

MIGUEL J. BAGAJEWICZ

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EDUCATION

- * **Ph.D. IN CHEMICAL ENGINEERING:** California Institute of Technology (Caltech), 1987.
- * **MASTER OF SCIENCE IN CHEMICAL ENGINEERING:** Caltech, 1984.
- * **CHEMICAL ENGINEER:** Universidad Nacional del Litoral, Argentina, 1977.

PRESENT POSITION

- * **Director.** Center for Engineering Optimization. University of Oklahoma.
- * **Professor.** Department of Chem. Eng. and Materials Science. University of Oklahoma.

AREAS OF EXPERTISE

- **Process Plant Data Management:** Data Reconciliation and Fault Analysis, **Process Engineering:** Energy Integration. Crude Fractionation, Water reuse and allocation planning. **Optimization Theory:** Algorithm development and Process Design applications. **Investment Planning** and Project Evaluation: With emphasis on Financial risk. **Product Design.**

BOOKS

- Bagajewicz M. *Smart Process Plants: Software and Hardware for Accurate Data and Profitable Operations.* McGraw Hill. To appear, November 2009.
- Bagajewicz M. *Design and Upgrade of Process Plant Instrumentation.* (ISBN:1-56676-998-1), Technomic Publishing Company, PA. <http://www.techpub.com>, (2000).

SELECTED REFERRED PUBLICATIONS (2002-2009 out of a total of 200)

1. Whitnack C., A. Heller, M. T. Frow, S. Kerr and M. Bagajewicz. *Financial Risk Management in the Design of Products under Uncertainty.* Comp. Chem. Eng. Vol. 33, No 5, pp. 1056–1066 (2009).
2. Faria D. C. and M. Bagajewicz. *Profit-based Grassroots Design and Retrofit of Water Networks in Process Plants.* Computers and Chemical Engineering. Vol. 33, No 2, 436–453(2009).
3. Guyonnet, P., H. Grant and M. Bagajewicz. *Integrated Model for Refinery Planning Oil Procuring and Product Distribution.* Industrial and Engineering Chemistry Research. Vol 48, No 1, 463–482 (2009).
4. Bagajewicz. *On the use of net present value in investment/capacity planning models.* Industrial and Engineering Chemistry Research. Vol 47, No 23, pp. 9413-9416 (2008).
5. Miloš Bogataj and M. Bagajewicz. *Synthesis of Non-isothermal Heat Integrated Water Networks in Chemical Processes.* Computers and Chemical Engineering. Vol 32, No 12, pp. 3130–3142 (2008).
6. Lakkhanawat H. and M. Bagajewicz. *Financial Risk Management with Product Pricing in the Planning of Refinery Operations.* Ind. and Eng. Chem. Res. Vol 47, No 17, 6622-6639 (2008).
7. Nguyen, D. and M. Bagajewicz. *Design of Nonlinear Sensor Networks for Process Plants.* Industrial and Engineering Chemistry Research. Vol 47, No 15, 5529-5542 (2008).
8. Nguyen D., C. Brammer and M. Bagajewicz. *New Tool for the Evaluation of the Scheduling of Preventive Maintenance for Chemical Process Plants.* IECR. Vol 47, No 6, 1910-1924 (2008).
9. Bagajewicz M. and DuyQuang Nguyen. *Stochastic-Based Accuracy of Data Reconciliation Estimators for Linear Systems.* Computers and Chemical Engineering. Vol. 32, 6, 1257–1269, (2008).
10. Nguyen D., C. Brammer and M. Bagajewicz. *A New Tool for the Evaluation of the Scheduling of Preventive Maintenance for Chemical Process Plants.* Ind. & Eng. Chem. Res. Vol 47, No 6, (2008).
11. Street C., J. Woody, J. Ardila and M. Bagajewicz. *Product Design: A Case Study of Slow Release Carpet Deodorizers/Disinfectants.* Ind. and Eng. Chem. Res., Vol 47, No 4, 1192-1200 (2008).
12. Janjira S., R. Magaraphan and M. Bagajewicz. *Simultaneous Treatment of Environmental and Financial Risk in Process Design under Uncertainty.* Int. J. of Env. and Pollution. Vol. 29 No 1/2/3. (2007).
13. Gala M and M. Bagajewicz. A. Industrial and Engineering Chemistry Research. *Efficient Procedure for the Design and Upgrade of Sensor Networks using Cutsets and Rigorous Decomposition* Industrial and Engineering Chemistry Research, Vol 45, No 21, pp. 6687-6697 (2006).
14. Pongsakdi A., K. Siemanond, P. Rangsunvigit and M. Bagajewicz. *Financial Risk Management in Refinery Operations Planning under Uncertainty.* Int. J. of Production Economics, 103, 1, 64-86 (2006).
15. Bagajewicz M. *Value of Accuracy in Linear Systems.* AIChE J.. Vol 52, No 2., pp. 638-650 (2006).

16. Barbaro A. and M. Bagajewicz. *New Rigorous One-Step MILP Formulation for Heat Exchanger Network Synthesis*. Computers and Chemical Engineering. Vol 29, 9, pp. 1945-1976 (2005).
17. Benqlilou C., E. Musulin, M. Bagajewicz, L. Puigjaner. *Instrumentation Design based on Optimal Kalman Filtering*. Journal of Process Control. Vol. 15 pp. 629-638 (2005).
18. Guillén G., F. D. Mele, M. Bagajewicz, A. Espuña and L. Puigjaner. *Multiobjective Supply Chain Design under Uncertainty*. Chemical Engineering Science, Vol. 60, No 6, pp.1535-1553 (2005).
19. Bagajewicz M. *On the Definition of Software Accuracy in Redundant Measurement Systems*. AIChE Journal. Vol 51, No 4., pp. 1201-1206 (2005).
20. Guillén G., M. Bagajewicz, S. E. Sequeira, A. Espuña and L. Puigjaner. *Management of pricing policies and financial risk as a key element for short term scheduling optimization*. Industrial and Engineering Chemistry Research. Vol 44., No 3, pp. 557-575 (2005).
21. Guillén G., F. D. Mele, M. Bagajewicz, A. Espuña and L. Puigjaner. *Multiobjective Supply Chain Design under Uncertainty*. Chemical Engineering Science, Vol. 60, No 6, pp.1535-1553 (2005).
22. Guillén G., M. Bagajewicz, S. Sequeira, A. Espuña and L. Puigjaner. *Management of pricing policies and financial risk as a key element for short term scheduling optimization*. IECR. Vol 44., No 3 (2005).
23. Aseeri A., P. Gorman and M. Bagajewicz. *Financial Risk Management in Offshore Oil Infrastructure Planning and Scheduling*. Ind. & Eng. Chem. Res. 43, No 12, pp. 3063-3072 (2004).
24. Barbaro A. F. and M. Bagajewicz. *Managing Financial Risk in Planning under Uncertainty*. AIChE Journal. Vol 50, No 5., pp. 963-989 (2004).
25. Bonfill A., M. Bagajewicz, A. Espuña and L. Puigjaner. *Risk Management in Scheduling of Batch Plants under Uncertain Market Demand*. IECR, 43, No 9, pp. 2150-2159 (2004).
26. Savelski M. and M. Bagajewicz. *On the Necessary Conditions of Optimality of Water Utilization Systems in Process Plants with Multiple Contaminants*. Chem.Eng. Sc. Vol 58, No 23-24, (2003).
27. Bagajewicz M. and E. Cabrera. *Data Reconciliation in Gas Pipeline Systems*. Industrial and Engineering Chemistry Research. Vol. 42, No 22, pp. 5596-5606 (2003).
28. Bagajewicz M. and A. F. Barbaro. *Financial Risk Management in the Planning of Energy Recovery in the Total Site*. Industrial and Engineering Chemistry Research. Vol. 42, No 21, pp. 5239-5248 (2003).
29. Bagajewicz M., A. F. Barbaro. *On the Use of Heat Pumps in Total Site Heat Integration*. Computers and Chemical Engineering. Vol. 27, No 11 , pp. 1707-1719 (2003).
30. Koppol A., M. Bagajewicz, B. J. Dericks and M. J. Savelski. *On Zero Water Discharge Solutions in the Process Industry*. Advances in Environmental Research, Vol. 8, No 2, pp. 151-171 (2003).
31. Bagajewicz M. and J. Soto. *Rigorous Procedure for the Design of Conventional Atmospheric Crude Fractionation Units. Part III: Trade-Off between Complexity and Energy Savings*. Industrial and Engineering Chemistry Research. 42, 6, pp. 1196-1203 (2003).
32. Ji S. and M. Bagajewicz. *Design of Crude Distillation Plants with Vacuum Units. Part I: Targeting*. Industrial and Engineering Chemistry Research. 41, 24, pp. 6094-6099 (2002).
33. Ji S. and M. Bagajewicz. *Design of Crude Distillation Plants with Vacuum Units. Part II: Heat Exchanger Network*. Industrial and Engineering Chemistry Research. 41, 24, pp. 6100-6106 (2002).
34. Ji S. and M. Bagajewicz. *On the Energy Efficiency of Stripping-Type Crude Distillation*. Industrial and Engineering Chemistry Research. 41, 23, pp. 5819-5825 (2002).
35. Bagajewicz M. and H. Roderer. *Multiple Plant Heat Integration in the Total Site*. AIChE J. Vol. 48, No. 10, pp. 2255-2270. (2002).
36. Bagajewicz M. and E. Cabrera. *A New MILP Formulation for Instrumentation Network Design and Upgrade*. AIChE J. Vol. 48, No. 10, pp. 2271-2282. (2002).
37. Bagajewicz M. and S. Ji. *Rigorous Targeting Procedure for the Design of Crude Fractionation Units with Pre-Flashing or Pre-Fractionation*. IECR, 41, 12, pp. 3003-3011 (2002).
38. Bagajewicz M., H. Roderer and M. Savelski. *Energy Efficient Water Utilization Systems in Refineries and Process Plants*. Computers and Chemical Engineering. Vol. 26, No 1, pp. 56-79 (2002).

TEACHING

- * University of Oklahoma: *Design I, Capstone Process Design. Thermodynamics. Graduate Applied Math, Graduate Process Synthesis* (1996-)
- * Pan American Advanced Studies Institute (PASI) Program on Process Systems Engineering. *Lecturer on Energy Integration (Graduate Class). Iguazu Falls, August 2005.*

- * UPSA (Universidad Privada de Santa Cruz de la Sierra), Santa Cruz Bolivia. *Financial Risk Management. (One week Graduate Class). May 2005.*
- * UPSA (Universidad Privada de Santa Cruz de la Sierra), Santa Cruz Bolivia. *Oil and Gas Process Engineering (One week Graduate Class). December 2004.*
- * Chulalongkorn University-Thailand. Visiting Lecturer: *Process Simulation and Design. (Two weeks Graduate Class). October 2003 and October 2004*
- * UCLA. Visiting Lecturer: *Process Economics and Process Design. January-June 1995.*
- * INTEC-Argentina. *Chemical Engineering graduate and undergraduate courses. (1988-1989).*

Industrial Short Courses

- * **ConocoPhillips.** Energy Integration-Pinch Technology. November 2007.
- * **Chulalongkorn University, Bangkok, Thailand.** Financial Risk Management in Process Operations Scheduling and Project Investment Planning (2 days Short course). Oct. 2004. Petroleum Fractionation: Simulation, Optimal Operations, Energy Efficiency and Retrofit (2 days Short course). Oct. 2003.
- * **Colombian Chemical Engineering Association. Bucaramanga, Colombia.** Process Design and Planning Under Uncertainty. (2 days Short course). August 2003.
- * **Pemex. Ciudad del Carmen, Mexico.** Principles of Data Reconciliation (7 Short course). September 2002. Principles of Data Reconciliation (7 Short course). July 2002.
- * **Conoco. Ponca City, Oklahoma, USA.** Heat Integration (3 days Short course). July 2000.
- * **Ecopetrol. Bucaramanga, Colombia.** Heat Integration (2 days Short course). Nov, 2000. Principles of Data Reconciliation (3 days Short course). Nov. 2000.
- * **Ecopetrol. Cartagena, Colombia.** Principles of Data Reconciliation (3 days Short course). Sept 1998.

INDUSTRIAL EXPERIENCE

- # (1992-1995) Software development for Plant Data Reconciliation and Process Simulation. (At SimSci)
- # (1989-1992) Development of Novel Design Methods of Mass-Exchange Networks for Waste Minimization and Cost Effective/ Energy Efficient Distillation Networks. (At UCLA)
- # (1987-1989) a) Development of Design Methods for Steam and Power Systems. b) Revision of the Basic Engineering of a H₂O₂ New Plant. (At INTEC, Argentina)
- # (1982-1987) High Temperature Gas Desulfurization using metal oxides. Experiments were done using different sorbents in fixed beds. Modeling work of gas-solid reactions in pellets and fixed bed reactors was also included. (At Caltech)
- # (1980-1982) Studies of Existing Plant Energy Revamping were done for local Industries in Argentina.
- # (1976-1980) Basic Engineering and supervision of the Detailed Engineering of a Heavy Water Plant in Argentina. Development of a Process Simulator. Design of the lay-out, pumping and control specification and P&I diagram preparation. About 14 reports produced. (Intec)

OTHER POSITIONS AND AWARDS

- * Associate Editor : International Journal of Chemical Engineering
- * Editorial Advisory Board. Industrial and Engineering Chemistry Research (2005-2008).
- * Regents Award for Superior Research Activities. University of Oklahoma (2003)
- * Presidential Professorship. University of Oklahoma (2001-)
- * Head of the Start-Up Group. Heavy Water Plant Project. Intec-Argentina (1982)
- * Head of *Process Simulation*. Industrial Extension Unit. Intec-Argentina (1981-1982).
- * Research Fellow. Argentine Atomic Energy Commission. (1978).
- * Argentine National Research Council and Inter American Development Bank Fellowship. (1982-1987).

PARTICIPATION IN CONGRESSES

- More than 250 papers sent to various Congresses (AIChE, PSE, IFAC and ESCAPE, PRESS).
- Member of the scientific Committee of various conferences (ESCAPE, PRES, FOCAP, etc.)

COMPLETE CV @ <http://www.ou.edu/class/che-design/index.htm>