

**CURRICULUM VITAE**

***DALE EDWARD SEBORG***

**ADDRESS:** Dept. of Chemical Engineering  
University of California  
Santa Barbara, California 93106-5080

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**PRESENT POSITION:**

Professor of Chemical Engineering, University of California, Santa Barbara

**PERSONAL:**

Place of Birth: Madison, Wisconsin, March 29, 1941  
Citizenship: United States

**EDUCATION:**

B.Sc., Chemical Engineering, University of Wisconsin (1964)  
Ph.D., Chemical Engineering, Princeton University (1969)

**AWARDS:**

- 1994 *Statistics in Chemistry Award*, American Statistical Association (shared with W.E. Larimore, A. Kemna, C.D. Schaper and D.A. Mellichamp).
- 1993 *Education Award*, American Automatic Control Council.
- 1992 *Tau Beta Pi Teaching Award* for the Dept. of Chemical and Nuclear Engineering, UCSB.
- 1990 *Meriam-Wiley Distinguished Author Award*, American Society of Engineering Education (shared with T.F. Edgar and D.A. Mellichamp).
- 1980 *Technical Achievement Award*, Southern California Section of the American Institute of Chemical Engineers.
- 1973 *Best Paper Award*, 1973 Joint Automatic Control Conference, Columbus, OH (shared with R.G. Wilson and D.G. Fisher).

**HONORARY LECTURES:**

- Semi-Plenary Lecture, 1999 European Control Conference, Karlsruhe, Germany (September, 1999).
- Plenary Lecture, 12th Brazilian Congress on Chemical Engineering, Porto Alegre, Brazil (September, 1998).
- Plenary Lecture, Control '94 Conference, Coventry, UK (March, 1994).
- Plenary Lecture, Canadian Chemical Engineering Conference, Toronto, (October, 1992).
- Keynote Speaker, Australian Chemical Engineering Conference (CHEMECA 85), Perth (August, 1985).
- Karahash Visiting Professor Lectures, Lehigh University (April 15-16, 1985).

**EXPERIENCE:****University:**

UCSB	Professor	1977-
UCSB	Department Chair	1978-81
Alberta	Professor	1975-77
Alberta	Associate Professor	1970-75
Alberta	Assistant Professor	1968-70
Princeton	Teaching/Research Assistant	1964-68

**Other:**

DuPont Company (sabbatical leave)	1998
Monsanto Company (summer) Research and Development	1965
Ethyl Corporation (summer) Research and Development	1964

**Editorial Boards:**

Editorial Board, <i>IEE Proc. on Control Theory and Applications (UK)</i>	1994-
Associate Editor, <i>Internat. J. of HVAC&amp;R Research</i>	1994-98
Editorial Advisory Board, <i>Int. Journal of Adaptive Control and Signal Processing</i>	1987-97
Associate Editor at Large, <i>IEEE Trans. Automatic Control</i>	1987-90
Editorial Advisory Board, <i>Chemical Engineering Communications</i>	1971-76

**Consulting:**

Industrial consultant on process modeling, control, and monitoring	1974-
Member, Technology Advisory Board, Pavilion Technologies Inc., Austin, TX	1995-00
External Examiner, Ph.D. Examination Committees University of Waterloo, 1971; University of Calgary, 1973; McGill University, 1977; University of British Columbia, 1991; I.I.T. Kanpur, 1993; University of Calgary, 1997; Helsinki University of Technology, 2001.	

**Short Courses:**

Introductory and advanced courses on Process Dynamics, Control, Identification, and Monitoring (30 course offerings in Australia, China, Germany, Japan, Korea, Kuwait, Mexico, and the USA.)

**PROFESSIONAL ACTIVITIES:****American Institute of Chemical Engineers (AIChE):**

Chair, Programming Board for Computing and Systems Technology (CAST) Division	1984-86
Director, CAST Division	1981-83, 86-89
Society Delegate, American Automatic Control Council	1980-82
Chair, Systems and Process Control Group, National Program Committee	1977-79
Society Delegate, Program Committees for 1977 and 1978 Joint Automatic Control Conferences	1977-78
Session Chair or Co-Chair at Annual Meetings	1975-97

**American Control Conferences:**

General Chair, 1992 American Control Conference	1988-92
Finance Chair, 1983 American Control Conference	1981-83
Session Chair, American Control Conferences	1982-02

**Chemical Process Control (CPC) Conferences:**

Session Chair, CPC-5, Lake Tahoe, CA (Feb., 1996)	1995-96
Organizing Committee, CPC-4, South Padre Island, TX (Jan., 1991)	1989-91
Organizing Committee, CPC-3, Pacific Grove, CA (Jan., 1986)	1985-86
Conference Co-organizer, CPC-2, Sea Island, GA (Jan., 1981)	1979-81
Organizing Committee, CPC-1, Pacific Grove, CA (Jan., 1976)	1974-76

**American Society for Engineering Education:**

Director, Chemical Engineering Division	1981-84
Chair, Local Arrangements Committee, 1982 Summer School for Chemical Engineering Faculty, UCSB	1981-82

**International Federation of Automatic Control (IFAC):**

International Program Committee, DYCOPS-6 Sympos., Chejudo Island, Korea, June 2001	2001
International Program Committee, 4 <sup>th</sup> Workshop on On-Line Fault Detection, Chejudo Island, Korea, June 2001	2001
Co-chair, National Organizing Committee, SYSID 2000, Santa Barbara, June, 2000	1998-00
International Program Committee, DYCOPS '98, Corfu, Greece, June, 1998	1997-98
International Program Committee, ADCHEM '97, Banff, Canada, June, 1997	1995-97
Member, Technical Committee on Adaptive Systems in Control and Signal Processing	1994-97
Co-chair, International Program Committee, ADCHEM '94, Kyoto, May 1994	1993-94
International Program Committee, Intelligent Tuning and Adaptive Control, Singapore, January 1991	1989-91
Member, Working Group on Chemical Process Control	1984-91
Chair, International Program Committee, ADCHEM '88 Symposium, Copenhagen, Denmark, August 1988	1986-88
International Program Committee, Workshop on Adaptive Control of Chemical Processes, Frankfurt, FRG, October 1985	1985
Session Chair, 9th World Congress, Budapest, Hungary, July, 1984	1984
International Program Committee, 4th IFAC Conference on Digital Applications to Process Control, The Hague, Netherlands, June, 1977	1976-77
Session Chair, 3rd IFAC Conference on Digital Computer Applications to Process Control, Zürich, Switzerland, March, 1974	1974

**Canadian Society for Chemical Engineering**

Session Chair, 35th Canadian Chemical Engineering Conference, Calgary, October 1985	1985
Organizing Committee, 27th Canadian Chemical Engineering Conference, Calgary, October, 1977	1976-77
Editor, <i>Directory of Chemical Engineering Research in Canadian Universities</i> , 14th, 15th and 16th editions	1974-77
Vice-Chair, 19th Canadian Chemical Engineering Conference, Edmonton, October, 1969	1969

**Miscellaneous:**

International Program Committee, ADNP International Program Committee, UKACC Control'96, Control'98	1995-98
International Program Committee, PSE '94, Kyongju, South Korea, May 1994	1993-94
Computer Aids to Chemical Engineering (CACHE): Real-Time Task Force	1971-76

**UNIVERSITY COMMITTEES:****University of California, Systemwide Committees**

Committee on Academic Personnel	1987-88
Chair, Review Committee, Department of Applied Mechanics and Engineering Science, UC San Diego	1984

**University of California, Santa Barbara**

Task Force on Senate Reorganization	2000-01
Education Abroad Committee	1996-
Chancellor Search Committee	1993-94
Program Review Panel	1992-96
Chair	1993-96
Committee on Committees	1990-92
Committee on Academic Personnel	1985-88
Vice-Chair	1986-87
Chair	1987-88
Vice Chancellor Search Committee	1986
Dean of Engineering Search Committee	1982-83
Committee on Educational Policy and Academic Planning	1981-84
Vice-Chair	1982-84
Executive Committee, College of Engineering	1978-81
Computer Science Joint Task Force	1978

**University of Alberta**

Director: Data Acquisition, Control and Simulation Centre	1971-76
University Computer Committee	1971-74
Engineering Faculty Council: (major committees only)	
Nominating Committee	1976-77
Salaries and Promotions Committee	1974
Curriculum Committee	1972
Selection Committee for Chair of the Mineral Engineering Department	1974
University of Alberta Faculty Club:	
Executive Committee	1974-77
Secretary	1977

**TEACHING EXPERIENCE:****Sophomore Year:**

Material and Energy Balances

**Junior Year:**

Statistical Applications in Chemical Engineering  
Heat Transfer  
Chemical Engineering Laboratory

**Senior Year:**

Process Dynamics  
Process Control  
Computer Applications in Process Control  
Chemical Engineering Laboratory

**Graduate:**

Advanced Process Dynamics  
Advanced Process Control

**GRADUATE STUDENTS SUPERVISED or CO-SUPERVISED:**

Ph.D. theses: 22  
M.S. theses: 38

**LIST OF PUBLICATIONS**

(\* denotes refereed paper)

**Books**

Henson, M.A. and D.E. Seborg (ed.), *Nonlinear Process Control*, Prentice-Hall, Englewood Cliffs, N.J. (1997).

Seborg, D.E., T.F. Edgar, and D.A. Mellichamp, *Process Dynamics and Control*, John Wiley & Sons, New York (1989). Translated into Korean (1995) and Japanese (1996).

Edgar, T.F. and D.E. Seborg (ed.), *Chemical Process Control-II*, Engineering Foundation, New York (1982).

Fisher, D.G. and D.E. Seborg, *Multivariable Computer Control: A Case Study*, American Elsevier, New York (1976).

**Patent**

Seborg, D.E. and T. Miao, "Automatic Detection of Excessively Oscillatory Feedback Control Loops", U.S. patent # 5,719,788, awarded February 17, 1998.

**Papers Published**

1. Seborg, D.E. and D.B. Robinson, "Chemical and Petroleum Engineering at the University of Alberta," *Chemistry in Canada*, **21**, (7), 23-24 (1969).
- 2.\* Seborg, D.E. and E.F. Johnson, "Construction of Regions of Stability for Nonlinear Systems Containing Time Delays," *Internat. J. of Control*, **12**, 961-976 (1970).
- 3.\* Seborg, D.E., "Stability of Chemical Reactors in the Presence of Sustained Disturbances," *Can. J. Chem. Eng.*, **49**, 535-540 (1971).

4. Seborg, D.E. and D.G. Fisher, "Multivariable Computer Control," *Gas Processing/Canada*, **63**, (4), 36-41 (1971).
- 5.\* Seborg, D.E., "Comments on 'Bounded-Input, Bounded-Output Stability of Chemical Reactors,'" (Correspond.) *Automatica*, **7**, 761-762 (1971).
- 6.\* Seborg, D.E. and E.F. Johnson, "Stability of Nonlinear Systems Containing Time Delays and/or Sampling Operations," *AIChE J.*, **17**, 872-879 (1971).
- 7.\* Nieman, R.E., D.G. Fisher and D.E. Seborg, "A Review of Process Identification and Parameter Estimation Techniques," *Internat. J. of Control*, **13**, 209-264 (1971).
8. Seborg, D.E., Letter to the Editor, *Can. J. Chem. Eng.*, **50**, 440 (1972).
- 9.\* Newell, R.B., D.G. Fisher and D.E. Seborg, "Computer Control Using Optimal Multivariable Feedforward-Feedback Algorithms," *AIChE J.*, **18**, 976-984 (1972).
- 10.\* Wilson, R.G., D.G. Fisher and D.E. Seborg, "Model Reduction for Discrete-Time Dynamic Systems," *Internat. J. of Control*, **16**, 549-588 (1972).
- 11.\* Seborg, D.E. and D.G. Fisher, "Computer-Aided Student Experiments at the University of Alberta," Proc. ASEE Summer School for Chem. Eng. Faculty, pp. 93-110, Boulder, Colorado (August, 1972).
- 12.\* Alevisakis, G. and D.E. Seborg, "An Extension of the Smith Predictor Method to Multivariable Systems Containing Time Delays," *Internat. J. Control*, **17**, 541-551 (1973).
- 13.\* Hamilton, J.C., D.E. Seborg and D.G. Fisher, "An Experimental Evaluation of Kalman Filtering," *AIChE J.*, **19**, 901-910 (1973).
- 14.\* Oliver, W.K., D.E. Seborg and D.G. Fisher, "Model Reference Adaptive Control Based on Liapunov's Direct Method. Part I: Theory and Control System Design," *Chem. Eng. Communications*, **1**, 125-132 (1973).
- 15.\* Oliver, W.K., D.E. Seborg and D.G. Fisher, "Model Reference Adaptive Control Based on Liapunov's Direct Method. Part II: Hybrid Computer Simulation and Experimental Verification," *Chem. Eng. Communications*, **1**, 133-140 (1973).
- 16.\* Topaloglu, T. and D.E. Seborg, "A Note on Pole Assignment," *IEEE Trans. Auto. Control*, **AC-19**, 94 (1974).
17. Fisher, D.G. and D.E. Seborg, "Advanced Computer Control Improves Process Performance," *Instrument. Technol.*, **20**, (9), 71-77 (1973).
- 18.\* Wilson, R.G., D.E. Seborg and D.G. Fisher, "Modal Approach to Control Law Reduction," Proc. 1973 Joint Automatic Control Conference, pp. 554-565, Columbus, Ohio (June, 1973).
- 19.\* Alevisakis, G. and D.E. Seborg, "Control of Multivariable Systems Containing Time Delays Using a Multivariable Smith Predictor," *Chem. Eng. Science*, **29**, 373-380 (1974).
- 20.\* Oliver, W.K., D.E. Seborg and D.G. Fisher, "Hybrid Simulation of a Computer-Controlled Evaporator," *Simulation*, **25**, (9), 77-84 (1974).
- 21.\* Wilson, R.G., D.G. Fisher and D.E. Seborg, "Model Reduction and the Design of Reduced-Order Control Laws," *AIChE J.*, **20**, 1131-1140 (1974).
- 22.\* Park, H. and D.E. Seborg, "Eigenvalue Assignment Using Proportional-Integral Feedback Control," *Internat. J. Control*, **20**, 517-523 (1974).
- 23.\* Shah, S., D.G. Fisher and D.E. Seborg, "Disturbance Localization in Linear Time-Invariant Multivariable Systems," *Electronics Letters*, **10**, 513 (1974).
- 24.\* Fisher, D.G., D.E. Seborg and R.B. Newell, "Improved Process Performance via Advanced Computer Control Techniques," Proc. National Chemical Eng. Conference, pp. 187-197, Surfer's Paradise, Queensland, Australia (July, 1974).

- 25.\* Seborg, D.E., D.G. Fisher and J.C. Hamilton, "An Experimental Evaluation of State Estimation in Multivariable Control Systems," *Automatica*, **11**, 351-359 (1975).
- 26.\* Shah, S.L., D.G. Fisher and D.E. Seborg, "Eigenvalue/Eigenvector Assignment for Multivariable Systems and Further Results for Output Feedback Control," *Electronics Letters*, **11**, 388-389 (1975).
27. Seborg, D.E. (editor), *Annual Directory of Chemical Engineering Research in Canadian Universities*, 14th edition, published by *Can. Soc. Chem. Eng.*, Ottawa (1975).
28. Seborg, D.E., "Increased Graduate Student Enrollments in Chemical Engineering," *Chemistry in Canada*, **27**, (12), 25-27 (1975).
- 29.\* Topaloglu, T. and D.E. Seborg, "An Algorithm for Pole Assignment Using Output Feedback," *Internat. J. Control*, **22**, 741-748 (1975).
- 30.\* Chintapalli, P.K.R., D.E. Seborg and D.G. Fisher, "Modal Identification of Linear State Space Models," Proc. 6th World Triennial Congress of the Internat. Fed. of Automatic Control, Paper II.1, Boston (August, 1975).
- 31.\* Wilson, R.G., D.E. Seborg and D.G. Fisher, "A Least Squares Approach to Model Reduction and the Design of Low-Order Controllers," *Can. J. Chem. Eng.*, **54**, 220-226 (1976).
- 32.\* Rijnsdorp, J.E. and D.E. Seborg, "A Survey of Experimental Applications of Multivariable Control to Process Control Problems," *AIChE Sympos. Series*, **72**, (159), 112-123 (1976).
- 33.\* Meyer, C., D.E. Seborg and R.K. Wood, "A Comparison of the Smith Predictor and Conventional Feedback Control," *Chem. Eng. Science*, **31**, 775-778 (1976).
- 34.\* Shah, S.L., D.E. Seborg and D.G. Fisher, "Disturbance Localization in Multivariable Control Problems," Proc. 1976 Joint Automatic Control Conf., pp. 618-626, Lafayette, Indiana (July, 1976).
35. Seborg, D.E. (editor), *Annual Directory of Chemical Engineering Research in Canadian Universities*, 15th edition, published by the *Can. Soc. Chem. Eng.*, Ottawa (1976).
- 36.\* Sastry, V.A., D.E. Seborg and R.K. Wood, "An Application of a Self-Tuning Regulator to a Binary Distillation Column," *Automatica*, **13**, 417-424 (1977).
- 37.\* Chintapalli, P.K.R., D.E. Seborg and D.G. Fisher, "Model Reference Identification of State Space Models for a Double Effect Evaporator," *Can. J. Chem. Eng.*, **55**, 213-220 (1977).
- 38.\* Shah, S.L., D.E. Seborg and D.G. Fisher, "Disturbance Localization in Linear Systems by Eigenvector Assignment," *Internat. J. of Control*, **26**, 853-869 (1977).
39. Seborg, D.E. (editor), *Annual Directory of Chemical Engineering Research in Canadian Universities*, 16th edition, published by the *Can. Soc. Chem. Eng.*, Ottawa (1977).
- 40.\* Fisher, D.G. and D.E. Seborg, "Representation of Information in a Digital Computer," *CACHE Monograph Series in Real-Time Computing, Monograph III*, pp. 5-1 to 5-35 (1977).
- 41.\* Shah, S.L., D.E. Seborg and D.G. Fisher, "Design and Application of Controllers and Observers for Disturbance Minimization and Pole Assignment," *Trans. ASME, J. Dynamic Systems, Meas. and Control*, **102**, 21-27 (1980).
- 42.\* Iwai, Z., D.E. Seborg and D.G. Fisher, "Model Reference Adaptive Control Using Output Feedback and Observers," Proc. 1977 Joint Automatic Control Conf., pp. 1618-1627, San Francisco (June, 1977).
- 43.\* Shah, S.L., D.G. Fisher and D.E. Seborg, "Eigenvalue Invariance to System Parameter Variations by Eigenvector Assignment," *Internat. J. Control*, **25**, 871-881 (1977).
- 44.\* Meyer, C., D.E. Seborg and R.K. Wood, "An Experimental Application of Time Delay Compensation Techniques to Distillation Column Control," *IEC Process Design and Develop.*, **17**, 62-67 (1978).
- 45.\* Iwai, Z., D.E. Seborg and D.G. Fisher, "Decoupling of Linear Time-Varying Systems with Time Delays in the Control Variables or State Variables," *Internat. J. Control*, **28**, 869-888 (1978).

- 46.\* Seborg, D.E. and D.G. Fisher, "Experience with Experimental Applications of Multivariable Computer Control," *Trans. ASME, J. Dynamic Systems, Meas. and Control*, **101**, 108-116 (1979).
- 47.\* Meyer, C.B.G., R.K. Wood and D.E. Seborg, "Experimental Evaluation of Analytical and Smith Predictors for Distillation Column Control," *AIChE J.*, **25**, 24-32 (1979).
- 48.\* Inoue, A., D.G. Fisher, D.E. Seborg and S.L. Shah, "An Output Feedback Approximation to Optimal State Feedback Control," Proc. 1978 Joint Automatic Control Conf., Vol. 3, 391-401, Philadelphia (October, 1978).
- 49.\* Inoue, A., D.G. Fisher, S.L. Shah and D.E. Seborg, "Minimal-Time, Minimal-Order Observers for Discrete Systems," *Internat. J. Control*, **30**, 597-615 (1979).
50. Seborg, D.E., "Evaluation of Advanced Control Techniques via Pilot Plant Studies," Proc. ISA/78 Conf., Philadelphia (October, 1978) - abstract only.
51. Seborg, D.E., "A Survey of Process Control Education in the United States and Canada," *Chem. Eng. Educ.*, **14**, No. 4, 4244 (1980).
- 52.\* Shah, S.L., D.G. Fisher, and D.E. Seborg, "Design and Experimental Evaluation of Controllers for Process Undisturbability," *AIChE J.*, **27**, 131-138 (1981).
- 53.\* Benallou, A., D.A. Mellichamp and D.E. Seborg, "Characterization of the Equilibrium Set of Bilinear Systems," *Automatica*, **19**, 183-189 (1983).
- 54.\* Gagnepain, J.P. and D.E. Seborg, "Analysis of Process Interactions with Applications to Multiloop Control System Design," *I&EC Process Design and Develop.*, **21**, 5-11 (1982).
- 55.\* Yuwana, M. and D.E. Seborg, "A New Method for On-Line Controller Tuning," *AIChE J.*, **28**, 434-440 (1982).
- 56.\* Shah, S.L., D.G. Fisher and D.E. Seborg, "Experimental Evaluation of Controllers Designed for Disturbance Localization and Asymptotic Setpoint Tracking," Proc. 8th Triennial World Congress of the Internat. Fed. Auto. Control, Kyoto (1981).
57. Seborg, D.E., "ChE at UC Santa Barbara," *Chem. Eng. Educ.*, **15**, 106-111 (1981).
- 58.\* Chang, T.S. and D.E. Seborg, "A Linear Programming Approach for Multivariable Feedback Control with Inequality Constraints," *Int. J. Control*, **37**, 583-597 (1983).
59. Seborg, D.E., Book Review of "Digital Control Systems," *Automatica*, **20**, 138-139 (1984).
- 60.\* Benallou, A., D.A. Mellichamp and D.E. Seborg, "On the Number of Solutions of Multivariable Polynomial Systems," *IEEE Trans. Autom. Control*, **AC-28**, 224 (1983).
- 61.\* Cameron, F. and D.E. Seborg, "A Self-Tuning Controller with a PID Structure," *Int. J. Control*, **38**, 401-417 (1983).
- 62.\* Marchetti, J.L., A. Benallou, D.E. Seborg and D.A. Mellichamp, "A Pilot-Scale Distillation Facility for Digital Computer Control Research," *Computers & Chemical Engineering*, **9**, 301-309 (1985).
63. Edgar, T.F. and D.E. Seborg, "Feedforward Control," Module A4.3, *AIChE Modular Instruction Series*, AIChE, NY (1984).
- 64.\* Marchetti, J.L., D.A. Mellichamp, and D.E. Seborg, "Predictive Control Based on Discrete Convolution Models," *I&EC Process Design and Develop.*, **22**, 488-495 (1983).
- 65.\* Chien, I.-L., D.A. Mellichamp, and D.E. Seborg, "Adaptive Control Strategies for Distillation Columns," *I&EC Process Design and Develop.*, **25**, 595-600 (1985).
- 66.\* Marchetti, J.L., D.A. Mellichamp, and D.E. Seborg, "Design of Predictive Control Systems Based on Pole Assignment," Proc. 1983 American Control Conf., 1132-1138, San Francisco (June, 1983).
67. Seborg, D.E., Book Review of "Advanced Process Control," *AIChE J.*, **30**, 1972 (1984).



- 68.\* Seborg, D.E., S.L. Shah, and T.F. Edgar, "Adaptive Control Strategies for Process Control: A Survey," *AIChE J.*, **32**, 881-913 (1986).
69. Edgar, T.F., and D.E. Seborg, "Adaptive Control," *AIChE Modular Instruction Series, Module A45*, AIChE, NY (1984).
- 70.\* Chien, I.-L., D.E. Seborg and D.A. Mellichamp, "A Self-Tuning Controller for Systems with Unknown or Varying Time Delays," *Int. J. Control*, **42**, 949-964 (1985).
- 71.\* Chien, I-Lung, D.A. Mellichamp, and D.E. Seborg, "Multivariable Self-Tuning Controller with Time Delay Compensation," Proc. IFAC Workshop on Adaptive Control, York, England (1985).
- 72.\* Maurath, P.R., D.A. Mellichamp and D.E. Seborg, "Predictive Controller Design for SISO Systems," *I&EC Research*, **27**, 956-963 (1988).
- 73.\* Maurath, P.R., D.E. Seborg, A.J. Laub, and D.A. Mellichamp, "Predictive Controller Design by Principal Components Analysis," *I&EC Research*, **27**, 1204-1212 (1988).
- 74.\* Phillips, S.F. and D.E. Seborg, "Adaptive Control Strategies for Process Startup," Proc. American Control Conf., 1253-59, Boston (1985).
- 75.\* Stathaki, A., D.A. Mellichamp, and D.E. Seborg, "Dynamic Simulation of a Multicomponent Distillation Column with Asymmetric Dynamics," *Can. J. Ch. Eng.*, **63**, 510-518 (1985).
- 76.\* Wong, S., and D.E. Seborg, "Optimal Proportional Plus Integral Control for Regulator and Tracking Problems," *Optimal Control Applic. & Methods*, **6**, 335-350 (1986).
- 77.\* Iwai, Z., D.G. Fisher and D.E. Seborg, "Reduced-Order, Multivariable Models with Pure Time Delays," *AIChE J.*, **31**, 229-236 (1985).
- 78.\* Agarwal, M. and D. E. Seborg, "Self-Tuning Controllers for Nonlinear Systems," *Automatica*, **23**, 209-214 (1987).
- 79.\* Chien, I-L., D.E. Seborg, and D.A. Mellichamp, "Experimental Evaluation of a Multivariable Self-Tuning Controller," Proc. IFAC Workshop on Adaptive Control of Chemical Processes, Frankfurt, West Germany (October, 1985).
- 80.\* Benallou, A., D.E. Seborg, and D.A. Mellichamp, "Dynamic Compartmental Models for Separation Processes," *AIChE J.*, **32**, 1067-1078 (1986).
- 81.\* Wong, S. and D.E. Seborg, "A Theoretical Analysis of Smith and Analytical Predictors," *AIChE J.*, **32**, 1597-1605 (1986).
- 82.\* Maurath, P. R., D. E. Seborg and D. A. Mellichamp, "Achieving Decoupling with Predictive Controllers," Proc. Amer. Control Conf., 1372, Seattle (1986).
- 83.\* Chien, I.-L., D.E. Seborg, and D.A. Mellichamp, "Self-Tuning Control with Decoupling," *AIChE J.*, **33**, 1079-1088 (1987).
- 84.\* Wong, S., and D. E. Seborg, "Low-Order Nonlinear Dynamic Models for Distillation Columns," Proc. Amer. Control Conf., 1023, Seattle (1986).
- 85.\* Wong, S., and D. E. Seborg, "Control Strategies for Nonlinear Multivariable Systems with Time Delays," Proc. Amer. Control Conf., 1192, Seattle (1986).
- 86.\* Yuan, P., and D. E. Seborg, "Predictive Control Using an Observer for Load Estimation," Proc. Amer. Control Conf., 669, Seattle (1986).
- 87.\* Morningred, J. D., D. A. Mellichamp and D. E. Seborg, "On-Line Adaptation of Predictive Controllers," Proc. Amer. Control Conf., 1731, Minneapolis (1987).
- 88.\* Phillips, S. F. and Seborg, D. E., "Conditions that Guarantee No Overshoot for Linear Systems," *Int. J. Control*, **47**, 1043-1059 (1988).
- 89.\* Saucier, M. F., H.-C. Chang, and D. E. Seborg, "Bifurcation Analysis for Multivariable Feedback Control Systems," *Chem. Eng. Commun.*, **57**, 215-232 (1987).

- 90.\* Agarwal, M. and D. E. Seborg, "A Multivariable Nonlinear Self-Tuning Controller," *AIChE J.*, **33**, 1379-1386 (1988).
- 91.\* Agarwal, M. and D. E. Seborg, "A Self-Tuning Controller for MIMO Nonlinear Systems," *Internat. J. of Adaptive Control and Signal Processing*, **1**, 129-142 (1987).
92. Seborg, D.E., "The Prospects for Advanced Process Control," (Invited Paper), 10th IFAC World Congress, Munich, FRG (July, 1987).
93. Kummel, M. and D. Seborg, (Ed.), "A Contemplative Stance for Chemical Process Control," *Automatica*, **23**, 801-802 (1987).
- 94.\* Phillips, S. F. and Seborg, D. E., "Adaptive Control Strategies for Achieving Desired Temperature Profiles During Process Startup. Part I Model Development and Theoretical Studies," *I&EC Research*, **27**, 1434-1443 (1988).
- 95.\* Phillips, S. F. and Seborg, D. E., "Adaptive Control Strategies for Achieving Desired Temperature Profiles During Process Startup. Part II Experimental Application," *I&EC Research*, **27**, 1443-1449 (1988).
- 96.\* Wong, S. and D. E. Seborg, "A Control Strategy for Single-Input, Single-Output, Nonlinear Systems with Time Delays," *Int. J. Control*, **48**, 2303-2327 (1988).
- 97.\* Crisalle, O.D., C. L. Bickerstaff, D. E. Seborg, and D.A. Mellichamp, "Improvements in Photolithography Performance by Controlled Baking," *Integrated Circuit Metrology, Inspection and Process Control II, SPIE Vol. 921*, 317-325 (1988).
- 98.\* Benallou, A., D. A. Mellichamp, and D. E. Seborg, "Optimal Stabilizing Controllers for Bilinear Systems," *Int. J. Control* **48**, 1487-1501 (1988).
- 99.\* Agarwal, M. and D. E. Seborg, "Self-Tuning Control of a Pilot-Scale Distillation Column," Proc. IFAC/IFORS Symposium on Identification and Parameter Estimation, Beijing, China (August, 1988).
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