: Mexican System of Research Scientists

- **SNI Fellow, Level 2, January 2006 - December 2009**
Highest award granted by the Mexican National System of Research Scientists (SNI) for scientific merit. Level 2 is the 2nd highest category (out of 4).
- **SNI Fellow, Level 1, July 2000 - December 2005**
Highest award granted by the Mexican National System of Research Scientists (SNI) for scientific merit. Level 1 is the 3rd highest category (out of 4).

Professional

- **Technical Committee Member Recognition, October 2007**
Distinction given by UANL magazine "Ingenierías" for contribution and support as member of its technical committee.
- **SEP-UANL Fellow, Level 5, April 2007 - March 2009**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.
- **AMC Fellow, 2006 -**
Distinction granted by the Mexican Academy of Sciences for outstanding scientific and research contributions.
- **TECNOS Award, 2005**
Supervising professor of thesis "*Operación Eficiente de Redes de Transporte de Gas Natural mediante el Método de Gradiente Reducido Generalizado*" by Humberto Flores, which won the nation-wide TECNOS Award to the Best Master Thesis given by the state of Nuevo León Government.
- **PROMEP Fellow, 2005 - 08**
Distinction granted by the Secretary for Public Education (SEP) under its Faculty Improvement Program (PROMEP).
- **MEC Visiting Scholar Award, July 2005 - June 2006**
Award granted by the Spanish Ministry for Education and Science for visiting scholars on sabbatical leave at Spanish institutions.
- **Biographee, 2006**
Biographical profile listed in *Marquis Who's Who in the World*.
- **SEP-UANL Fellow, Level 5, April 2005 - March 2007**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.
- **Biographee, 2005**
Biographical profile listed in *Leading Scientists of the World 2005*, International Biographical Centre, Cambridge, England.
- **AMC-FUMEC Young Investigator Award, June - August 2004**
Award granted by the Mexican Academy of Sciences and Mexico-USA Science Foundation to pursue Summer research in an American institution. Only six awards were granted nation-wide.
- **SEP-UANL Fellow, Level 5, April 2004 - March 2005**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.

- **Biographee, 2003-2004**
Biographical profile listed in *Who's Who in Science and Engineering*.
- **SEP-UANL Fellow, Level 5, April 2003 - March 2004**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.
- **ALIO Vice-President, November 2002 - October 2004**
Elected by the Latin-American Association on Operations Research (ALIO).
- **SEP-UANL Fellow, Level 3, April 2002 - March 2003**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.
- **SEP-UANL Fellow, Level 3, April 2001 - March 2002**
University-wide distinction granted by SEP through UANL to outstanding faculty members for teaching and research.
- **2000 Excellent Performance, February 2001**
Evaluation granted by the FIME Doctoral Committee, UANL, for yearly scientific production and activities in the doctoral program.
- **Young Investigator Award, October 2000 - October 2003**
Granted by CONACYT to fund a 3-year research project.
- **1999 UANL Research Award, Exact Sciences category, September 2000**
Most prestigious university-wide award granted by UANL to the best research work.
- **Host Researcher, July 2000 - June 2001, July 2001 - June 2002**
CONACYT's "Cátedra Patrimonial de Excelencia" Program, hosting Dr. Vyacheslav Kalashnikov from Central Economics and Mathematics Institute, Moscow, Russia.
- **Invited Cluster Co-chair, May 2000**
"Energy", INFORMS National Meeting, Salt Lake City, USA.
- **UANL Academic Corps Fellow, Level 2, January 1999 - February 2001**
University-wide distinction granted by UANL to outstanding faculty members for teaching and research. Level 2 is the 3rd highest category (out of 4).
- **Invited Cluster Chair, October 1998**
"Energy", INFORMS National Meeting, Seattle, USA.

Graduate: Fellowships and Scholarships

- **Travel Grant, May 1997**
Granted by the Graduate Engineering Council at UT-Austin to attend the INFORMS National Meeting in San Diego, USA.
- **David Bruton Fellowship, 1996 - 97**
Granted by UT-Austin to an outstanding doctoral student.
- **E. D. Farmer Fellowship, 1996 - 97**
Granted by the Institute of Latin American Studies at UT-Austin to an outstanding Mexican doctoral student.

- **Travel Grant, January 1996**
Granted by the NSF and the U. of Arizona to attend the Stochastic Programming Tutorial in Tucson, USA.
- **Travel Grant, October 1995**
Granted by the Mechanical Engineering Dept. at UT-Austin to attend the INFORMS National Meeting in New Orleans, USA.
- **E. D. Farmer Fellowship, 1995 - 96**
Granted by the Institute of Latin American Studies at UT-Austin to an outstanding Mexican doctoral student.
- **E. D. Farmer Fellowship, 1994 - 95**
Granted by the Institute of Latin American Studies at UT-Austin to an outstanding Mexican doctoral student.
- **University Continuing Fellowship, 1993 - 94**
Highest university-wide honor award granted by UT-Austin to an outstanding continuing doctoral student.
- **Fellowship for Ph.D. studies, 1993 - 95**
Granted by CONACYT.
- **Fellowship for M.S. studies, 1991 - 92**
Granted by the Mexican National Council of Science and Technology (CONACYT).

Graduate: Honors and Research Awards

- **Best Graduate Student Paper Award, October 1996**
2nd Student Research Conference, U. of Texas, Austin, USA.
- **Best Graduate Student Paper Award, November 1995**
1st Student Research Conference, U. of Texas, Austin, USA.
- **Omega Rho International Honor Society Inductee, since 1992**
Inducted by the Operations Research Society of America (now INFORMS).

Undergraduate

- **Top ranked Mathematics major student, 1984 - 1987**
UANL, Facultad de Ciencias Físico-Matemáticas.
- **Scholarship for undergraduate studies, 1983 - 1987**
Granted by the Mexican Mathematical Society and the UANL.
- **1st Place on Mathematics Contest, August 1983**
Granted by the Mexican Mathematical Society and the UANL to the winner of the state-wide contest for high school students in the state of Nuevo León, México.

COMMITTEES

Evaluation/Reviewing Committees

- **Miembro del Comité de Pares Académicos para Evaluación de Programas de Posgrado de CONACYT**, Octubre 2007
Acreditación otorgada por el CONACYT para evaluar propuestas sometidas al Programa Nacional de Posgrados de Calidad, convocatoria 2007.
- **Member of CONACYT's Graduate Program Evaluation Committee**, 2007
Certification granted by the Mexican National Council for Science and Technology to evaluate proposals submitted to the National Contest of Quality Graduate Programs.
- **Evaluation Committee Member**, March 2004
2003 UANL Research Award, Engineering and Technology Area
- **Project Evaluation Committee Member**, 2004-2005
UANL PAICyT, Applied Sciences Area
- **External Evaluator**, April 2003
2003 Faculty Ranking, Institutional Research Dept., Facultad Católica de Química e Ingeniería Fray Rogelio Bacon, Rosario, Argentina.
- **Evaluation Committee Member**, March 2003
2002 UANL Research Award, Engineering and Technology Area
- **Member of CONACYT Registry of Certified Reviewers**, 2002 - 2005
Nation-wide certification granted by the Mexican National System for Scientific and Technological Evaluation to evaluate research project proposals in the Engineering area, No. RCEA-07-8798.
- **Project Evaluation Committee Member**, 2002-2003
UANL PAICyT, Applied Sciences Area
- **Evaluation Committee Member**, March 2002
2001 UANL Research Award, Engineering and Technology Area
- **Evaluation Committee Member**, March 2001
2000 UANL Research Award, Exact Sciences Area

Conference Program Committees

- **Program Committee Member**, 2008
XIII Latin-American Summer School on Operations Research (ELAVIO), Lima, Peru.
- **Program Committee Member**, 2007
3rd Iberian-American Meeting on Multicriteria Evaluation and Decision-Making (REDM), Culiacán, México.
- **Program Committee Member**, 2007
I Meeting on Evolutionary Algorithms and Metaheuristics (JAEM), Zaragoza, Spain.
- **Program Committee Member**, 2007
VI International Conference on Operational Research for Development (ICORD), Fortaleza, Brazil.
- **Program Committee Member**, 2007
XII Latin-American Summer School on Operations Research (ELAVIO), Rio de Janeiro, Brazil.
- **Program Committee Member**, 2007

- V Spanish Conference on Metaheuristics, Evolutionary and Bioinspired Algorithms (MAEB), Tenerife, Spain.
- **Program Committee Member, 2006**
XIII Latin-American Conference on Operations Research and Systems (CLAIO), Montevideo, Uruguay.
 - **Program Committee Member, 2006**
VI International Seminar on Systems Engineering (SIIS), Cozumel, México.
 - **International Scientific Committee Member, 2005**
5th WSEAS International Conference on Systems Theory and Scientific Computation (ISTASC'05), Malta.
 - **Program Committee Member, 2005**
Mexican International Conference on Artificial Intelligence (MICAI), Monterrey, México.
 - **Program Committee Member, 2005**
Mexican International Conference on Computer Science (ENC'05), Puebla, México.
 - **Program Committee Member, 2004**
XII Latin-American Conference on Operations Research and Systems (CLAIO), Havana, Cuba.
 - **Program Committee Member, 2004**
Mexican International Conference on Computer Science (ENC'04), Colima, México.
 - **Program Committee Member, 2004**
Mexican International Conference on Artificial Intelligence (MICAI), México City, México.
 - **Program Committee Member, 2004**
X Latin-American Summer School on Operations Research (ELAVIO), Montevideo, Uruguay.
 - **Advisory Committee Member, 2002**
Mexican International Conference on Artificial Intelligence (MICAI), Mérida, México.
 - **Program Committee Member, 2002**
XI Latin-American Conference on Operations Research and Systems (CLAIO), Concepción, Chile.
 - **Program Committee Member, September 2000**
X Latin-American Conference on Operations Research and Systems (CLAIO), México City.
 - **Program Committee Member, January 2000**
7th INFORMS Computing Society Conference, Cancún, México.

PUBLICATIONS

Work in Progress

- [Un método de reducción eficiente para problemas de optimización de redes de transporte de gas natural](#)
R. Z. Ríos Mercado
November 2007 (submitted)
- [La importancia de saber ubicar el centro absoluto de una red en problemas de localización óptima de instalaciones](#)
D. A. Peña Carrillo, A. B. Reyes Ramírez, R. M. Ávila Guerrero, and R. Z. Ríos-Mercado
July 2007 (submitted)
- [Operations Research and Systems \(CLAIO XIII\)](#)
H. Cancela, M. Urquhart, G. Baldoquín, and R. Z. Ríos-Mercado (editors)
Special issue of *Annals of Operations Research*, Kluwer (in preparation)
- [Heuristic Research: Advances and Applications](#)
R. Z. Ríos-Mercado (editor)
Special issue of *Journal of Heuristics*, Springer (in preparation)
- [Improving the operation of pipeline systems on cyclic structures by tabu search](#)
C. Borraz-Sánchez and R. Z. Ríos-Mercado
November 2005 (submitted to *C&CE*)

Books

1. [Operations Research and Systems \(CLAIO XII\)](#)
S. Allende, M. A. Osorio, R. Z. Ríos-Mercado, and J. Ruckmann (editors)
Special issue of *Annals of Operations Research*, Vol. 157, ISSN: 0254-5330. Springer, Norwell, 2008
2. [JAMDS 10th Anniversary Special Issue](#)
Mahyar A. Amouzegar, Khosrow Moshirvaziri, and R. Z. Ríos-Mercado (editors)
Special issue of *Journal of Applied Mathematics and Decision Sciences*, Vol. 2006, ISSN: 1173-9126. Hindawi Publishing, New York, 2006
3. [Latin-Ibero-American Conference on Operations Research \(CLAIO XI\): An International Conference of Current Theory and Practice](#)
L. Pradenas, R. Z. Ríos-Mercado, J. A. Ferland, R. Scherer, P. Michelon, and N. Maculan (editors)
Special issue of *Annals of Operations Research*, Vol. 138, ISSN: 0254-5330. Springer, Norwell, 2005
4. [Operations Research and Systems \(CLAIO 2000\). Part II: Algorithms, Heuristics, and Energy Markets](#)
R. Z. Ríos-Mercado, M. A. Osorio-Lama, L. B. Morales, and F. Maldonado (editors)
Special issue of *Annals of Operations Research*, Vol. 117, ISSN: 0254-5330. Kluwer, Boston, 2002.
5. [Operations Research and Systems \(CLAIO 2000\). Part I: Probability and Mathematical Programming](#)
R. Z. Ríos-Mercado, M. A. Osorio-Lama, L. B. Morales, and F. Maldonado (editors)
Special issue of *Annals of Operations Research*, Vol. 116, ISSN: 0254-5330. Kluwer, Boston, 2002.
6. [Integer Programming and Combinatorial Optimization: Proceedings of the 6th International IPCO Conference](#)
R. E. Bixby, E. A. Boyd, and R. Z. Ríos-Mercado (editors)
Lecture Notes in Computer Science, Vol. 1412, ISBN: 3-540-64590-X. Springer-Verlag, Berlin, 1998

Book Chapters and Contributions

7. [A hybrid meta-heuristic approach for natural gas network optimization](#)
C. Borraz-Sánchez and R. Z. Ríos-Mercado
In M. J. Blesa, C. Blum, A. Roli, and M. Sampels (editors), *Hybrid Metaheuristics*, Lecture Notes in Computer Science, Vol. 3636, pp. 54-65, ISBN: 3-540-28535-0. Springer, Berlin, Germany, 2005.
8. [Computational experience with a GRG method for minimizing fuel consumption on cyclic natural gas networks](#)
H. J. Flores-Villarreal and R. Z. Ríos Mercado
In N. E. Mastorakis, I. A. Stathopoulos, C. Manikopoulos, G. E. Antoniou, V. M. Mladenov, and I. F. Gonos (editors), *Computational Methods in Circuits and Systems Applications*, pages 90-94, ISBN: 960-8052-88-2. WSEAS Press, Athens, Greece, 2003.
9. [Natural gas pipeline optimization](#)
R. Z. Ríos-Mercado
In P. M. Pardalos and M. G. C. Resende, editors, *Handbook of Applied Optimization*, Chapter 18.8.3, pages 813-825. Oxford University Press, New York, 2002
10. [Heuristics for minimum cost steady-state gas transmission networks](#)
S. Kim, R. Z. Ríos-Mercado, and E. A. Boyd
In M. Laguna and J. L. González-Velarde, editors, *Computing Tools for Modeling, Optimization and Simulation: Interfaces in Computer Science and Operations Research*, Chapter 11, pages 203-213. Kluwer, Boston, 2000

Journals

11. [A reactive GRASP for a commercial territory design problem with multiple balancing requirements](#)
R. Z. Ríos-Mercado and E. Fernández
Computers & Operations Research (forthcoming)
12. [Solving a natural gas cash-out bilevel program by a penalty function method](#)
V. V. Kalashnikov and R. Z. Ríos-Mercado
Optimization and Engineering, 7(4):403-420, 2006
13. [Optimal design of gating systems by gradient search methods](#)
C. E. Esparza, M. P. Guerrero-Mata, and R. Z. Ríos-Mercado
Computational Materials Science, 36(4):457-467, 2006
14. [Efficient operation of natural gas transmission systems: A network-based heuristic for cyclic structures](#)
R. Z. Ríos-Mercado, S. Kim, and E. A. Boyd
Computers & Operations Research, 33(8):2323-2351, 2006
15. [Discrete bilevel programming: Application to a natural gas cash-out problem](#)
S. Dempe, V. V. Kalashnikov, and R. Z. Ríos-Mercado
European Journal of Operational Research, 166(2):469-488, 2005
16. [A non-sequential dynamic programming approach for natural gas network optimization](#)
C. Borraz-Sánchez and R. Z. Ríos-Mercado
WSEAS Transactions on Systems, 3(4):1384-1389, 2004
17. [The flow shop scheduling polyhedron with setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Journal of Combinatorial Optimization, 7(3):291-318, 2003

18. [A reduction technique for natural gas transmission network optimization problems](#)
R. Z. Ríos-Mercado, S. Wu, L. R. Scott, and E. A. Boyd
Annals of Operations Research, 117(1-4):217-234, 2002
19. [Model relaxations for the fuel cost minimization of steady-state gas pipeline networks](#)
S. Wu, R. Z. Ríos-Mercado, E. A. Boyd, and L. R. Scott
Mathematical and Computer Modelling, 31(2-3):197-220, 2000
20. [A branch-and-bound algorithm for permutation flow shops with sequence-dependent setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
IIE Transactions, 31(8):721-731, 1999
21. [An enhanced TSP-based heuristic for makespan minimization in a flow shop with setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Journal of Heuristics, 5(1):57-74, 1999
22. [Computational experience with a branch-and-cut algorithm for flowshop scheduling with setups](#)
R. Z. Ríos-Mercado and J. F. Bard
Computers & Operations Research, 25(5):351-366, 1998
23. [Heuristics for the flow line problem with setup costs](#)
R. Z. Ríos-Mercado and J. F. Bard
European Journal of Operational Research, 110(1):76-98, 1998

Magazine Articles

24. [El problema del árbol de empuje en sistemas de telecomunicaciones](#)
K. V. Martínez Facundo, J. A. Saucedo Martínez, J. Á. Segura Ramiro, M. A. Urbano Vázquez, and R. Z. Ríos Mercado
Ingenierías, 10(36):16-22, 2007. In Spanish. Translation: "The push tree problem in telecommunication systems"
25. [Aproximando la función de consumo de combustible en compresores de gas natural](#)
Y. Villalobos Morales and R. Z. Ríos Mercado
Ingenierías, 8(27):48-52, 2005. In Spanish. Translation: "Approximating the fuel consumption function in natural gas compressors"
26. [Preprocesamiento efectivo de un problema de minimización de combustible en sistemas de transporte de gas natural](#)
Y. Villalobos Morales and R. Z. Ríos Mercado
Revista Ingeniería de Sistemas, 19:79-103, 2005. In Spanish. Translation: "Effective preprocessing in a fuel consumption minimization problem on natural gas transmission pipeline system"
27. [Aplicación de la programación lineal en el sector forestal](#)
L. Vargas Suárez, I. Cano Robles, and R. Z. Ríos Mercado
Ingenierías, 7(24):19-26, 2004. In Spanish. Translation: "Application of linear programming in the forestry sector"
28. [Comparando métodos heurísticos para secuenciar tareas en líneas de flujo](#)
M. L. Valenzuela Luna and R. Z. Ríos-Mercado
Ingenierías, 7(25):35-39, 2004. In Spanish. Translation: "Comparison of heuristics for flow shop scheduling"

29. [Minimización heurística del número de tareas tardías al secuenciar líneas de flujo](#)
M. A. Salazar Aguilar and R. Z. Ríos Mercado
Ingenierías, 7(23):52-57, 2004. In Spanish. Translation: "Heuristic minimization of the number of tardy jobs in flow shop scheduling"
30. [La optimización binivel: Estudio de un caso en la industria de gas natural](#)
R. Z. Ríos Mercado and V. V. Kalashnikov
Ingenierías, 6(20):47-52, 2003. In Spanish. Translation: "Bilevel programming: A case study from the natural gas industry"
31. [Secuenciando óptimamente líneas de flujo en sistemas de manufactura](#)
R. Z. Ríos-Mercado and J. F. Bard
Ciencia UANL, 4(1):48-54, 2001. In Spanish. Translation: "Optimal sequencing of flow shops in manufacturing systems"
32. [Heurísticas para secuenciamiento de tareas en líneas de flujo](#)
R. Z. Ríos-Mercado and J. F. Bard
Ciencia UANL, 3(4):420-427, 2000. In Spanish. Translation: "Heuristics for flow shop scheduling"
33. [Investigación de operaciones en acción: Heurísticas para la Solución del TSP](#)
R. Z. Ríos Mercado and J. L. González Velarde
Ingenierías, 3(9):15-20, 2000. In Spanish. Translation: "Operations research in action: Heuristics for the solution of the TSP"
34. [Investigación de operaciones en acción: Aplicación del TSP en problemas de manufactura y logística](#)
J. L. González Velarde and R. Z. Ríos-Mercado
Ingenierías, 2(4):18-23, 1999. In Spanish. Translation: "Operations research in action: Application of the TSP in manufacturing and logistics problems"

Conference Proceedings

35. [A metaheuristic algorithm for a bi-objective supply chain design problem](#)
E. Olivares Benítez, J. L. González Velarde, and R. Z. Ríos-Mercado
In J. C. Leyva López (editor) *Proceedings of the 3rd Meeting of the Ibero-American Network on Multicriteria Decision and Evaluation (RED-M'07)*. Paper 13B-2, pp. 1-7. ISBN: 978-970-660-203-9. Culiacan, Mexico, November 2007
36. [Empirical evaluation of a metaheuristic for commercial territory design with joint assignment constraints](#)
S.I. Caballero-Hernández, R. Z. Ríos-Mercado, F. López, and S. E. Schaeffer
In J.E. Fernandez, S. Noriega, A. Mital, S.E. Butt, and T.K. Fredericks (editors), *Proceedings of the 12th Annual International Conference on Industrial Engineering Theory, Applications, and Practice (IJIE'07)*, pp. 422-427. ISBN: 978-0-9654506-3-8. Cancun, Mexico, November 2007
37. [A location-allocation heuristic for a territory design problem in a beverage distribution firm](#)
J. A. Segura-Ramiro, R. Z. Ríos-Mercado, A. M. Álvarez-Socarrás, and K. de Alba Romenus
In J.E. Fernandez, S. Noriega, A. Mital, S.E. Butt, and T.K. Fredericks (editors), *Proceedings of the 12th Annual International Conference on Industrial Engineering Theory, Applications, and Practice (IJIE'07)*, pp. 428-434. ISBN: 978-0-9654506-3-8. Cancun, Mexico, November 2007
38. [Computational experience with a reactive GRASP for a large scale commercial territory design problem](#)
R. Z. Ríos-Mercado
In M. J. Geiger and W. Habenicht (editors), *Proceedings of EU/ME 2007 "Metaheuristics in the Service Industry"*, pp. 72-79. ISBN: 978-3-00-022976-3. Stuttgart, Germany, October 2007
39. [Solución heurística a un problema de diseño de territorios comerciales con restricciones de asignación conjunta mediante GRASP](#)

S.I. Caballero Hernández, R. Z. Ríos Mercado, and F. López
In E. Alba, F. Chicano, F. Herrera, F. Luna, G. Luque y A. J. Nebro (editors), *Proceedings of the I Spanish Meeting on Evolutionary Algorithms and Metaheuristics (JAEM'07)*, pp. 145-153. Zaragoza, Spain, September 2007

40. [A GRASP for a sales territory design problem with multiple balancing planning criteria](#)
R. Z. Ríos-Mercado and E. Fernández
In *Proceedings of the XIII Latin Ibero American Conference on Operations*, CD-ROM ISBN: 9974-7699-9-X. Montevideo, Uruguay, November 2006
41. [Usando GRASP para resolver un problema de definición de territorios de atención comercial](#)
L. Vargas Suárez, R. Z. Ríos Mercado, and F. López
In M.G. Arenas, F. Herrera, M. Lozano, J.J. Merelo, G. Romero, and A.M. Sánchez (editors), *Proceedings of the IV Spanish Conference on Metaheuristics, Evolutionary and Bioinspired Algorithms, Vol. II*, pp. 609-617. Granada, Spain, September 2005
42. [A tabu search approach for minimizing fuel consumption on cyclic natural gas pipeline systems](#)
C. Borraz-Sánchez and R. Z. Ríos-Mercado
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43. [A procedure for finding initial feasible solutions on cyclic natural gas networks](#)
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44. [Optimización del diseño de un sistema de alimentación en el proceso de producción de piezas automotrices](#)
C. E. Esparza-Garcés, R. Z. Ríos-Mercado, and M. P. Guerrero-Mata
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45. [Evaluando la calidad de técnicas de optimización para un problema de diseño de sistemas de alimentación por gravedad](#)
C. E. Esparza-Garcés, R. Z. Ríos-Mercado, and M. P. Guerrero-Mata
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46. [Efficient operation of natural gas pipeline networks: Computational finding of high quality solutions](#)
H. J. Flores-Villarreal and R. Z. Ríos Mercado
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Y. Villalobos-Morales, D. Cobos-Zaleta, H. J. Flores-Villarreal, C. Borraz-Sánchez, and R. Z. Ríos-Mercado
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49. [An algorithm to solve a gas cash-out problem](#)

V. V. Kalashnikov and R. Z. Ríos-Mercado
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Y. Villalobos-Morales and R. Z. Ríos-Mercado
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51. [Optimizing fuel consumption on gas transmission networks: Evaluation of a heuristic for cyclic systems](#)
R. Z. Ríos-Mercado, S. Kim, and E. A. Boyd
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52. [A penalty-function approach to a mixed-integer bilevel programming problem](#)
V. V. Kalashnikov and R. Z. Ríos-Mercado
In C. Zozaya, M. Mejía, P. Noriega, and A. Sánchez (editors), *Proceedings of the 3rd International Meeting on Computer Science (ENC'01), Vol. II*, pages 1045-1054. Aguascalientes, México, September 2001
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54. [A network reduction technique for natural gas pipeline networks](#)
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56. [A heuristic for minimum cost steady-state gas transmission networks](#)
S. Kim, R. Z. Ríos-Mercado, and E. A. Boyd
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57. [Towards the simplification of natural gas transmission networks](#)
S. Wu, L. R. Scott, E. A. Boyd, and R. Z. Ríos-Mercado
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58. [Compressor driven network flows](#)
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59. [On solving the flow line scheduling problem with setup costs](#)
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In *Proceedings of the 2nd University of Texas Student Research Conference*, pages 93-103. U. of Texas, Austin, October 1996

60. [New heuristics for the flow line problem with setup costs](#)
R. Z. Ríos-Mercado and J. F. Bard
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61. [Optimization of the Flowshop Scheduling Problem with Setup Times](#)
R. Z. Ríos Mercado
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62. [Solución de la Ecuación de Transferencia de Calor Bidimensional en Estado Estable por el Método de Elementos Finitos](#)
R. Z. Ríos Mercado
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Technical Reports

63. [A reactive GRASP for a sales territory design problem with multiple balancing requirements](#)
R. Z. Ríos-Mercado and E. Fernández
Technical Report PISIS-2006-12, Graduate Program in Systems Engineering, UANL, San Nicolás de los Garza, México, September 2006
64. [Improving the operation of pipeline systems on cyclic structures by tabu search](#)
C. Borraz-Sánchez and R. Z. Ríos-Mercado
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65. [Optimal design of gating systems by gradient search methods](#)
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Technical Report PISIS-2004-06, Graduate Program in Systems Engineering, UANL, San Nicolás de los Garza, México, December 2004
66. [Efficient operation of natural gas transmission systems: A network-based heuristic for cyclic structures](#)
R. Z. Ríos-Mercado, S. Kim, and E. A. Boyd
Technical Report PISIS-2003-03, Graduate Program in Systems Engineering, UANL, San Nicolás de los Garza, México, July 2003
67. [Discrete bilevel programming: Application to a gas shipper's problem](#)
S. Dempe, V. V. Kalashnikov, and R. Z. Ríos-Mercado
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68. [Solving a natural gas cash-out bilevel program by a penalty function method](#)
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69. [Preprocesamiento efectivo de un problema de minimización de combustible en sistemas de transporte de gas natural](#)
Y. Villalobos Morales and R. Z. Ríos Mercado
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70. [Preprocessing on natural gas transmission networks](#)

R. Z. Ríos-Mercado, S. Wu, L. R. Scott, and E. A. Boyd
Technical Report PISIS-2000-01, Graduate Program in Systems Engineering, UANL, San Nicolás de los Garza, México, November 2000

71. [Model relaxations for the fuel cost minimization of steady-state gas pipeline networks](#)
S. Wu, R. Z. Ríos-Mercado, E. A. Boyd, and L. R. Scott
Technical Report TR-99-01, Department of Computer Science, U. of Chicago, Chicago, January 1999
72. [An enhanced TSP-based heuristic for makespan minimization in a flow shop with setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Technical Report ORP97-08, Graduate Program in Operations Research & Industrial Engineering, U. of Texas, Austin, December 1997
73. [A branch-and-bound algorithm for flowshop scheduling with setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Technical Report ORP97-02, Graduate Program in Operations Research & Industrial Engineering, U. of Texas, Austin, May 1997
74. [Computational experience with a branch-and-cut algorithm for flowshop scheduling with setups](#)
R. Z. Ríos-Mercado and J. F. Bard
Technical Report ORP97-01, Graduate Program in Operations Research & Industrial Engineering, U. of Texas, Austin, May 1997.
75. [The flowshop scheduling polyhedron with setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Technical Report ORP96-07, Graduate Program in Operations Research & Industrial Engineering, U. of Texas, Austin, July 1996
76. [New heuristics for the flow line problem with setup costs](#)
R. Z. Ríos-Mercado and J. F. Bard
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Industrial Reports

77. [TERMO2D: Simulador térmico de propósitos generales](#)
A. Ortega Morán, R. Z. Ríos Mercado, and M. S. Martínez Solís
Technical Report, Vitro Tec, Monterrey, México, September 1990. In Spanish. Translation: "TERMO2D: General purpose thermal simulator"
78. [Simulador térmico 2-D: Proceso soplo-soplo, lado bombillo](#)
A. Ortega Morán, R. Z. Ríos Mercado, and M. S. Martínez Solís
Technical Report, Vitro Tec, Monterrey, México, September 1990. In Spanish. Translation: "2-D Thermal simulator: Blow-blow process, blank mold stage"
79. [Simulador térmico 2-D: Proceso prensa-soplo, lado bombillo](#)
A. Ortega Morán, R. Z. Ríos Mercado, and M. S. Martínez Solís
Technical Report, Vitro Tec, Monterrey, México, September 1990. In Spanish. Translation: "2-D Thermal simulator: Press-blow process, blank mold stage"
80. [M.E.F. bidimensional inestable](#)
R. Z. Ríos Mercado
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81. [M.E.F. bidimensional estable. Volumen I: Fundamentos](#)
R. Z. Ríos Mercado

Technical Report, Vitro Tec, Monterrey, México, January 1989. In Spanish. Translation: "Finite element method two-dimensional steady state. Volume I: Foundations"

82. [M.E.F. bidimensional estable. Volumen II: Implementación](#)
R. Z. Ríos Mercado and G. Valenzuela Paz
Technical Report, Vitro Tec, Monterrey, México, January 1989. In Spanish. Translation: "F.E.M. two-dimensional steady state. Volume II: Implementation"
83. [Solución de sistemas de ecuaciones lineales algebraicas de alto orden](#)
R. Z. Ríos Mercado
Technical Report, Vitro Tec, Monterrey, México, April 1987. In Spanish. Translation: "Solution of symmetric large-scale systems of linear algebraic equations"

TALKS

Invited Talks, Seminars

1. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2007.
2. [Dynamic programming and its application to optimization problems](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2007.
3. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2007.
4. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2007.
5. [The key importance of math: The applied side of the force](#)
R. Z. Ríos Mercado
Plenary speaker, XL Mexican Mathematical Society Conference, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, México, October 2007.
6. [On marriage stability problems](#)
R. Z. Ríos Mercado
Plenary speaker, XL Mexican Mathematical Society Conference, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, México, October 2007.
7. [The fascinating road in a scientist education](#)
R. Z. Ríos Mercado
PISIS Summer Seminar Series, FIME, UANL, San Nicolás de los Garza, México, July 2007.
8. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, May 2007.

9. [Improving the quality of sales territory design in a distribution firm by a reactive GRASP method](#)
R. Z. Ríos Mercado
Supply Chain group seminar series, Center for Quality and Manufacturing, ITESM, Monterrey, March 2007.
10. [Efficient sales territory design: A successful case study of metaheuristic optimization in a beverage distribution firm](#)
R. Z. Ríos Mercado
Seminar Series honoring the 40th Anniversary of OR Graduate Program, School of Engineering, UNAM, Mexico City, November 2006.
11. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2006.
12. [Dynamic programming and its application to optimization problems](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, October 2006.
13. [Advanced metaheuristics for flow shop scheduling problems](#)
R. Z. Ríos Mercado
Mathematics Seminar, FCFM, UANL, San Nicolás de los Garza, México, October 2006.
14. [Optimization of industrial systems](#)
R. Z. Ríos Mercado
Plenary speaker, XXXIX Mexican Mathematical Society Conference, Universidad Juárez Autónoma de Tabasco, Villahermosa, Tabasco, México, October 2006.
15. [Advanced metaheuristics for sales territory design](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, September 2006.
16. [Curiosities in the making of a scientist](#)
R. Z. Ríos Mercado
PISIS Summer Seminar Series, FIME, UANL, San Nicolás de los Garza, México, August 2006.
17. [Optimization of a sequence-dependent setup time flow shop by scatter search](#)
R. Z. Ríos Mercado
Seminar series, Department of Statistics, Operations Research, and Computing. Universidad de La Laguna, Tenerife, Spain, June 2006.
18. [Efficient operation of natural gas transportation systems](#)
R. Z. Ríos Mercado
Seminar series, Department of Statistics and Operations Research, Universitat Politècnica de Catalunya, Barcelona, Spain, March 2006.
19. [Decision-making problems in manufacturing systems](#)
R. Z. Ríos Mercado
FIME, UANL, San Nicolás de los Garza, México, May 2005.
20. [Decision-making problems in manufacturing systems](#)
R. Z. Ríos Mercado
FIME, UANL, San Nicolás de los Garza, México, May 2005.

21. [Decision-making problems in manufacturing systems](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, May 2005.
22. [Decision-making problems in manufacturing systems](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, May 2005.
23. [Solving decision-making problems under uncertainty by stochastic optimization](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, April 2005.
24. [Applying scatter search to a machine scheduling problem](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, August 2004.
25. [Dynamic programming and its application to optimization problems](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, February 2004.
26. [On marriage stability problems](#)
R. Z. Ríos Mercado
50th FCFM Anniversary Conference, UANL, Campus Mederos, Monterrey, México, 14 October 2003.
27. [Decision-making problems in manufacturing systems](#)
R. Z. Ríos Mercado
1st Graduate Research Colloquium, FIME, UANL, San Nicolás de los Garza, México, 09 October 2003.
28. [Modeling and solution of decision-making problems](#)
R. Z. Ríos Mercado
7th Symposium on Informatics, School of Accounting and Management, Universidad Autónoma del Estado de México, Toluca, México, 03 October 2003.
29. [Optimal sequencing of flow shops in manufacturing systems](#)
R. Z. Ríos Mercado
Seminar Series, School of Engineering, UNAM, México DF, 02 October 2003.
30. [Scientific support to decision-making problems](#)
R. Z. Ríos Mercado
1st FIME Symposium on Operations Research and Systems (IO-FIME), Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, NL, México, 01 October 2003.
31. [The stable marriage problem](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, August 2003.
32. [Curiosities in the making of a scientist](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, July 2003.
33. [Scientific support to decision-making problems](#)
R. Z. Ríos Mercado
1st FIME Conference on Engineering Applied Knowledge, Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, México, May 2003.

34. [The key importance of math: The applied side of the force](#)
R. Z. Ríos Mercado
Universidad de Monterrey, San Pedro Garza García, NL, México, April 2003.
35. [The stable marriage problem and its application to decision making](#)
R. Z. Ríos Mercado
13th National School on Optimization and Numerical Analysis (ENOAN), Saltillo, México, March 2003.
36. [Solving a transportation problem under uncertainty by stochastic optimization](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, 03 March 2003.
37. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
Universidad de Monterrey, San Pedro Garza García, NL, México, November 2002.
38. [Computational issues in decision-making problems](#)
R. Z. Ríos Mercado
10th ITS Symposium on Computer Systems, Instituto Tecnológico de Saltillo, México, October 2002.
39. [Exploiting effectively the mathematical structure of a scheduling problem in manufacturing systems](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, Mexico, September 2002.
40. [The stable marriage problem and its application to decision making](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, May 2002.
41. [Solving decision-making problems under uncertainty by stochastic optimization](#)
R. Z. Ríos Mercado
12th ITNL Conference on Industrial Engineering, Instituto Tecnológico de Nuevo Laredo, México, April 2002.
42. [On marriage stability problems](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, February 2002.
43. [The stable marriage problem](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, February 2002.
44. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, November 2001.
45. [Modeling decision-making problems through operations research](#)
R. Z. Ríos Mercado
Universidad Autónoma de Tamaulipas, Cd. Mante, México, October 2001.
46. [Modeling decision-making problems through stochastic programming](#)
R. Z. Ríos Mercado
FIME, UANL, San Nicolás de los Garza, México, September 2001.
47. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
PISIS Seminar Series, FIME, UANL, San Nicolás de los Garza, México, August 2001.

48. [Modeling decision-making problems through operations research](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, June 2001.
49. [Modeling decision-making problems through operations research](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, June 2001.
50. [Industrial applications of linear algebra: Sparse matrices](#)
R. Z. Ríos Mercado
FCFM, UANL, San Nicolás de los Garza, México, May 2001.
51. [Heuristics for optimal sequencing of flow lines in manufacturing environments](#)
R. Z. Ríos Mercado
Center for Artificial Intelligence, Monterrey Tech, Monterrey, México, April 2001.
52. [Heuristics for scheduling flow lines with setup times](#)
R. Z. Ríos Mercado
PISIS Seminar Series, Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, México, April 2001.
53. [Optimal sequencing of flow shops in manufacturing systems](#)
R. Z. Ríos Mercado
11th ITNL Conference on Industrial Engineering, Instituto Tecnológico de Nuevo Laredo, México, March 2001.
54. [Successful Graduates](#)
R. Z. Ríos Mercado
Panel, Facultad de Ciencias Físico-Matemáticas, UANL, San Nicolás de los Garza, México, November 2000.
55. [Optimal sequencing of flow shops in manufacturing systems](#)
R. Z. Ríos Mercado
Universidad del Norte, Monterrey, México, November 2000.
56. [Optimal sequencing of flow shops in manufacturing systems](#)
R. Z. Ríos Mercado
Facultad de Ciencias Físico-Matemáticas, UANL, San Nicolás de los Garza, México, September 2000.
57. [Optimal sequencing of flow shops in manufacturing systems](#)
R. Z. Ríos Mercado
Mathematics Department Seminar Series, Instituto Tecnológico Autónomo de México, México City, September 2000.
58. [Computational complexity: When an Optimization Problem is Easy or Hard to Solve](#)
R. Z. Ríos Mercado
PISIS Seminar Series, Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, México, August 2000.
59. [The importance of mathematics and computing in forming human resources at the graduate level](#)
R. Z. Ríos Mercado
Facultad de Ciencias Físico-Matemáticas, UANL, San Nicolás de los Garza, México, November 1999.

60. [Computational complexity](#)
R. Z. Ríos Mercado
Scientific Summer for high school students, Facultad de Ingeniería Mecánica y Eléctrica, UANL, San Nicolás de los Garza, México, July 1999.
61. [Network optimization in the gas industry](#)
R. Z. Ríos Mercado
Center for Manufacturing Systems, Monterrey Tech, Monterrey, México, August 1997.
62. [On solving the flow line scheduling problem with setup costs](#)
R. Z. Ríos Mercado
Operations Research/Management Science Seminar Series, U. of Texas, Austin, March 1997.
63. [Applications of operations research in industry](#)
R. Z. Ríos Mercado
7th ITNL Conference on Industrial Engineering, Instituto Tecnológico de Nuevo Laredo, México, March 1997.
64. [Machine scheduling: Applications of combinatorial optimization](#)
R. Z. Ríos Mercado
Facultad de Ciencias Físico-Matemáticas, UANL, San Nicolás de los Garza, México, April 1995.
65. [Computational experience with an interior point method code](#)
R. Z. Ríos Mercado
Center for Manufacturing Systems, Monterrey Tech, Monterrey, México, March 1993.
66. [Interior point methods for linear programming](#)
R. Z. Ríos Mercado
Facultad de Ciencias Físico-Matemáticas, UANL, San Nicolás de los Garza, México, November 1992.

Paper Presentations at Conferences

67. [Operations research techniques for optimal commercial territory design](#)
R. Z. Ríos Mercado
XL Mexican Mathematical Society Conference, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, México, October 2007.
68. [Computational experience with a reactive GRASP for a large scale commercial territory design problem](#)
R. Z. Ríos Mercado
8th EU/MEeting on Metaheuristics in the Service Industry. Stuttgart, Germany, October 2007.
69. [Solución heurística a un problema de diseño de territorios comerciales con restricciones de asignación conjunta mediante GRASP](#)
S. I. Caballero Hernández, R. Z. Ríos Mercado, and F. López
1st Spanish Meeting on Evolutionary Algorithms and Metaheuristics (JAEM'07). Zaragoza, Spain, 13-14 September 2007.
70. [A GRASP for a sales territory design problem with multiple balancing requirements](#)
R. Z. Ríos-Mercado and E. Fernández
3rd International Workshop on Freight Transportation and Logistics (Odysseus), Altea, Spain, 23-26 May 2006.
71. [An improved scatter search approach for makespan minimization in a flow shop with sequence-dependent setup times](#)
R. Z. Ríos Mercado and M. Laguna
5th ALIO/EURO Conference on Combinatorial Optimization, ENST, Paris, France, 26-28 October 2005.

72. [Usando GRASP para resolver un problema de definición de territorios de atención comercial](#)
L. Vargas Suárez, R. Z. Ríos Mercado, and F. López
IV Spanish Conference on Metaheuristics, Evolutionary and Bioinspired Algorithms MAEB'05, Granada, Spain, 13-16 September 2005.
73. [A hybrid meta-heuristic approach for natural gas network optimization](#)
C. Borraz-Sánchez and R. Z. Ríos Mercado
2nd International Workshop on Hybrid Metaheuristics, Universitat Politècnica de Catalunya, Barcelona, Spain, 29-30 August 2005.
74. [A tabu search approach for minimizing fuel consumption on cyclic natural gas pipeline systems](#)
C. Borraz-Sánchez and R. Z. Ríos Mercado
XII Latin-Ibero-American Conference on Operations Research and Systems, Havana, Cuba, October 2004.
75. [Optimization of cyclic natural gas transmission systems by tabu search: A computational experience](#)
C. Borraz-Sánchez and R. Z. Ríos Mercado
International Conference on Cybernetics and Information Technologies, Systems and Applications, Orlando, July 2004.
76. [A Non-sequential Dynamic Programming Approach for Cyclic Natural Gas Pipeline Systems](#)
C. Borraz-Sánchez and R. Z. Ríos Mercado
CORS/INFORMS Joint International Meeting, Banff, Canada, May 2004.
77. [Natural gas transmission systems: An overview of optimization methods](#)
R. Z. Ríos Mercado
15th Annual POM Conference, Cancún, Mexico, May 2004.
78. [Computational experience with a GRG method for minimizing fuel consumption on cyclic natural gas networks](#)
H. J. Flores-Villarreal and R. Z. Ríos Mercado
7th WSEAS International Conference on Systems. Corfu, Greece, July 2003.
79. [A MINLP model for minimizing fuel consumption on natural gas pipeline networks](#)
D. Cobos-Zaleta and R. Z. Ríos-Mercado
11th Latin-Ibero-American Conference on Operations Research, Concepción, Chile, October 2002.
80. [Optimizing fuel consumption on gas transmission networks: Evaluation of a heuristic for cyclic systems](#)
R. Z. Ríos-Mercado, S. Kim, and E. A. Boyd
IEEE International Conference on Systems, Man, and Cybernetics, Tucson, October 2001.
81. [Natural gas pipeline optimization: The state of the art](#)
R. Z. Ríos-Mercado
INFORMS National Meeting, San Antonio, USA, November 2000.
82. [A network reduction technique for natural gas pipeline networks](#)
R. Z. Ríos-Mercado, S. Wu, E. A. Boyd, and L. R. Scott
10th Latin-American Conference on Operations Research and Systems. México City, September 2000.
83. [Heuristics for minimum cost steady-state gas transmission networks](#)
R. Z. Ríos-Mercado, S. Kim, and E. A. Boyd
Invited paper, 7th INFORMS Computing Society Conference, Cancún, México, January 2000.
84. [Evaluating model relaxations for least cost gas transmission networks](#)
R. Z. Ríos-Mercado, S. Wu, E. A. Boyd, and L. R. Scott
6th SIAM Conference on Optimization, Atlanta, May 1999.
85. [Lower bounds for fuel cost minimization on gas transmission networks](#)

R. Z. Ríos-Mercado
INFORMS National Meeting, Seattle, October 1998.

86. [Optimization of natural gas pipeline networks](#)
R. Z. Ríos-Mercado, E. A. Boyd, L. R. Scott, and S. Wu
SIAM Annual Meeting, Toronto, Canada, July 1998.
87. [Mathematical models for the marketing of natural gas pipeline networks](#)
R. Z. Ríos-Mercado, R. Elizondo, and E. A. Boyd
INFORMS National Meeting, Montreal, Canada, April 1998.
88. [Lower bounds for makespan minimization in a flow shop with setups](#)
R. Z. Ríos-Mercado and J. F. Bard
Invited paper, INFORMS National Meeting, Montreal, Canada, April 1998.
89. [Evaluating the quality of pipeline optimization algorithms](#)
R. Z. Ríos-Mercado, E. A. Boyd, L. R. Scott, and S. Wu
NSF Design and Manufacturing Grantees Conference, Monterrey, México, January 1998.
90. [A hybrid heuristic for flowshop scheduling with setups](#)
R. Z. Ríos-Mercado and J. F. Bard
INFORMS National Meeting, Dallas, October 1997.
91. [A branch-and-bound algorithm for flowshop scheduling with setups](#)
R. Z. Ríos-Mercado and J. F. Bard
INFORMS National Meeting, San Diego, May 1997.
92. [On solving the flow line problem with setup costs](#)
R. Z. Ríos-Mercado and J. F. Bard
2nd University of Texas Student Research Conference, U. of Texas, Austin, October 1996.
93. [New heuristics for the flow line problem with setup costs](#)
R. Z. Ríos-Mercado and J. F. Bard
1st University of Texas Student Research Conference, U. of Texas, Austin, November 1995.
94. [A greedy randomized adaptive search procedure for the flowshop problem with sequence-dependent setup times](#)
R. Z. Ríos-Mercado and J. F. Bard
Invited paper, INFORMS National Meeting, New Orleans, October 1995.

STUDENT THESIS SUPERVISION

In progress

- Jaime Cano (Postdoc), *"Location Problems in Territory Design."* Graduate Program in Systems Engineering, UANL.
- Angélica Salazar (PhD), *"Multiobjective Optimization for Territory Design."* Graduate Program in Systems Engineering, UANL (co-chaired with Prof. Mauricio Cabrera, PISIS, UANL.)
- Diana L. Huerta (MSc), *"Segmentación de Clientes: Aplicación de Diseño Territorial Comercial,"* Graduate Program in Systems Engineering, UANL.
- Juan C. Salazar (MSc), *"Diseño Territorial con Distancias de Red,"* Graduate Program in Systems Engineering, UANL.
- J. Ángel Segura (MSc), *"Metaheurísticas basadas en Localización-Asignación para Diseño de Territorios,"* Graduate Program in Systems Engineering, UANL.
- Saúl I. Caballero (MSc), *"Búsqueda Tabú para Diseño de Territorios,"* Graduate Program in Systems Engineering, UANL.
- Nancy Solís (BSc), *"Modelos para Diseño de Territorios,"* Lic. in Mathematics, School of Physics and Mathematics, UANL.

Chaired: Ph.D.

- Elias Olivares (2007), *"Capacitated Fixed Cost Facility Location Problem with Lead Time Choices."* Center for Quality and Manufacturing (CCM), ITESM (co-chaired with Prof. José Luis González, CCM, ITESM.)
- Carlos E. Esparza (2003), *"Optimización de un Sistema de Alimentación para el Llenado de Moldes con Aleaciones de Aluminio."* Graduate Program in Materials Engineering (DIMAT), UANL (co-chaired with Prof. Martha P. Guerrero, DIMAT, UANL.) In Spanish, translation: "Gating System Optimization for Mold Filling with Aluminum Alloys."

Chaired: M.Sc.

- Leticia G. Vargas (2005), *"Un Procedimiento de Búsqueda Miopé Adaptativa y Aleatorizada para la Definición de Territorios de Atención Comercial,"* M.Sc. in Systems Eng., Graduate Program in Systems Engineering, UANL. In Spanish, translation: "A GRASP for a Sales Territory Design Problem."
- Humberto J. Flores (2005), *"Operación Eficiente de Redes de Transporte de Gas Natural mediante el Método de Gradiente Reducido Generalizado,"* M.Sc. in Systems Eng., Graduate Program in Systems Engineering, UANL. In Spanish, translation: "Efficient Operation of Natural Gas Transmission Networks by the GRG Method." Winner of TECNOS Award to Best Master Thesis.
- Conrado Borraz (2004), *"Una Metodología de Solución basada en Programación Dinámica No Secuencial y Búsqueda Tabú para la Operación Eficiente de Sistemas de Transporte de Gas Natural en Estado Estable."* M.Sc. in Systems Eng., Graduate Program in Systems Engineering, UANL. In Spanish, translation: "A Solution Methodology based on Non-sequential Dynamic Programming and Tabu Search for the Efficient Operation of Steady-State Natural Gas Transportation Systems."
- Diana Cobos (2003), *"Modelos de Optimización Entera Mixta No Lineal en Sistemas de Transporte de Gas Natural."* M.Sc. in Systems Eng., Graduate Program in Systems Engineering, UANL. In Spanish, translation: "Mixed-Integer Nonlinear Programming Models in Natural Gas Transportation Systems."
- Yanet Villalobos (2002), *"Pre-procesamiento de un Problema de Optimización de Redes de Gas Natural."* M.Sc. in Systems Eng., Graduate Program in Systems Engineering, UANL. In Spanish, translation: "Pre-processing of a Natural Gas Network Optimization Problem."

Committee Member / External Advisor

- Anel B. Reyes (M.Sc.), *"Cotas Inferiores para un Problema de Diseño de Cadena de Suministro con Múltiples Criterios de Desempeño,"* Graduate Program in Systems Engineering, UANL. In progress.
- J. F. Augusto Medina (M.Sc.), *"Un Enfoque Robusto a un Problema de Diseño de Red Multiproducto con Incertidumbre en Parámetros de Entrada,"* Graduate Program in Systems Engineering, UANL, 2005. In Spanish, translation: "A Robust Optimization Approach to a Multicommodity Network Design Problem with Parameter Uncertainty."
- Karim de Alba (Ph.D.), *"Un Procedimiento Heurístico para un Problema de Diseño de Redes Multiproducto con Capacidad Finita y Cargos Fijos,"* Graduate Program in Systems Engineering, UANL,

2004. In Spanish, translation: "A Heuristic Procedure for a Capacitated Fixed-Charge Multicommodity Network Design Problem."
- Ma. Aracelia Alcorta (Ph.D.), "*Tratamiento Integral de Filtrado y Control Óptimo de Procesos No Lineales con Múltiples Retardos Variantes en el Tiempo*," Doctoral Program in Industrial Physics Engineering, FCFM, UANL, 2003. In Spanish, translation: "Filtering and Optimal Control of Nonlinear Processes with Multiple Time Delays."
 - Seongbae Kim (Ph.D.), "*Minimum-Cost Fuel Consumption on Natural Gas Transmission Network Problem*," Dept. of Industrial Engineering, Texas A&M U., 1999.
 - Suming Wu (Ph.D.), "*Steady-State Simulation and Fuel Cost Minimization of Gas Pipeline Networks*," Dept. of Mathematics, U. of Houston, 1998.

PROJECTS

Grants as a PI

- "*Metaheuristic Optimization Techniques for Efficient Commercial Territory Design*" (2007 - 2008)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA1478-07, \$65,000 pesos (\$5,900 USD).
- "*Intelligent Optimization of Commercial Territory Design Problems*" (2007 - 2010)
Awarded by CONACYT, grant no. 48499-Y, \$514,500 pesos (\$46,770 USD).
- "*Optimal Sequencing of Flow Shops with Setup Times*" (2006 - 2007)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA1262-06, \$65,000 pesos (\$5,900 USD).
- "*Improving the Quality of Optimization Methods for Flow Shop Scheduling Problems*" (2005 - 2006)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA1058-05, \$60,000 pesos (\$5,450 USD).
- "*Intelligent Optimization of Flow Shop Scheduling*" (2004)
Awarded by AMC-FUMEC, Young Investigator Program for Summer Research, \$4,500 USD.
- "*Pipeline Network Optimization: Implementation of Heuristic Techniques*" (2004 - 2005)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA820-04, \$60,000 pesos (\$5,200 USD).
- "*Heuristic Methods for Pipeline Network Optimization*" (2002 - 2003)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA763-02, \$60,000 pesos (\$6,500 USD).
- "*Evaluating the Quality of Optimization Algorithms for Pipeline Networks*" (2001 - 2002)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA555-01, \$60,000 pesos (\$6,315 USD).
- "*Intelligent Optimization of Natural Gas Transmission Networks*" (2000 - 2003)
Awarded by CONACYT, Young Investigator Project Program, grant no. J33187-A, \$1,123,553 pesos (\$118,760 USD).
- "*Efficient Operation of Natural Gas Transmission Networks*" (2000 - 2001)
Awarded by UANL, Scientific and Technological Research Support Program, grant no. CA363-00, \$50,000 pesos (\$5,263 USD).
- "*Efficient Operation of Natural Gas Transmission Networks*" (1999 - 2000)
Awarded by CONACYT, Installation Project Program, grant no. I32827-A, \$70,000 pesos (\$7,368 USD).

Other Awards/Funding

- *"Funding for PISIS-UANL Infrastructure"* (2002)
Co-directors: Dr. Roger Z. Ríos, Dra. Ada Álvarez. Collaborators: Dr. Óscar Chacón, Dr. César Villarreal, Dr. Igor Litvinchev. Awarded by CONACYT under the PIFOP Program, grant C/PFPN-2002-20-12, for a new building for the Graduate Program in Systems Engineering at UANL, \$8'000,000 pesos (800,000 USD).
- *"Funding for PISIS-UANL Computer Lab"* (2002)
Co-directors: Dr. Roger Z. Ríos, Dra. Ada Álvarez. Collaborators: Dr. Óscar Chacón, Dr. César Villarreal, Dr. Igor Litvinchev. Awarded by CONACYT under the PIFOP Program, grant C/PFPN-2002-20-12, for a new high performance computer lab for the Graduate Program in Systems Engineering at UANL, \$1'200,000 pesos (120,000 USD).
- *"Funding for PISIS-UANL Research Collaboration"* (2002)
Co-directors: Dr. Roger Z. Ríos, Dra. Ada Álvarez. Collaborators: Dr. Óscar Chacón, Dr. César Villarreal, Dr. Igor Litvinchev. Awarded by CONACYT under the PIFOP Program, grant C/PFPN-2002-20-12, for supporting research collaboration between faculty from the Graduate Program in Systems Engineering at UANL and other institutions, \$600,000 pesos (60,000 USD).

Participant in Other Projects

- Research Associate in *"Robust Design of Multiobjective Supply Chains with Stochastic Costs and Demands."* PI: Dr. Ada M. Álvarez (UANL). Sponsored by SEP-PAICYT, grant 61903, 2007 - 2010.
- Research Associate in *"Advanced Optimization Techniques for Supply Chains."* PI: Dr. Igor Litvinchev (UANL). Sponsored by SEP-PAICYT, grant 61343, 2007 - 2010.
- Supervising Professor in *"GRASP for Territory Design"*. MSc student: Leticia G. Vargas (UANL). Sponsored by a grant for master studies from CONACYT, 2003 - 2005.
- Research Associate in *"Solution of Bilevel Programming Problems by Penalty Function Techniques."* PI: Dr. Vyacheslav V. Kalashnikov (UANL). Sponsored by UANL-PAICYT, grant CA562-01, 2001 - 2002.
- Co-supervising Professor in *"Optimal Design of Gating Systems"*. PhD student: Carlos E. Esparza (UANL). Partly sponsored by a grant for doctoral studies from CONACYT and NEMAK, 2000 - 2003.
- Research Associate in *"Compressor-Driven Network Flows."* PI: Dr. E. Andrew Boyd (Texas A&M U.) Sponsored by the National Science Foundation, grant no. DMI-9622106, 1997 - 99.
- Research Associate in *"Safe and Energy-Efficient Natural Gas Networks."* Co-PIs: Dr. E. Andrew Boyd (Texas A&M U.) and Dr. L. Ridgway Scott (U. of Houston). Sponsored by the Texas Higher Education Coordinating Board, ARP/ATP, grant no. 999903-122, 1997 - 98.

TEACHING

Courses Taught: Undergraduate

- Operations Research (48 hrs./semester, UANL-FIME, twice, 2004 - 2005)
- Introduction to Operations Research (45 hrs./semester, U. of Texas - Austin, once, 1995)
- Engineering Economic Analysis (30 hrs./semester, U. of Texas - Austin, 4 times, 1995 - 97)

Courses Taught: Graduate

- Data Structures in C++ (48 hrs./semester, UANL-FIME, twice, 2004 - 2005)
- Network Flow Programming (48 hrs./semester, UANL-FIME, 4 times, 2002 - 2007)
- Queueing Systems (48 hrs./semester, UANL-FIME, once, 2001)
- Foundations of Stochastic Processes (48 hrs./semester, UANL-FIME, twice, 2000 - 2001)
- Queueing Theory (45 hrs./semester, UANL-FCQ, once, 2000)
- Foundations of Integer Programming (48 hrs./semester, UANL-FIME, once, 2000)
- Linear Programming (48 hrs./semester, UANL-FIME, 4 times, 1999 - 2003)

PROFESSIONAL SERVICE

Editorships

- Guest Editor, *Journal of Heuristics*, Vol. ?, Springer, 2006-
- Guest Co-editor, *Annals of Operations Research*, Vol. ?, Springer, 2006-
- Guest Co-editor, *Annals of Operations Research*, Vol. 157, Springer, 2004-2007
- Associate Editor, Area: Operations Research, *Journal of Applied Mathematics and Decision Science*, March 2003 - present
- Editorial Board Member, *Ingenierías*, January 2005 - present
- Guest Co-editor, *J. of Applied Mathematics and Decision Science*, Vol. 2006, special issue 1, Hindawi, 2006
- Guest Co-editor, *Annals of Operations Research*, Vol. 138, Springer, 2003-2005
- Guest Co-editor, *Annals of Operations Research*, Vol. 117, Kluwer, 2000-2002
- Guest Co-editor, *Annals of Operations Research*, Vol. 116, Kluwer, 2000-2002
- Co-editor, *Integer Programming and Combinatorial Optimization*, Vol. 1412, Lecture Notes in Computer Science, Springer, 1997-1998

Service to UANL

- Host Professor, 1 undergraduate students supervised during the IX Scientific Summer Program, June-July 2007.
- Host Professor, 1 undergraduate students supervised during the VIII Scientific Summer Program, June-July 2006.
- Reviewer, 2003 UANL Research Award, Engineering and Technology category, March 2004
- Project Reviewer, 2004 UANL PAICyT, Applied Sciences Area, January 2004
- Organizing Committee Member, 1st FIME Symposium on Operations Research and Systems, October 2003
- Reviewer, 2002 UANL Research Award, Engineering and Technology category, March 2003
- Collaborator, Symposium on Education, Science, and Technology, FIME, October 2002
- Host Professor, 2 undergraduate students supervised during the IV Scientific Summer Program, July-August 2002.
- Project Reviewer, 2002 UANL PAICyT, Applied Sciences Area, April 2002
- Reviewer, 2001 UANL Research Award, Engineering and Technology category, March 2002
- Host Professor, 1 high school student supervised during the III Scientific Summer Program, July-August 2001.
- Reviewer, 2000 UANL Research Award, Exact Sciences category, March 2001
- Host Professor, 2 high school students supervised during the II Scientific Summer Program, July-August 2000.
- Co-founder (with Ada Álvarez and Oscar L. Chacón) of Masters Program in Systems Engineering at Facultad de Ingeniería Mecánica y Eléctrica. Approved by H. Consejo Universitario in December 1999.

Service to Mexican Academy of Sciences

- Host Professor, 2 undergraduate students supervised during the XVII Scientific Summer Program, June-August 2007.
- Host Professor, 2 undergraduate students supervised during the XIV Scientific Summer Program, June-August 2004.
- Host Professor, 2 undergraduate students supervised during the XIII Scientific Summer Program, June-August 2003.
- Host Professor, 1 undergraduate student supervised during the XII Scientific Summer Program, June-August 2002.
- Host Professor, 5 undergraduate students supervised during the XI Scientific Summer Program, June-August 2001.

Conference Organization

- Session Chair, "Meta-Heuristics", 12th CLAIO, Havana, Cuba, October 2004
- Session Chair, "Energy Modeling", CORS/INFORMS Joint International Meeting, Banff, Canada, May 2004
- Session Chair, "Logistics Research and Models", 15th Annual POM Conference, Cancún, Mexico, May 2004
- Organizing Committee Member, 1st FIME Symposium on Operations Research and Systems (IO-FIME), UANL, San Nicolás de los Garza, México, October 2003
- Session Chair, "Simulation and Modeling", 7th WSEAS International Conference on Systems, Corfu, Greece, July 2003
- Session Chair, "Modeling Systems", 11th CLAIO, Concepción, Chile, October 2002
- Session Chair, "Optimization and Mathematical Programming", IEEE International Conference on Systems, Man, and Cybernetics, Tucson, EUA, October 2001
- Session Chair, "Environment and Natural Resources I", INFORMS National Meeting, San Antonio, November 2000
- Session Organizer and Chair, "Branch-and-Cut Algorithms", INFORMS National Meeting, San Antonio, November 2000
- Session Organizer and Chair, "Bilevel Programming", 10th CLAIO, México City, September 2000
- Cluster Co-chair, "Energy", INFORMS National Meeting, Salt Lake City, May 2000
- Session Organizer and Chair, "Applications of Operations Research in the Natural Gas Industry", 7th INFORMS Computing Society Conference, Cancún, México, January 2000
- Session Chair, "Nonlinear Programming II", INFORMS National Meeting, Seattle, October 1998
- Cluster Chair, "Energy", INFORMS National Meeting, Seattle, October 1998
- Organizing Committee Member, 6th International Conference on Integer Programming and Combinatorial Optimization (IPCO), Houston, June 1998

Journal Refereeing

- *Energy*, 1 paper, 2005
- *Journal of Applied Mathematics & Decision Sciences*, 3 papers, 2003 - 2005
- *Ingenierías*, 3 papers, 2001 - 2004
- *European Journal of Operational Research*, 5 papers, 2001 - 2006
- *Journal of Computational and Graphical Statistics*, 1 paper, 1999
- *IIE Transactions*, 1 paper, 1999 - 2001
- *Discrete Applied Mathematics*, 1 paper, 1998
- *International Journal of Operations and Quantitative Management*, 1 paper, 1998
- *Computers & Operations Research*, 6 papers, 1997 - 2002
- *Journal of Heuristics*, 2 papers, 1995 - 1999

Other Refereeing Work

- Reviewer, 2 programs, 2007 CONACYT National Program of High Quality Graduate Programs, November 2007
- Reviewer, 1 paper, *MAEB 2007*, November 2006
- Reviewer, 4 projects, 2005 CONACYT-SEP Research Projects, January 2006
- Reviewer, 2 papers, handled 9 papers, *MICAI 2005*, June 2005
- Reviewer, 5 papers, handled 6 papers, Mexican International Conference on Computer Science, May 2005
- Reviewer, 2 projects, 2004 CONACYT-SEP Research Projects, March 2005
- Reviewer, 6 papers, Mexican International Conference on Computer Science, April 2004
- Reviewer, 9 works, 2003 UANL Research Award, Engineering and Technology category, March 2004
- Reviewer, 43 projects, 2004 UANL PAICyT, Applied Sciences Area, January 2004
- Reviewer, 5 papers, *MICAI 2004*, November 2003
- Reviewer, 5 candidates, Faculty Ranking, Institutional Research Dept., Facultad Católica de Química e Ingeniería Fray Rogelio Bacon, Rosario, Argentina, June-September 2003
- Reviewer, 14 works, 2002 UANL Research Award, Engineering and Technology category, March 2003
- Reviewer, 1 paper, *XIII SNM Conference*, September 2002
- Referee, 1 paper, *MIC 2001*, May and December 2002
- Reviewer, 41 projects, 2002 UANL PAICyT, Applied Sciences Area, April 2002

- Reviewer, 9 works, 2001 UANL Research Award, Engineering and Technology category, March 2002
- Reviewer, 2 papers, *MICAI 2002*, December 2001
- Reviewer, 1 paper, *XXXII ITESM Conference*, October 2001
- Reviewer, 14 works, 2000 UANL Research Award, Exact Sciences category, March 2001
- Reviewer, 5 papers, *X CLAIO*, June 2000
- Referee, 2 papers, *Proceedings of the 9th Industrial Engineering Research Conference*, December 1999
- Reviewer, 1999 Student TECNOS Award (best BSc thesis), September 1999
- Referee, 1 paper, *Proceedings of the 7th INFORMS Computing Society Conference*, July 1999

Mailing List Administration

- **Owner**, June 2003 - present
SCHED-L, Scheduling research
- **Founder and Owner**, June 2003 - present
IOMEX-L, Operations research in Mexico
- **Founder and Owner**, January 2000 - present
PISIS-L, PISIS Faculty and students

Offices Held

- **Vice-President**, Latin-American Association on Operations Research (ALIO), 2002 -2004
- **U. of Texas Chapter President**, Omega Rho International Honor Society, 1993 - 97

Memberships: Current

- Institute for Operations Research and Management Sciences (INFORMS), 1995 - present
- INFORMS Computing Society, 1996 - present
- INFORMS Energy, Natural Resources and Environment Section, 2001 - present
- INFORMS Location Analysis Section, 2006 - present
- INFORMS Optimization Section, 2002 - present
- INFORMS Transportation Science and Logistics Section, 2004 - present
- Mathematical Programming Society, 1994 - present
- Mexican Institute for Operations Research and Systems, 2000 - present
- Omega Rho International Honor Society, 1992 - present
- Pipeline Simulation Interest Group, 1997 - present
- Society for Industrial and Applied Mathematics (SIAM), 1993 - present
- SIAM Activity Group on Optimization, 1993 - present

Conferences Attended

- 40th Mexican Mathematical Society Conference, Monterrey, México, 2007
- 8th EU/MEeting on Metaheuristics in the Service Industry. Stuttgart, Germany, 2007
- 1st Spanish Meeting on Evolutionary Algorithms and Metaheuristics (JAEM'07). Zaragoza, Spain, 2007
- 39th Mexican Mathematical Society Conference, Villahermosa, México, 2006
- 3rd International Workshop on Freight Transportation and Logistics (Odysseus), Altea, Spain, 2006
- 5th ALIO/EURO Conference on Combinatorial Optimization, ENST, Paris, France, 2005
- 4th Spanish Conference on Metaheuristics, Evolutive and Bioinspired Algorithms, Granada, Spain, 2005
- 2nd International Workshop on Hybrid Metaheuristics, Barcelona, Spain, 2005
- 12th Latin-Iberian-American Conference on Operations Research and Systems, Havana, Cuba, 2004
- International Conference on Cybernetics and Information Technologies, Systems and Applications, Orlando, 2004
- CORS/INFORMS Joint International Meeting, Banff, Canada, 2004
- 15th Annual POM Conference, Cancún, Mexico, 2004
- World-wide Logistics Meeting, Monterrey, México, 2004
- 1st Graduate Research Colloquium, FIME, UANL, San Nicolás de los Garza, México, 2003
- 7th Symposium on Informatics, Facultad de Contaduría y Administración, UAEM, Toluca, México, 2003
- 1st FIME Symposium on Operations Research and Systems, UANL, San Nicolás de los Garza, México, 2003
- 7th WSEAS International Conference on Systems, Corfu, Greece, 2003
- 1st FIME Conference on Engineering Applied Knowledge, UANL, San Nicolás de los Garza, México, 2003

- 13th National School on Optimization and Numerical Analysis, Saltillo, Mexico, 2003
- 11th Latin-Iberian-American Conference on Operations Research, Concepción, Chile, 2002
- 10th International Symposium on Computer Systems, Saltillo, México, 2002
- 12th International Conference on Industrial Engineering, Nuevo Laredo, México, 2002
- IEEE International Conference on Systems, Man, and Cybernetics, Tucson, 2001
- 11th International Conference on Industrial Engineering, Nuevo Laredo, México, 2001
- INFORMS National Meeting, San Antonio, 2000
- 32nd PSIG Meeting, Savannah, 2000
- 10th Latin-American Conference on Operations Research and Systems, México City, 2000
- 7th INFORMS Computing Society Conference, Cancún, México, 2000
- 6th SIAM Conference on Optimization, Atlanta, 1999
- 30th PSIG Meeting, Denver, 1998
- INFORMS National Meeting, Seattle, 1998
- SIAM Annual Meeting, Toronto, Canada, 1998
- 6th International IPCO Conference, Houston, 1998
- INFORMS National Meeting, Montreal, Canada, 1998
- NSF Design & Manufacturing Grantees Conference, Monterrey, México, 1998
- INFORMS National Meeting, Dallas, 1997
- 29th PSIG Meeting, Tucson, 1997
- INFORMS National Meeting, San Diego, 1997
- 7th International Conference on Industrial Engineering, Nuevo Laredo, México, 1997
- 2nd University of Texas Student Research Conference, Austin, 1996
- Stochastic Programming Tutorial, Tucson, 1996
- 1st University of Texas Student Research Conference, Austin, 1995
- INFORMS National Meeting, New Orleans, 1995
- 21st Mexican Mathematical Society Conference, Hermosillo, México, 1988
- 31st Mexican Physics Society Annual Meeting, Monterrey, México, 1988
- 17th Mexican Mathematical Society Conference, Guanajuato, México, 1983

COURSE BACKGROUND

Relevant Coursework

- **Optimization:** Linear programming, network flow programming, integer programming, mixed-integer programming, nonlinear programming, dynamic programming, combinatorial optimization, large-scale system optimization, sequencing and scheduling
- **Probability:** Probability and statistics, simulation, stochastic processes, stochastic programming, mathematical statistics, analysis and design of experiments, quality control, time series analysis
- **Computer Science:** Probabilistic analysis of algorithms, parallel algorithms for matrix computations, data structures in C/C++

Workshops / Seminars

- **Location Analysis Tutorial**, April 2006
20-hr short course, UPC, Barcelona, Spain. Instructor: Gilbert Laporte
- **Workshop: COIN-OR: Software Tools for Optimization**, May 2004
CORS/INFORMS Joint International Meeting, Banff, Canada. Instructors: Ted Ralphs, Matthew Saltzman, J. Fasano, Alan King, Lou Hafer, and Steven Henderson
- **Research at UANL and CONACYT Support Programs**, March 2001
Center for Support and Academic Service, UANL, Monterrey, México.
- **Workshop: OR in the Deregulated Power Industry**, October 1997
Instructor: Robert Entriken. INFORMS National Meeting, Dallas.
- **Natural Gas 101**, July 1997
3-day workshop, Energy Seminars, Inc., Houston.

- **Stochastic Programming Tutorial**, January 1996
2-day tutorial, U. of Arizona, Dept. of Systems and Industrial Engineering, Tucson.
- **Statistical Quality Control**, August 1990
SABA Statistical Consulting, Monterrey, México.

Tutorials

- **Hybridizing Metaheuristics: The road to success in problem solving!?!**, October 2007
Instructor: Stefan Voß. 8th EU/MEeting on Metaheuristiccs in the Service Industry. Stuttgart, Germany.
- **Metaheuristics in interactive multiple objective optimization**, October 2007
Instructor: Andrzej Jaskiewicz. 8th EU/MEeting on Metaheuristiccs in the Service Industry. Stuttgart, Germany.
- **Advances in Modeling and Solving Mathematical Programming Problems**, October 2005
Instructor: Soffian Oussedik. 5th ALIO/EURO Conference on Combinatorial Optimization, Paris, France.
- **Memetic Algorithms**, September 2005
Instructor: Carlos Cotta. IV MAEB'05, Granada, Spain.
- **OR Challenges in Forestry Resource Problems**, October 2004
Instructor: Andrés Weintraub. CLAIO XII, Havana, Cuba.
- **Level Packing in Two Dimensions**, October 2004
Instructor: Silvano Martello. CLAIO XII, Havana, Cuba.
- **Creating Competitive Advantage Using Operations Research**, May 2004
Instructor: Thomas M. Cook. CORS/INFORMS Joint International Meeting, Banff, Canada.
- **The New World of International Trade**, May 2004
Instructor: Ralph E. Gomory. CORS/INFORMS Joint International Meeting, Banff, Canada.
- **Stochastic Programming**, May 2004
Instructor: François V. Louveaux. CORS/INFORMS Joint International Meeting, Banff, Canada.
- **Operational Research in Telecommunications**, May 2004
Instructor: Brigitte Jaumard. CORS/INFORMS Joint International Meeting, Banff, Canada.
- **Online Optimization**, May 2004
Instructor: Patrick Jaillet. CORS/INFORMS Joint International Meeting, Banff, Canada.
- **Optimization through Collaborative Transportation**, February 2004
Instructor: Garland Chow. World Logistics Meeting, Monterrey, México.
- **Scatter Search: Methodology and Applications**, May 2003
Instructor: Manuel Laguna. PISIS, UANL, México.
- **Staff Scheduling at USPS Mail Processing & Distribution Centers**, March 2003
4-hr short-course. Instructor: Jonathan F. Bard. PISIS, UANL, México.
- **Operational Research Approaches to Genome Mapping**, October 2002
Instructor: Jacek Blazewicz. CLAIO XI, Concepción, Chile.
- **Transportation, Planning, Models, Achievements, and Challenges**, October 2002
Instructor: Michael Florian. CLAIO XI, Concepción, Chile.
- **Scatter Search: Methodology and Applications**, October 2002
Instructor: Manuel Laguna. CLAIO XI, Concepción, Chile.
- **Simulation-Based Optimization**, October 2002
Instructor: Averill M. Law. CLAIO XI, Concepción, Chile.
- **Models and Algorithms for the Train Timetabling Problem**, October 2002
Instructor: Paolo Toth. CLAIO XI, Concepción, Chile.
- **Column Generation in Integer Linear Programming and Applications**, October 2002
Instructor: Nelson Maculan. CLAIO XI, Concepción, Chile.
- **Reusable Software Components for Heuristic Search: HotFrame**, January 2000
Instructors: David L. Woodruff and Stefan Voss. 7th INFORMS Computing Society Conference, Cancún, México.
- **Computational Global Optimization: Algorithms and Applications**, January 2000
Instructor: Janos D. Pinter. 7th INFORMS Computing Society Conference, Cancún, México.
- **An Industrial Perspective on Optimization**, May 1999
Instructor: John T. Betts. 6th SIAM Conference on Optimization, Atlanta.
- **Advances in Formulation and Solution of Difficult Combinatorial Optimization Problems**, May 1999

- Instructor: Karla L. Hoffman. 6th SIAM Conference on Optimization, Atlanta.
- **Approximation Algorithms via Linear Programming**, October 1998
Instructor: David Shmoys. INFORMS National Meeting, Seattle.
- **An Introduction to Tabu Search**, April 1998
Instructor: Michel Gendreau. INFORMS National Meeting, Montreal.
- **Branch and Cut and Price**, April 1998
Instructor: George L. Nemhauser. INFORMS National Meeting, Montreal.
- **Lift and Project Methods for Mixed-Integer Programming**, April 1998
Instructor: Sebastián Ceria. INFORMS National Meeting, Montreal.
- **Column Generation Methods**, April 1998
Instructor: Jacques Desrosiers. INFORMS National Meeting, Montreal.
- **Large Scale Problem Reformulation**, October 1997
Instructor: Hanif Sherali. INFORMS National Meeting, Dallas.
- **Heuristics for Hard Scheduling Problems**, October 1997
Instructor: Jan K. Lenstra. INFORMS National Meeting, Dallas.
- **Computational Issues in Combinatorial Optimization**, October 1997
Instructor: Bill Cook. INFORMS National Meeting, Dallas.
- **Lagrangian Relaxation, Extensions & Applications**, October 1997
Instructor: Monique Guegnard. INFORMS National Meeting, Dallas.
- **Global Optimization**, May 1997
Instructor: Cris Floudas. INFORMS National Meeting, San Diego.
- **Machine Scheduling**, October 1995
Instructor: Michael Pinedo. INFORMS National Meeting, New Orleans.
- **Tabu Search**, October 1995
Instructors: Fred Glover and Manuel Laguna. INFORMS National Meeting, New Orleans.

COMPUTER SKILLS

Programming Languages: C++, C, FORTRAN, BASIC.

Mainframes: UNIX (and compatible), VAX/VMS, IBM/VM operating systems.

Microcomputers: PC (Linux, MS-Windows, MS-DOS), Macintosh.

Optimization Software: CPLEX, OSL, GRG2, GAMS, MINTO, MATLAB.

Miscellaneous: System administration of IBM RS/6000 and Sun workstations, mailing list administration, world-wide web page design and development.

PERSONAL INFORMATION

DOB: April 1966
Birthplace: Monterrey, México
Marital status: Married (to Ofelia Rodríguez, August 1992)
Children: A girl (Aleida Shaní, born February 1999) and two boys (Biali Joan, born January 2007, and Vandari Pavel, born March 1996)
Languages: Spanish (native) and English (100%)

REFERENCES

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NOTATION

UANL: Universidad Autónoma de Nuevo León
CONACYT: Consejo Nacional de Ciencia y Tecnología (Mexican National Council for Science and Technology)