Curriculum Vitae

Daniel Eduardo Rivera
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Education

Ph.D., Chemical Engineering, California Institute of Technology, June 1987.
Dissertation Title: Modeling Requirements for Process Control
Dissertation Advisor: Professor Manfred Morari

M.S., Chemical Engineering, University of Wisconsin-Madison, December 1984.
Thesis Title: Process Control Using Low Order Models
Thesis Advisor: Professor Manfred Morari

B.S., Chemical Engineering (High Distinction), University of Rochester, May 1982.

Academic Experience

Professor of Chemical Engineering, Arizona State University, August 2009 – present.

Affiliated Professor in Electrical Engineering, Arizona State University, May 2004 – present.

Associate Professor of Chemical Engineering, Arizona State University, August 1990 – July 2009.

Visiting Professor, Universidad Nacional de Educación a Distancia (UNED), Madrid, and University of Almería, Andalucía, Spain, September – October 2007.

Gästforskare (Guest Researcher), Division of Automatic Control, Department of Electrical Engineering, Linköping University, Sweden; August - December, 1996.

Lecturer, Dept. of Chemical Engineering, University of Houston; January - May, 1990.

Industrial Experience

Visiting Professor, Honeywell Technology Center, Phoenix, Arizona; January - August, 1997.

Associate Research Engineer, Shell Development Company; January 1987-July 1990.

Professional Intern, Management Services Division, Eastman Kodak Co.; May - July, 1982.

Principal Areas of Teaching and Research

Control systems engineering with emphasis on system identification and advanced control concepts applied to process systems, supply chain management, and behavioral health.

Honors, Distinctions and Recognitions

K25 Mentored Quantitative Research Career Development Award, National Institute on Drug Abuse, National Institutes of Health, 2007-2012.

Honorable Mention, CAST Director's Award, 2005 AIChE Annual Meeting, Cincinnati.

Keynote Speaker, Process Systems Engineering track, 2004 Canadian Society of Chemical Engineers Annual Meeting, Calgary, AB, 2004.

Plenary Speaker, CEA-IFAC (Spanish Automatic Control Council) Summer School, Alicante, Spain, 2004.

Teaching Excellence Award, ASU College of Engineering, 1997-1998.

Plenary Lecturer, II Congress of the Colombian Society for Automatic Control, Bucaramanga, Colombia, 1997.

Plenary Lecturer, 35th Annual Conference of the Society of Instrument and Control Engineers, Tottori, Japan, 1996.

Outstanding Undergraduate Educator, ASU AIChE Student Chapter, 1994-1995.

National Science Foundation Research Initiation Award, 1991-1994.

Best Presentation Award - Identification and Model (In)Validation Session, 1994 American Control Conference, Baltimore.

Best Paper in Session Award - Keeping the Best Students: Innovation in Engineering Education Session - 1993 ASEE Pacific Southwest Meeting, Flagstaff.

Keynote Speaker, 1992 Honeywell Advanced Control Symposium, Phoenix, AZ.

Best Presentation Award - Model Predictive Control Session, 1989 American Control Conference, Pittsburgh.

National Science Foundation Graduate Fellow, 1982-1985.

Member, Tau Beta Pi, (elected 1981).

Member, Phi Beta Kappa, (elected 1982)

Thomas J. Walter Prize for Excellence in Computer Applications, U. of Rochester, 1982.

Eastman Kodak Scholar - University of Rochester, 1979-1982.

Presidential Scholar - Puerto Rico, 1978.

Valedictorian, Wesleyan Academy, Guaynabo, Puerto Rico, 1978.

Publications

(student authors designated in **boldface**)

Refereed Archival Journals

1. Rivera, D.E., M. Morari, and S. Skogestad, "Internal Model Control 4. PID controller design," *Ind. Eng. Chem. Proc. Des. and Dev.*, **25**, 252, 1986. *21st most cited paper in I&EC since 1975;* (http://pubs.acs.org/page/iecred/anniversary/100/100mostcited.html).

2. Rivera, D.E. and M. Morari, "Control-relevant model reduction problems for SISO H2, H-infinity and mu controller synthesis," *Int. J. Control,* **46**, 505, 1987.

3. Holt, B.R., N.F. Jerome, D.E. Rivera, M. Morari, W.H. Ray *et al.*, "CONSYD - integrated software for computer-aided control system design and analysis," *Comp. and Chemical Engineering*, **11**, 187, 1987.

4. Laughlin, D.L., D.E. Rivera, and M. Morari, "Smith Predictor design for robust performance," *Int. J. of Control*, **46**, 477, 1987.

5. Rivera, D.E. and M. Morari, "Low-order SISO controller tuning methods for the H2, H-infinity and mu objective functions," *Automatica*, **26,** 361, 1990.

6. Rivera, D.E. and M. Morari, "Plant and controller reduction problems for closed-loop performance," *IEEE Trans. Autom. Cntrl.,* **37**, 398, 1992.

7. Rivera, D.E., J.F. Pollard, and C.E. García, "Control-relevant prefiltering: a systematic design approach and case study, " *IEEE Trans. Autom. Cntrl.,* Special Issue on System Identification for Control Design, **37**, 964, 1992.

8. Rivera, D.E. and **S.V. Gaikwad**. "Systematic Techniques for Determining Modeling Requirements for SISO and MIMO Feedback Control Problems," *Journal of Process Control* **5**, No. 4, pp.213-224, 1995.

9. **Jun, Kyoung-Shik**, D.E. Rivera, **E. Elisante**, and V.E. Sater. "A Computer-Aided Design Tool for Robustness Analysis and Control-Relevant Identification of Horizon Predictive Control with Application to a Binary Distillation Column," *Journal of Process Control,* **6**, No. 2-3, pp. 177-186, 1996.

10. Rivera, D.E. and **S. Gaikwad**, "Digital PID Controller Design Using ARX Estimation," *Computers and Chemical Engineering,* **20**, No. 11, pp. 1317-1334, 1996.

11. Rivera, D.E., **K.S. Jun**, V.E. Sater, and **M.K. Shetty**, "Teaching Process Dynamics and Control Using an Industrial-Scale Real-Time Computing Environment," *Computer Applications in Engineering Education*, Vol. 4 No. 3, pp. 191-205, 1996.

12. **Gaikwad, S.V**. and D.E. Rivera, "Multivariable Frequency-Response Curvefitting with Application to Control-Relevant Parameter Estimation Problems," *Automatica*, **33**, No. 6, pp. 1169-1174, 1997.

13. **Ling, W.M.** and D.E. Rivera, "Control-relevant Model Reduction of Volterra Series Models," *Journal of Process Control*., **8**, No. 2, pp 79-88, 1998.

14. **Ling, W.M.** and D.E. Rivera, "Nonlinear Black-Box Identification of Distillation Column Models - Design Variable Selection for Model Performance Enhancement," *Applied Mathematics and Computer Science*, Special Issue on Data Processing and Process Control, **8**, No. 4, 1998.

15. Rivera, D.E. and **K.S. Jun**, "An Integrated Identification and Control Design Methodology for Multivariable Process System Applications," *IEEE Control Systems Magazine*, Special Issue on Process Control, **20**, No. 3, pp. 25-37, June 2000.

16. **Vargas-Villamil, F.D.** and D.E. Rivera, "Multilayer Optimization and Scheduling Using Model Predictive Control: Application to Reentrant Semiconductor Manufacturing Lines," *Computers and Chemical Engineering*, **24**, No. 2, pp. 2009-2021, 2000.

17. Stenman, A., F. Gustafsson, D.E. Rivera, L. Ljung, T. McKelvey, "On Adaptive Smoothing of Empirical Transfer Function Estimates," *Control Engineering Practice*, **8**, No. 2, pp. 1309-1315, 2000.

18. **Ling, W.M.** and D.E. Rivera, "Control-Relevant Nonlinear System Identification Using Restricted Complexity Models," *Journal of Process Control*, **11**, No. 2, pp. 209-222, 2001.

19. **Vargas-Villamil, F.D.** and D.E. Rivera, "A Model Predictive Control Approach for Real-Time Optimization of Reentrant Manufacturing Lines," *Computers in Industry*, **45**, No. 1, pp. 45-57, 2001.

20. **Braun, M.W.**, D.E. Rivera, and A. Stenman. "A Model-on-Demand Identification Methodology for Nonlinear Process Systems," *International Journal of Control*, Vol. 74, Issue.18, pp.1708-1717, 2001.

21. **Braun, M.W.** , R. Ortiz-Mojica, and D.E. Rivera, "Design of Minimum Crest Factor Multisinusoidal Signals for Plant-Friendly Identification of Nonlinear Process Systems," *Control Engineering Practice*, Vol. 3, No. 3, pp. 301-313, March 2002.

22. **Braun, M.W.**, D.E. Rivera, W.M. Carlyle, and K.G. Kempf, "Application of Model Predictive Control to Robust Management of Multi-Echelon Demand Networks in Semiconductor Manufacturing," *Simulation: Transactions of the Society for Modeling and Simulation International*, Vol. 79, No. 3, pp.139-156, March 2003.

23. **Vargas-Villamil, F.D.**, D.E. Rivera, and K.G. Kempf, "A Hierarchical Approach to Production Control of Reentrant Semiconductor Manufacturing Lines," *IEEE Transactions on Control Systems Technology*, 11, No. 4, pp. 578-587, July, 2003.

24. **Braun, M.W.**, D.E. Rivera, **M.E. Flores**, W.M.Carlyle, K.G. Kempf, "A Model Predictive Control Framework for Robust Management of Multi-Product, Multi-Echelon Demand Networks," *Annual Reviews in Control*, Special Issue on Enterprise Integration and Networking, Volume 27, Issue 2, pp. 229-245, 2003.

25. Rivera, D.E., "Teaching Semiphysical Modeling to Chemical Engineering Students using a Brine-Water Mixing Tank Experiment," *Chemical Engineering Education*, Vol. 39, No. 4, pgs. 308-315, 2005.

26. **Schwartz, J.D.**, **W. Wang**, and D.E. Rivera, "Optimal tuning of process control-based decision policies for inventory management in supply chains," *Automatica*, Special Issue on Optimal Control Applications to Management Sciences, Vol. 42, pgs. 1311 – 1320, 2006. *Most downloaded paper in Automatica during July-Sep 2006, 14th during Oct. - Dec. 2006, and 5th during Jan - Mar 2007.* (http://top25.sciencedirect.com/index.php?subject_area_id=8&journal_id=00051098&cat_id=9).

27. **Wang, W**., D.E. Rivera, and K.G. Kempf, "Model Predictive Control strategies for supply chain management in semiconductor manufacturing," *International Journal of Production Economics*, Special Issue on Building Core Competence Through Operational Excellence, Vol. 107, pgs. 56-77, 2007. *11th most downloaded paper in IJPE during Jan - Mar 2007, 12th during Apr - June 2007.* (http://top25.sciencedirect.com/index.php?subject_area_id=8&journal_id=09255273&cat_id=11).

28. Rivera, D.E., **M.D. Pew**, and L.M. Collins, "Engineering approaches for the design and analysis of adaptive, time-varying interventions," *Drug and Alcohol Dependence*, Special Issue on Adaptive Treatment Strategies, Vol. 88, Supplement 2, pgs. S31-S40, May 2007.

29. Zafra-Cabeza, A., M.A. Ridao, E.F. Camacho, K.G. Kempf, and D.E. Rivera, "A stochastic predictive control approach applied to project risk managment in semiconductor manufacturing," *Control Engineering Practice*, Vol. 15, Issue 8, pgs. 969-984, 2007. *22nd most downloaded paper in CEP during April through June 2007.* (http://top25.sciencedirect.com/index.php?subject_area_id=12&journal_id=09670661&cat_id=12).

30. Mittelmann, H.D., **G. Pendse**, D.E. Rivera, and **H. Lee**, "Optimization-based design of plant-friendly multisine signals using geometric discrepancy criteria," *Computational Optimization and Applications*, Vol. 38, pgs 173-190, 2007.

31. Rivera, D.E., **H. Lee,** H.D. Mittelmann, and **M.W. Braun**, "High Purity Distillation: Using Plant-Friendly Multisine Signals for Experimental Testing of a Strongly Interactive Process," *IEEE Control Systems Magazine*, Special Issue on Applications of System Identification, Vol. 27, No. 5 pgs. 72 – 89, October 2007.

32. Rivera-Flores, D.E., "Una metodología para la identificación integrada con el diseño de controladores IMC-PID," (A methodology for integrated system identification with IMC-PID controller design), *Revista Iberoamericana de Automática e Informática Industrial* (Ibero-American Journal of Automatic Control and Industrial Computer Science), Vol. 4, No. 4, pgs. 129 – 134, October 2007.

33. **Wang, W**. and D.E. Rivera, "A Model Predictive Control algorithm for tactical decision-making in semiconductor manufacturing supply chain management," *IEEE Transactions on Control Systems Technology*, Vol. 16, No. 5, pgs. 841 - 855, September 2008.

34. **Schwartz, J.D.**, M.R. Arahal, D.E. Rivera, and K.D. Smith, "Control-relevant demand forecasting for tactical decision-making in semiconductor manufacturing supply chain management," *IEEE Transactions on Semiconductor Manufacturing*, Vol. 22, No. 1, pgs. 154 – 163, February 2009.

35. **Huang, D.**, H. Sarjoughian, **W. Wang**, **G. Godding**, D.E. Rivera, K.G. Kempf, and H.D. Mittelmann, "Simulation of semiconductor manufacturing supply-chain systems with DEVS, MPC, and KIB," *IEEE Transactions on Semiconductor Manufacturing*, Vol. 22, No. 1, pgs. 164 – 174, February 2009.

36. Rivera, D.E., **H. Lee**, H.D. Mittelmann, and **M.W. Braun**, "Constrained multisine input signals for plant-friendly identification of chemical process systems," *Journal of Process Control*, doi:10.1016/j.jprocont.2008.08.006, Vol. 19, Issue 4, pgs. 623-635, April 2009.

37. **Wang, W.**, D.E. Rivera, and H.D. Mittelmann, "Inner and outer loop optimization in semiconductor manufacturing supply chain management," *Computational Management Science*, doi:10.1007/s10287-008-0081-4, Vol. 6, pgs. 411-434, October 2009.

38. **Schwartz, J.D** and D.E. Rivera, "A process control approach to tactical inventory management in production-inventory systems," accepted for publication, *International Journal of Production Economics*.

39. **Steenis, R.** and D.E. Rivera, "Plant-friendly signal generation for system identification using a modified SPSA methodology," accepted for publication (pending approval of minor revisions), *IEEE Transactions on Control Systems Technology.*

40. Zafra-Cabeza A., D.E. Rivera, L.M. Collins, E.F. Camacho, M.A. Ridao, "A risk-based Model Predictive Control approach to adaptive interventions in behavioral health," accepted for publication (pending approval of minor revisions), *IEEE Transactions on Control Systems Technology*.

41. **Roche, K.T.**, D.E. Rivera, and J.K. Cochran, "A control engineering framework for managing whole hospital occupancy," submitted to *Mathematical and Computer Modelling*.

National Conference Proceedings (Refereed Papers)

1. Morari, M. S. Skogestad, and D.E. Rivera, "Implications of Internal Model Control for PID Controllers," *Proceedings of the 1984 American Control Conference*, San Diego, June 1984.

2. Rivera, D.E. and M. Morari, "Internal Model Control perspectives on model reduction," *Proceedings of the 1985 American Control Conference*, Boston, June 1985.

3. Lewin, D.R., R.E. Heersink, A. Skjellum, D.L. Laughlin, D.E. Rivera, and M. Morari, "ROBEX: robust control synthesis via expert system," *Proceedings of the IFAC 10th World Congress on Automatic Control*, Munich, Vol. 6, pgs. 369-374, 1987.

4. Rivera, D.E. and M. Morari, "Plant and controller reduction problems for closed-loop performance," *Proceedings of the 1988 Control and Decision Conference*, Austin, December, pgs. 1143-1148, 1988.

5. Rivera, D.E., "A structured singular value test for variable selection and pairing," *Proceedings of the 1989 American Control Conference,* Pittsburgh, pgs. 560-565, 1989.

6. Rivera, D.E., J.F. Pollard, L.E. Sterman, and C.E. Garcia, "An industrial perspective on control-relevant identification," *Proceedings of the 1990 American Control Conference*, San Diego, pgs. 2406-2411, 1990.

7. Rivera, D.E., "Control-relevant parameter estimation: a systematic procedure for prefilter design," *Proceedings of the 1991 American Control Conference*, Boston, pgs. 237-242, 1991.

8. Rivera, D.E. and **S. Gaikwad**, "Modeling for Control Design in Combined Feedback / Feedforward Control, *Proceedings of the 1992 American Control Conference*, Chicago, pgs. 1445-1446, June 1992.

9. Rivera, D.E., **K.S. Jun**, **E. Elisante**, V.E. Sater, and B.C. Horn, "Robustness and Identification Issues in Horizon Predictive Control with Application to a Binary Distillation Column," *Proceedings of the 1992 American Control Conference*, Chicago, pgs. 3031-3036, 1992.

10. Rivera, D.E. and **S. Gaikwad**, "Digital PID Controller Tuning using Prefiltered ARX Estimation," *Proceedings of the 31st IEEE Control and Decision Conference*, Tucson, Arizona, pgs. 68-69, 1992.

11. Rivera, D.E., **X. Chen**, and D.S. Bayard, "Experimental Design for Robust Process Control Using Schroeder-Phased Input Signals," *Proceedings of the 1993 American Control Conference*, San Francisco, pgs. 895-899, June 1993.

12. Rivera, D.E. and **S. Bhatnagar**, "Closed-loop identification of restricted complexity models using iterative refinement," *Proceedings of the 1993 American Control Conference*, San Francisco, pgs. 1993-1994, June 1993.

13. Rivera, D.E., **A. Desai**, T. Beaumariage and C. Roberts, "Knowledge-Based Framework for Controller Structure Selection in Intelligent Process Control," *Proceedings of the 1993 American Control Conference*, San Francisco, pgs. 1890-1894, June 1993.

14. **Gaikwad, S.V.** and D.E. Rivera, "CONTROL-ID: An Integrated Framework for System Identification and Process Control,"*1994 Joint IEEE/IFAC Symposium on Computer-Aided Control System Design.,* Tucson, pgs 539-545, March 1994.

15. **Desai, A.** and D.E. Rivera, "Controller Structure Definition via Intelligent Process Control," *1994 Joint IEEE/IFAC Symposium on Computer-Aided Control System Design,* Tucson, pgs 601-602, March, 1994.

16. Rivera, D.E. and **S.V. Gaikwad**, "Systematic Techniques for Determining Modeling Requirements for SISO and MIMO Feedback Control Problems," *1994 IFAC Symposium on Advanced Control of Chemical Processes*, Kyoto, Japan, pgs. 17-22, May, 1994.

17. **Jun, Kyoung-Shik** and D.E. Rivera, "A Computer-Aided Design Tool for Robustness Analysis and Control-Relevant Identification of Horizon Predictive Control," *Fifth International Symposium on Process Systems Engineering*, Kyongju, Korea, pgs. 1071-1076, June, 1994.

18. Rivera, D.E., **S.V. Gaikwad** and X. Chen, "CONTROL-ID: A Demonstration Prototype for Control-Relevant Identification," *1994 American Control Conference*, Baltimore, pgs. 2055-2059, June, 1994.

19. **Bhatnagar, S.** and D.E. Rivera, "Closed-Loop Identification of Restricted Complexity Models for Feedback/Feedforward Control Using Iterative Refinement," *1994 American Control Conference,* pgs. 3012-3016, June, 1994.

20. Rivera, D.E., **S.V. Gaikwad**, **X. Chen**, and **S. Bhatnagar**, "CONTROL-ID: A Demonstration Prototype for Control-Relevant Identification of Process Systems," *10th IFAC Symposium on System Identification ,* Copenhagen, Denmark, Vol. 4 pg. 5, 1994.

21. **Ling, W-M.** and D.E. Rivera, "Restricted complexity approximation of Volterra series models using a control-relevant approach," *1996 IFAC World Congress*, San Francisco, paper 7a-07-2, Volume M, pgs. 223-228.

22. **Gaikwad, S.V.** and D.E. Rivera, "Control-relevant input signal design for multivariable system identification: application to high purity distillation control," *1996 IFAC World Congress*, San Francisco, paper 7a-10-5P, Volume M, pgs. 349-354.

23. **Vargas-Villamil, F.D**. and D.E. Rivera, "Scheduling of reentrant manufacturing lines using a Model Predictive Control (MPC) approach," *1997 American Control Conference*, Albuquerque, NM, June 4-6, 1997, pgs. 1919-1923.

24. D.E. Rivera and **S. Adusumilli**, "A methodology for integrated system identification and PID controller design," *1997 IFAC Symposium on Advanced Control of Chemical Processes (ADCHEM '97)*, Banff, Canada, June 9-11, 1997, pgs. 19-24.

25. **Jun, K.S.** and D.E. Rivera, "High-order ARX estimation and its application to decentralized, decoupled, and full multivariable control," *1997 IFAC Symposium on Advanced Control of Chemical Processes (ADCHEM '97*), Banff, Canada, June 9-11, 1997, pgs. 499-504.

26. Rivera, D.E., **S. Zong** and **W.M. Ling**, "A control-relevant multivariable system identification methodology based on orthogonal multifrequency input perturbations," *1997 IFAC Symposium on System Identification (SYSID'97)*, Fukuoka, Japan, July 8-11, 1997, pgs 595-600.

27. **Ling, W.-M.** and D.E. Rivera, "Multivariable impulse response estimation via correlation analysis and its application towards automated system identification," *1997 IFAC Symposium on System Identification (SYSID'97)*, Fukuoka, Japan, July 8-11, 1997, pgs 1461-1466.

28. **Adusumilli, S.** and D.E. Rivera, "*ASUtune*: A program for integrated system identification and PID controller design," *1997 IFAC Symposium on System Identification (SYSID'97),* Fukuoka, Japan, July 8-11, 1997, pgs. 1579-1585.

29. **Adusumilli, S.**, D.E. Rivera, S. Dash, and K. Tsakalis, "Integrated MIMO Identification and Robust PID Controller Design Using Loop Shaping," *1998 American Control Conference*, Philadelphia, PA, pgs. 1230-1234.

30. Stenman, A., F. Gustafsson, D.E. Rivera, L. Ljung, T. McKelvey, "On Adaptive Smoothing of Empirical Transfer Function Estimates," *1999 IFAC World Congress*, Beijing, China, Volume H, pgs. 415-420, 1999.

31. **Vargas-Villamil, F.D.** and D.E. Rivera, "Adaptive Model Predictive Control for Production Optimization and Inventory Control of Semiconductor Reentrant Manufacturing Lines," June, 2-4, *1999 American Control Conference*, San Diego, CA, pgs. 4087-4091.

32. **Braun, M.W.**, D.E. Rivera, A. Stenman, W. Foslien, and C. Hrenya, "Multi-level Pseudo-Random Signal Design and "Model on Demand" Estimation Applied to Nonlinear Identification of a RTP Wafer Reactor," June 2-4, *1999 American Control Conference*, San Diego, CA, pgs. 1573-1577.

33. **Adusumilli, S.**, S. Dash, D.E. Rivera, and K. Tsakalis, "A Comparison of Identification-Based Performance Bounds for Robust Process Control," *1999 IEEE Conference on Control Applications*, Hawaii, August 22-27, 1999, pgs 594-599.

34. **Braun, M.W.**, D.E. Rivera, A. Stenman, and W. Foslien, "Comparison of Global Nonlinear Models and Model on Demand Estimation Applied to Identification of a RTP Wafer Reactor," *1999 Control and Decision Conference*, Phoenix, AZ, pgs. 3950-3955.

35. **Braun, M.W**, **B. McNamara**, D.E. Rivera, and A. Stenman, "Model-on-Demand Identification for Control: An Experimental Study and Feasibility Analysis for MoD-based Predictive Control," *Proceedings of the IFAC Symposium on System Identification* (SYSID 2000), Santa Barbara, CA, pages 439-440.

36. **Flores, M.E.** and D. E. Rivera, "pIDtune: A Graphical Package for Integrated System Identification and PID Controller Design*," Proceedings of the IFAC Symposium on System Identification* (SYSID 2000), Santa Barbara, CA, pages 681-686.

37. Rivera, D.E. and **M. E. Flores**, "Beyond Step Testing and Process Reaction Curves: Introducing Meaningful Identification Concepts in the Undergraduate Chemical Engineering Curriculum," *Proceedings of the IFAC Symposium on System Identification* (SYSID 2000), Santa Barbara, CA, pages 815-820.

38. **Braun, M.W.**, **R. Ortiz-Mojica**, and D.E. Rivera, "Design of Minimum Crest Factor Multisinusoidal Signals for Plant-Friendly Identification of Nonlinear Process Systems," *Proceedings of the IFAC Symposium on System Identification* (SYSID 2000), Santa Barbara, CA, 1097-1102.

39. Rivera, D.E. and **M.E. Flores**. "Using a Gas-Oil Furnace Simulation to Introduce Meaningful System Identification Concepts in an Undergraduate Control Course," *AIChE 2000 Topical Conference on Chemical Engineering Education*, Paper 61c, pgs. 321-328, November, 2000.

40. **Yang, L.** and D.E. Rivera, "Integrated Identification and Model Predictive Control Using Iterative Refinement," *Proceedings of the 2001 American Control Conference*, Arlington, VA, pgs. 1190-1195, June 25-27, 2001.

41. **Braun, M.W.**, D.E. Rivera, W. M. Carlyle, and K. G. Kempf , "A Model Predictive Control Framework for Robust Management of Multi-Product, Multi-Echelon Demand Networks," *15th IFAC World Congress*, Barcelona, Spain, Paper T-Mo-A16, pgs. 1-6 (electronic), July 21-26, 2002.

42. Rivera, D.E., **M.W. Braun**, and H.D. Mittelmann, "Constrained multisine inputs for plant-friendly identification of chemical processes," *15th IFAC World Congress*, Barcelona, Spain, Paper T-We-A11, pgs. 1-6 (electronic), July 21-26, 2002.

43. **Wang, W.**, D.E. Rivera, and K.G. Kempf, "Centralized Model Predictive Control Strategies for Inventory Management in Semiconductor Manufacturing Supply Chains," *2003 American Control Conference*, Denver, CO., pgs. 585-590, June 4-6, 2003.

44. **Lee, H.**, D.E. Rivera, and H.D. Mittelmann, "Constrained minimum crest factor multisine signals for plant-friendly identification of highly interactive systems," *13th IFAC Symposium on System Identification*, Rotterdam, The Netherlands, pgs. 947-952, August 27-29, 2003.

45. Rivera, D.E., **H. Lee**, **M.W. Braun**, and H.D. Mittelmann, "Plant-friendly system identification: a challenge for the process industries," *13th IFAC Symposium on System Identification*, Rotterdam, The Netherlands, pgs. 917-922, August 27-29, 2003.

46. Rivera, D.E. "Teaching semiphysical modeling to chemical engineering students using a brine-water mixing tank experiment," *13th IFAC Symposium on System Identification*, Rotterdam, The Netherlands, pgs. 1607-1612, August 27-29, 2003.

47. **Wang, W**., D. E. Rivera, K.G. Kempf and K. D. Smith, "A Model Predictive Control Strategy for Supply Chain Management in Semiconductor Manufacturing under Uncertainty," *2004 American Control Conference*, Boston, MA, pgs. 4577-4582, June 30-July 2, 2004.

48. **Schwartz, J.D**., D.E. Rivera, and K.G. Kempf, "Towards control-relevant forecasting in supply chain management," *2005 American Control Conference*, pgs. 202-207, Portland, Oregon, June 8-10, 2005.

49. **Wang, W**., D.E. Rivera, and K.G. Kempf, "A Novel Model Predictive Control algorithm for supply chain management in semiconductor manufacturing," pgs. 208-213, *2005 American Control Conference*, Portland, Oregon, June 8-10, 2005.

50. **Lee, H.** and D.E. Rivera, "Control-relevant curvefitting for plant-friendly multivariable system identification," *2005 American Control Conference*, pgs. 1431-1436, Portland, Oregon, June 8-10, 2005.

51. Rivera, D.E. and **M.D. Pew**, "Evaluating PID control for Supply Chain Management: A Freshman Design Project," *2005 IEEE Control and Decision Conference*, pgs. 3415-3419, Seville, Spain, Dec. 12-15, 2005.

52. Sarjoughian, H.S., **D. Huang**, G. Godding, **W. Wang**, D.E. Rivera, H.D. Mittelmann, and K.G. Kempf, "Hybrid Discrete-Event Simulation with Model Predictive Control for Semiconductor Supply Chain Manufacturing," *2005 Winter Simulation Conference*, pgs. 256-266, Orlando, FL, Dec. 4-7, 2005.

53. Barker, H.A., D.E. Rivera, A.H. Tan, and K.R. Godfrey, "Perturbation Signal Design," *14th IFAC Symposium on System Identification (SYSID 2006),* pgs. 1121 – 1126, Newcastle, Australia, March 29-31, 2006.

54. **Schwartz, J.D.** and D.E. Rivera, "Control-relevant demand modeling for supply chain management," *14th IFAC Symposium on System Identification (SYSID 2006),* pgs. 267-272, Newcastle, Australia, March 29-31, 2006.

55. Rivera, D.E., **H. Lee**, H.D. Mittelmann, and **G. Pendse**, "Optimization-based design of plant-friendly multisine signals using geometric discrepancy criteria," pgs. 1133 – 1138, *14th IFAC Symposium on System Identification (SYSID 2006),* pgs. 1133 – 1138, Newcastle, Australia, March 29-31, 2006.

56. **Lee, H.** and D.E. Rivera, "CR-IDENT: A Matlab Toolbox for Multivariable Control-Relevant System Identification," *14th IFAC Symposium on System Identification (SYSID 2006),* pgs. 708-713, Newcastle, Australia, March 29-31, 2006.

57. **Lee, H.** and D.E. Rivera, "An Integrated Input Signal Design and Control-Relevant Parameter Estimation Approach for Highly Interactive Multivariable Systems," *2006 American Control Conference*, Minneapolis, MN, pgs. 1665 – 1670, June 14-16, 2006.

58. **Schwartz, J.D.** and D.E. Rivera, "Simulation-based optimal tuning of Model Predictive Control policies for supply chain management using simultaneous perturbation stochastic approximation," *2006 American Control Conference*, pgs. 556 – 561, Minneapolis, MN, June 14-16, 2006.

59. **Schwartz, J.D.** and D.E. Rivera, "Process control education using inventory management in supply chains," *7th IFAC Symposium on Advances in Control Education (ACE 2006)*, paper ThP03.4, pgs. 1-6, Madrid, Spain, June 21 – 23, 2006.

60. **Huang, D.**, **G.S. Godding**, H.S. Sarjoughian, D.E. Rivera, and K.G. Kempf, "Flexible experimentation and analysis of hybrid DEVS and MPC models," *2006 Winter Simulation Conference*, pgs. 1863-1870, Washington, D.C., December 3 - 6, 2006.

61. Zafra-Cabeza, A., D.E. Rivera, L.M. Collins, E.F. Camacho, M.A. Ridao, "A risk-based Model Predictive Control approach to adaptive interventions in behavioral health," *45th IEEE Conference on Decision and Control*, pgs. 673-678, San Diego, CA, Dec. 13 – 15, 2006.

62. **Lee, H.,** D.E. Rivera, H.D. Mittelmann, and **G. Pendse**, "Optimization-based design of plant-friendly input signals for Model-on-Demand Estimation and Model Predictive Control," *2007 American Control Conference*, pgs. 1560-1565, New York City, NY, July 11 - 13, 2007.

63. **Schwartz, J.D.** and D.E. Rivera, "Multi-objective control-relevant demand modeling for production and inventory control," *3rd Annual IEEE Conference on Automation Science and Engineering*, pgs. 710 – 715, Scottsdale, AZ, Sept. 22 - 25, 2007.

64. **Schwartz, J.D.**, M.R. Arahal, and D.E. Rivera, "Control-relevant demand forecasting for management of a production-inventory system," *2008 American Control Conference*, pgs. 4053 – 4058, Seattle, Washington, June 11-13, 2008.

65. Guzmán, J.L., D.E. Rivera, S. Dormido, and M. Berenguel, "*ITSIE*: An Interactive Software Tool for System Identification Education," pgs. 752 - 757, *15th IFAC Symposium on System Identification (SYSID 2009)*, St. Malo, France, July 6-8, 2009.

66. **Schwartz, J.D.** and D.E. Rivera, "A System Identification Approach to PDE Modeling of a Semiconductor Manufacturing Process," pgs. 964 - 969, *15th IFAC Symposium on System Identification (SYSID 2009)*, St. Malo, France, July 6-8, 2009.

67. Guzmán, J.L., D.E. Rivera, S. Dormido, and M. Berenguel, "Teaching system identification through interactivity," *8th IFAC Symposium on Advances in Control Education (ACE 2009)*, Kumamoto, Japan, October 21-23, 2009.

68. **Steenis, R.** and D.E. Rivera, "Plant-friendly signal generation for system identification using a modified SPSA methodology," pgs. 470 – 475, *48th IEEE Conference on Decision and Control*, Shanghai, China, December 16 – 18, 2009.

69. **Schwartz, J.D.** and D.E. Rivera, "Control-relevant estimation of demand models for closed-loop control of a production-inventory system," pgs. 416-421, *48th IEEE Conference on Decision and Control*, Shanghai, China, December 16 – 18, 2009.

70. Stoica, C., M.R. Arahal, D.E. Rivera, P. Rodriguez-Ayerbe, and D. Dumur, "Application of robustified model predictive control to a production-inventory system," pgs. 3993-3998, *48th IEEE Conference on Decision and Control*, Shanghai, China, December 16 – 18, 2009 *(received the General Chairs Recognition Award for Interactive Papers, 48th IEEE-CDC/CCC).*

71. Navarro-Barrientos, J.E., D.E. Rivera, and L.M. Collins, "A dynamical systems model for understanding behavioral interventions for weight loss," published in S.-K. Chai, J.J. Salerno, and P.L. Mabry (Eds.): *2010 International Conference on Social Computing, Behavioral Modeling, and Prediction (SBP 2010)*, LNCS 6007, pp. 170-179. Springer, Heidelberg (2010). Conference held in Bethesda, MD, March 29 - April 1, 2010.

72. **Steenis, R.** and D.E. Rivera, "Probabilistic uncertainty description for an ETFE estimated plant using a sequence of multi-sinusoidal signals," accepted to the *2010 American Control Conference*, Baltimore, MD, June 30 - July 2, 2010.

73. Nandola, N. and D.E. Rivera, "A robust Model Predictive Control formulation for hybrid systems with application to adaptive behavioral interventions," accepted to the *2010 American Control Conference*, Baltimore, MD, June 30 - July 2, 2010.

National Conference Proceedings (Reviewed Papers, Abstracts, and Presentations)

1. Rivera, D.E., "Multitask capabilities for a PET microcomputer using FORTH," *Proceedings of the 1982 Rochester FORTH conference*, pgs. 103 – 111, May 1982.

2. Rivera, D.E., C. Webb, and M. Morari, "A control-relevant identification methodology," *AIChE Annual Meeting*, New York, Paper No. 82b, pgs. 1-20, November, 1987.

3. Rivera, D.E., J.F. Pollard, and C.E. García, "Control-relevant parameter estimation via prediction-error methods: implications for digital PID and QDMC control," *AIChE Annual Meeting*, Chicago, Paper 4a, pgs. 1-35, 1990.

4. Rivera, D.E., "Towards an integrated methodology for the identification and design of robust, low-order controllers," Paper 154a, *AIChE Annual Meeting*, Los Angeles, pgs. 1-25, 1991.

5. Rivera, D.E. and **A. Tedja**, "A control-relevant methodology for closed-loop identification," Paper 144b, *AIChE Annual Meeting*, Los Angeles, pgs. 1-26, 1991.

6. Rivera, D.E. "Monitoring Tools for PRBS Testing in System Identification," Paper 131d, *AIChE Annual Meeting*, Miami Beach, pgs. 1-18, 1992.

7. **Hamu, D**. C. Roberts, T. Beaumariage, **A. Desai** and D.E. Rivera, "A Knowledge-base Framework for Intelligent Process Control," *1993 Society for Computer Simulation Western Multiconference*, San Diego, pgs. 74-77, January 1993.

8. Rivera, D.E., V.E. Sater, and **M.K. Shetty**, "A Novel Laboratory for Process Control Education," *Proceedings of the 1993 ASEE Pacific Southwest Section Annual Meeting and Conference*, pgs. 247-264, October 1993.

9. **Gaikwad, S.V.** and D.E. Rivera, "Integrated Identification and Control for Model Predictive Controllers," paper 227a, *1994 AIChE Annual Meeting*, San Francisco, November 15, 1994, pgs. 1-23.

10. **Jun, K.S.** and D.E. Rivera, "A Control-Relevant Identification Methodology for Inferential Control Systems Using Partial Least Squares Estimation," Paper 226g, 1994 AIChE Annual Meeting, San Francisco, November 13-18, 1994, pgs. 1-14.

11. **Gaikwad, S.V.** and D.E. Rivera, "Control-relevant identification of ill-conditioned systems: two high-purity distillation case studies," Paper 183i, *1995 AIChE Annual Meeting*, Miami Beach, November 15, 1995, pgs. 1-7.

12. **Ling, W-M.** and D.E. Rivera, "Control-relevant model reduction of Volterra series models," Paper 183c, *1995 AIChE Annual Meeting*, Miami Beach, November 15, 1995, pgs. 1-17.

13. Rivera, D.E. "Control-Relevant Identification of Multivariable, Highly Interactive Systems," 1997 Honeywell World-Wide Controls Workshop, Phoenix, AZ January 15, 1997, pgs. 398-442.

14. Rivera, D.E., **S. Adusumilli**, **S. Zong**, **S.V. Gaikwad**, and **X. Chen**, "CONTROL-ID and ASUtune: Two Demonstration Prototypes for Integrated System Identification and Process Control," 1997 Honeywell World-Wide Controls Workshop, Phoenix, AZ January 15, 1997, pgs. 446-466.

15. Rivera, D.E. "Retos en la identificación de procesos con modelos multivariables, con aplicación a una columna de destilacion de alta pureza," (Challenges in system identification for the process industries, with application to high purity distillation), invited plenary paper, II Congress of the Colombian Society for Automatic Control, Bucaramanga, Colombia, March 20, 1997, pgs. 1-17.

16. **Jun, K.S.**, D.E. Rivera, K.S. Tsakalis, H.M. Liaw, E. Hall, and C. Stein, "PID Optimization for Temperature Control of Epitaxial Growth," 191st Electrochemical Society Meeting, Montreal, Quebec, May 6-8, 1997. Abstract: 296, pgs. 373-374;

17. **Adusumilli, S.** and D.E. Rivera, "Integrated system identification and PID control design using Laguerre basis functions," paper 214b, pgs. 1-33, 1997 AIChE Annual Meeting, Los Angeles.

18. **Vargas-Villamil, F.D.** and D.E. Rivera, "Long-term scheduling of semiconductor fabrication plants using Model Predictive Control, paper 211f, pgs. 1-27, 1997 AIChE Annual Meeting, Los Angeles.

19. Rivera, D.E., **S. Zong**, and **W.M. Ling**, "A multivariable system identification methodology based on "zippered" Schroeder-phased inputs," paper 195a, pgs. 1-10, 1997 AIChE Annual Meeting, Los Angeles.

20. Rivera, D.E., **S. Adusumilli**, A. Stenman, F. Gustavsson, T. McKelvey, L. Ljung, "Just-in-time models for improved identification and control," paper 193f, pgs. 1-8, 1997 AIChE Annual Meeting, Los Angeles.

21. **Jun, K.S.** and D.E. Rivera, "Systematic Identification, Control Structure Selection, and Controller Tuning for Temperature Control of Epitaxial Growth," 1998 SEMATECH Advanced Equipment Control/Advanced Process Control Symposium X, Vail, Colorado, pgs. 673-686.

22. **Vargas-Villamil, F.D.** and D.E. Rivera, "Multi-Layer Optimization and Scheduling of Re-entrant Semiconductor Manufacturing Lines," 1998 SEMATECH Advanced Equipment Control/Advanced Process Control Symposium X, Vail, Colorado, pgs. 687-705.

23. Rivera, D.E., "Metodología para la Identificacion Integrada de Sistemas y Diseño de Controladores PID," III Simposio Internacional de Automatización, TECSUP, Lima, Peru, October 21, 1999. Pgs. 1-15.

24. Rivera, D.E. and **M. E. Flores**, "Plant-friendly Closed-Loop Identification Using Model Predictive Control," Process Modeling, Identification and Estimation Session, 1999 AIChE National Meeting, Dallas, paper 227d, pgs. 1-8.

25. **Vargas-Villamil, F.D.** and D.E. Rivera, "A Model Predictive Control Approach for Real-Time Optimization of Reentrant Manufacturing Lines*," Proceedings of the International Conference on Modeling and Analysis of Semiconductor Manufacturing* (MASM 2000), pgs. 177-182, May 2000.

26. **Braun, M.W., R. Ortiz-Mojica**, and D.E. Rivera, "Design of Minimum Crest Factor Multisinusoidal Signals for Model-On-Demand System Identification and Model Predictive Control," AIChE 2000 Annual Meeting, Paper 252c, pgs. 1 - 37, November, 2000.

27. **Braun, M.W.**, D.E. Rivera, and A. Stenman, "Model-On-Demand Model Predictive Control for Nonlinear Process Systems," AIChE 2000 Annual Meeting, Paper 256h, pgs. 1 - 40, November, 2000.

28. **Flores, M.E.**, D.E. Rivera, and V. Smith-Daniels, "Managing Supply Chains Using Model Predictive Control," AIChE 2000 Annual Meeting, Paper 262f, pgs. 1-10, November, 2000.

29. **Braun, M.W.**, D.E. Rivera, W. M. Carlyle, and K. G. Kempf , "Robust management of multi-product, multi-echelon demand networks using Model Predictive Control," Paper 285e, 2001 AIChE Annual Meeting, Reno, NV, Nov. 4-9, 2001, pp. 1-55.

30. Rivera, D.E., **M.W. Braun**, and H.D. Mittelmann, "Design of plant-friendly signals for fast identification using constrained minimum crest factor inputs," Paper 279h, 2001 AIChE Annual Meeting, Reno, NV, Nov. 4-9, 2001, pp. 1-6.

31. **Braun, M.W.**, D.E. Rivera, W. M. Carlyle, and K. G. Kempf , "A Model Predictive Control Framework for Robust Management of Multi-Product, Multi-Echelon Demand Networks," 2002 NSF Design, Service and Manufacturing Grantees and Research Conference, San Juan, Puerto Rico, pgs. 1-15, January 7-10, 2002

32. **Braun, M.W.**, D.E. Rivera, W. M. Carlyle, and K. G. Kempf , "Application of Model Predictive Control to Robust Management Of Multi-Product, Multi-Echelon Demand Networks in Semiconductor Manufacturing," International Conference on Modeling and Analysis of Semiconductor Manufacturing (MASM 2002), April 10-12, 2002, pgs. 387-392.

33. Rivera, D.E., **H. Lee**, **M.W. Braun**, and H.D. Mittelmann, "Identification of multivariable process systems using constrained minimum crest factor multisine inputs," paper 255f, 2002 AIChE Annual Meeting, Indianapolis, IN, Nov. 3-8, 2002.

34. Rivera, D.E., **W. Wang**, **M.W. Braun**, and K.G. Kempf, "Control-oriented approaches to inventory management in semiconductor manufacturing supply chains," paper 268c, 2002 AIChE Annual Meeting, Indianapolis, IN, Nov. 3-8, 2002.

35. **Wang, W.**, J. Ryu, D.E. Rivera, K.G. Kempf, " An Integrated Optimization and Control Approach for Managing Semiconductor Manufacturing Supply Chains under Uncertainty." Paper 446d: pgs 1-34, 2003 AIChE Annual Meeting, San Francisco, Nov. 16-21, 2003.

36. **Lee, H.**, D.E. Rivera, and H.D. Mittelmann, "A Novel Approach to Plant-Friendly Identification of Highly Interactive Systems," Paper 436a: pgs 1-15, 2003 AIChE Annual Meeting, San Francisco, Nov. 16-21, 2003.

37. **Wang, W.**, D.E. Rivera, and K.G. Kempf, "A Novel Model Predictive Control Strategy for Tactical Decision-Making in Semiconductor Manufacturing Supply Chain Management," paper 421e, pgs. 1-25, 2004 AIChE Annual Meeting, Austin, TX, November 7-12, 2004.

38. **Lee, H.** and D.E. Rivera, "A Control-Relevant, Plant-Friendly System Identification Methodology Using Shifted and "Zippered" Input Signals," paper 414r: pgs. 1-28, 2004 AIChE Annual Meeting, Austin, TX, November 7-12, 2004.

39. Rivera, D.E., H.D. Mittelmann, H.S. Sarjoughian, and K.G. Kempf, "A Novel Model Predictive Control Algorithm for Supply Chain Management in Semiconductor Manufacturing," pgs. 1-7, 2005 NSF DMII Grantees' Conference, Scottsdale, Arizona, January 3-6, 2005.

40. Rivera, D.E., **M.D. Pew**, L.M. Collins, and S.A. Murphy, "Engineering approaches for the design and analysis of adaptive, time-varying interventions," 2nd Annual Meeting of the Network on Methodological Challenges in Developing Adaptive Treatment Strategies, University of Michigan, Ann Arbor, MI, September 14-15, 2005.

41. Rivera, D.E., **W. Wang**, and **J.D. Schwartz**, and Karl G. Kempf, "A Model Predictive Control Approach for Tactical Decision-Making in Semiconductor Manufacturing Supply Chain Management," SIAM Conference on Mathematics and Industry, Detroit, MI, October 24-26, 2005.

42. **Schwartz, J.D.**, D.E. Rivera, and K.G. Kempf, "Optimal operation of semiconductor manufacturing supply chains under uncertainty using simulation-based optimization," 2005 AIChE Annual Meeting, Cincinnati, OH, October 30 - November 4, 2005.

43. **Lee, H.** and D.E. Rivera, "An integrated methodology for plant-friendly input signal design and control-relevant estimation of highly interactive processes," 2005 AIChE Annual Meeting, Cincinnati, OH, October 30 - November 4, 2005.

44. **D.E. Rivera**, H. Lee, H. D. Mittelmann, and **G. Pendse**, "Optimization-based design of plant-friendly input signals for data-centric estimation and control," 2005 AIChE Annual Meeting, Cincinnati, OH, October 30 - November 4, 2005.

45. Rivera, D.E., "Engineering control approaches for the design and analysis of adaptive interventions," 14th Annual Meeting of the Society for Prevention Research," symposium on New Approaches for Adaptive Intervention Science based on Engineering Methods, San Antonio, TX, June 2, 2006.

46. Rivera, D.E., H.D. Mittelmann, H.S. Sarjoughian, and K.G. Kempf, "Combined control-oriented and discrete-event simulation approaches for supply chain semiconductor manufacturing," 2006 NSF DMII Grantees' Conference, St. Louis, MO, July 24-27, 2006.

47. **Schwartz, J.D.** and D.E. Rivera, "Control-relevant demand modeling for supply chain management," presented at the symposium "Supply Chain Optimization," 2006 AIChE Annual Meeting, paper 465e, Session: Supply Chain Optimization, pgs. 1-17, San Francisco, November 12 – 17, 2006.

48. BeLue, Rhonda, D. E. Rivera, and J. Dziak, "Using dynamical systems methodology to inform and improve community-based participatory research for health disparities: a tutorial," 15th Annual Meeting of the Society for Prevention Research," Washington, D.C., May 31, 2007.

49. **Schwartz, J.D.** and D.E. Rivera, "GOALI: Process control approaches to supply chain management in semiconductor manufacturing," NSF International Research and Education in Engineering (IREE) Grantees' Workshop, West Lafayette, IN, Oct. 30 - Nov. 1, 2007.

50. Rivera, D.E., H. Sarjoughian, H.D. Mittelmann, and K.D. Smith, "Multi-objective control-relevant demand modeling for production and inventory control," 2008 NSF CMMI Engineering Research and Innovation Conference, Knoxville, TN, January 7-10, 2008.

51. Zafra-Cabeza, A., D.E. Rivera, L.M. Collins, M.A. Ridao, and E.F. Camacho, "A risk-based model predictive control approach to adaptive interventions for the prevention and treatment of drug abuse," 16th Annual Meeting of the Society for Prevention Research, San Francisco, CA, May 27 – 30, 2008.

52. Rivera, D.E., "Engineering Control Approaches for the Design and Analysis of Adaptive Behavioral Interventions," Mentored K Awardees Meeting, National Institute on Drug Abuse, Bethesda, MD, July 24 – 25, 2008.

53. Rivera, D.E. and L.M. Collins, "A control engineering approach for the design and analysis of adaptive behavioral interventions," 2008 INFORMS Annual Meeting, Washington, D.C., October 12 – 15, 2008.

54. Rivera, D.E. and L.M. Collins, "Engineering control approaches for the design and analysis of adaptive behavioral interventions," 2008 AIChE Annual Meeting, Philadelphia, PA, paper 487d, Session: Modeling and Control of Diseases, November 16 - 21, 2008.

55. Navarro-Barrientos, J.E., Y. Min, D.E. Rivera, D. Downs, L. Birch, and L.M. Collins, "A dynamical systems model of an intervention to prevent excessive gestational weight gain," 17th Annual Meeting of the Society for Prevention Research, Washington, D.C., May 27 – 29, 2009.

56. Walls, T.A. and D.E. Rivera, "Control engineering-based approaches to modeling substance abuse data," 17th Annual Meeting of the Society for Prevention Research, Washington, D.C., May 27 – 29, 2009.

57. Rivera, D.E. and L.M. Collins, "Engineering control approaches for optimizing behavioral interventions," 2009 American Control Conference, St. Louis, Special Session on Control Engineering and Related Systems Approaches for Improving Behavioral Health, June 10- 12, 2009.

58. Navarro-Barrientos, J.E., D.E. Rivera, L.M. Collins, D. Downs, L. Birch, and D. Thomas, "A dynamical systems model of an intervention to prevent excessive gestational weight gain," Facilitating Interdisciplinary Research: Methodological and Technological Innovation in the Behavioral and Social Sciences, Bethesda, MD, October 8, 2009.

59. Rivera, D.E., "Engineering control approaches for the design and analysis of adaptive behavioral interventions," 9th Annual Conference of the National Hispanic Science Network on Drug Abuse: Advances in Etiologic and Intervention Models in Hispanic Addiction Research, Coconut Grove, FL, October 29 – 31, 2009.

60. Stoica, C., M.R. Arahal, D.E. Rivera, P. Rodriguez-Ayerbe, and D. Dumur. "Application of Robustified Model Predictive Control to a Production-Inventory System," Retreat Day of the ART Centre of Excellence for Complex Dynamic Systems and Control, Newcastle, Australia, November 20, 2009.

Chapters in Books Authored

1. Cuthrell, J.E., D.E. Rivera, W.J. Schmidt and J.A. Vegeais, "Solution to the Shell Standard Control Problem," in **The Second Shell Process Control Workshop: solutions to the Shell Standard Control Problem**, D.M. Prett, C.E. Garcia, and B.L. Ramaker (eds.) Butterworths, Stoneham, MA 1990.

2. McFarlane, R.L. and D.E. Rivera, "System Identification for Distillation Control," chapter in **Practical Distillation Control**, W.L. Luyben (ed.), Van Nostrand Reinhold, pgs. 96-139, 1992.

3. Rivera, D.E., "Modeling Uncertainty in Control Systems: A Process Control Perspective," **The Modeling of Uncertainty in Control Systems**, R. Smith, and M. Dahleh (eds.), Springer-Verlag, London, pgs. 69-75, 1994.

4. Rivera, D.E. and **M.E. Flores** (2004). Internal Model Control, in *6.43. Control Systems, Robotics and Automation*, edited by Heinz Unbehauen, in *Encyclopedia of Life Support Systems (EOLSS)*, Developed under the auspices of the UNESCO, Eolss Publishers, Oxford, UK, http://www.eolss.net.

Other Publications

1. Rivera, D.E. Book review of **Integrated Process Control and Automation**, by J.E. Rijnsdorp, *Chem. Eng. Sci.*, **48**, 3878, November 1993.

2. **Vargas-Villamil, F.D.** and D.E. Rivera, "Control-theoretic Approaches to Scheduling of Semiconductor Manufacturing Processes: Outer Level Control using a Model Predictive Control Strategy" report to the Intel Research Council, August, 1996.

3. **Jun, K.S.** and D.E. Rivera, "Improved Temperature Control of a SiGe Epitaxy Reactor Via the Computer-Aided Design Tool EPICON", report to Motorola Semiconductor Products Sector, August, 1996.

4. Kempf, K.G., K.D. Smith, B. Toperzer, **M.W. Braun**, D.E. Rivera, and **W. Wang** "Managing Supply Chains with Model Predictive Control," U.S. Patent No. 7,054,706; filed June 30, 2003, awarded May 30, 2006.

5. Rivera, D.E., **M.D. Pew**, L.M. Collins, and S.A. Murphy, "Engineering approaches for the design and analysis of adaptive, time-varying interventions," Technical Report 05-73, The Methodology Center, Pennsylvania State University; also available from: http://www.fulton.asu.edu/~csel/Publications/AdaptivePrevention/PSUtechreportmay2005.pdf

6. Rivera, D.E., Book Review of **PID Control: New Identification and Control Design Methods**, by M.A. Johnson and M.H. Moradi, *IEEE Control Systems Magazine*, Vol. 26, No. 1, pgs. 95-97, 2006.

7. Fassois, S.D. and D.E. Rivera, "Applications of System Identification," introduction to the Special Issue, *IEEE Control Systems Magazine*, Vol. 27, No. 5, pgs. 24-26, 2007.

Invited Presentations

1. "Control-relevant parameter estimation: implications for the identification and control of process systems," Department of Chemical, Bio and Materials Engineering, Arizona State University, June 19, 1990.

2. "Insights into the control of semiconductor manufacturing," Technology '90 Conference, Mesa, Arizona, December 5, 1990.

3. "New directions in identification research: control-relevant identification," Honeywell Advanced Control Workshop, Phoenix, Arizona, January 21, 1991.

4. "Control systems engineering: enabling profitable, safe, and environmentally sound operation of process plants," New Generation Hispanic Researchers and their Research Programs: The ASU Agenda in Business, Sciences, and Social Science Symposium, Culture and Diversity: Teaching, Learning and the Curriculum of the 21st Century University, ASU West, April 8, 1991.

5. "New directions in control systems engineering for the process industries: ASU's response to the challenge," Keynote Speaker, Honeywell Advanced Control Symposium Phoenix, Arizona, January 23, 1992.

6. "New directions in identification research: control-relevant identification," Du Pont Process Control Seminar Series, Newark, Delaware, April 23, 1992.

7. "Modeling uncertainty in control systems: a process control perspective" NSF/AFOSR Workshop on the Modeling of Uncertainty in Control Systems, Santa Barbara, CA, June 20, 1992.

8. "New directions in identification research: control-relevant identification," presentation at M.W. Kellogg, Houston, Texas, August 13, 1992.

9. "Recent identification research (and other matters) at Arizona State University," presentation at Shell Development Co., Houston, Texas, August 14, 1992.

10. "Intelligent Process Control Research at ASU," Honeywell Advanced Control Symposium Phoenix, Arizona, January 27, 1993.

11. "System Identification Via Intelligent Process Control," Honeywell Advanced Control Symposium, Phoenix, AZ, April 5, 1994.

12. "CONTROL-ID: A Demonstration Prototype for Control-Relevant Identification," presentation at Westhollow Research Center, Shell Development Company, May 16, 1994.

13. "Modeling for Process Control via Control-Relevant System Identification," presentation at Honeywell Technology Center, Minneapolis, May 17, 1994.

14. "Process Control Applications of MACSYN Technologies," Automation and Control Technology Seminar at Jet Propulsion Laboratories, Pasadena, CA, August 19, 1994.

15. "PID Tuning from Plant Data Using Control-Relevant Models," Advanced Control Symposium, 22nd Honeywell Users Group Meeting, Tempe, AZ, June 14, 1995.

16. "PID Tuning from Plant Data Using Control-Relevant Models," tutorial presentation, SEMATECH AEC/APC Workshop, New Orleans, LA, November 5, 1995.

17. "A control-relevant methodology for multivariate system identification," seminar at the Dept. of Chemical Engineering, University of Alberta, Edmonton, Canada, January 29, 1996.

18. "Scheduling a reentrant manufacturing line using Model Predictive Control (MPC)," 2nd Workshop on Semiconductor Manufacturing Control and Optimization, Arizona State University, February 14, 1996.

19. "System identification for process control: challenges, opportunities, and new directions," plenary international tutorial lecture, Society of Instrument and Control Engineers of Japan, 35th Annual Conference, Tottori, Japan, July 26, 1996.

20. "System identification for process control: challenges, opportunities, and new directions," Division of Automatic Control Lecture Series, Department of Electrical Engineering, Linköping University, Sweden, September 5, 1996.

21. "Challenges, opportunities, and new directions in system identification for process control: integrated system identification and PID controller design," Department of Signals, Sensors, and Systems, Royal Institute of Technology (KTH), Stockholm, Sweden, October 16, 1996.

22. "A control-relevant identification methodology for multivariable system identification with application to high-purity distillation," Department of Signals, Sensors, and Systems, Royal Institute of Technology (KTH), Stockholm, Sweden, October 17, 1996.

23. "A control-relevant identification methodology for multivariable system identification with application to high-purity distillation," PROcess Systems Engineering Trondeim (PROST) Seminar Series, Norwegian University of Science and Technology (NTNU), Trondheim, Norway, November 8, 1996.

24. "The Value of Lennart Ljung's Work from an International Perspective," Chester Carlson Award Ceremony, Royal Swedish Academy of Engineering Sciences, Stockholm, Sweden, November 19, 1996.

25. "System identification for process control: challenges, opportunities, and new directions," Division of Automatic Control, Lund Institute of Technology, Lund, Sweden, November 25, 1996.

26. "A control-relevant methodology for multivariable system identification with application to high-purity distillation," Department of Chemical Engineering, Danish Technical University, Lyngby, Denmark, November 28, 1996.

27. "A control-relevant methodology for multivariable system identification with appliction to demanding process control problems," Department of Mechanical Engineering, Delft University of Technology, Delft, The Netherlands, November 29, 1996.

28. "Retos en la identificación de procesos con modelos multivariables, con aplicación a una columna de destilacion de alta pureza," (Challenges in system identification for the process industries, with application to high purity distillation), invited plenary talk, II Congress of the Colombian Society for Automatic Control, Bucaramanga, Colombia, March 20, 1997.

29. Panel member, "Process Control Education for the Next Century" 1997 IFAC Symposium on Advanced Control of Chemical Processes (ADCHEM '97), Banff, Canada, June 9-11, 1997.

30. "A Tool for Robust Multivariable PID Controller Design," presentation to Honeywell IAC and Hi-Spec Solutions, Phoenix, Arizona, November 7, 1997.

31. "System Identification for Process Control: Challenges, Opportunities, and New Directions," presentation to the Department of Chemical Engineering, University of Utah, April 21, 1998.

32. "System Identification for Process Control: Challenges, Opportunities, and New Directions," presentation to Process Systems Engineering Research Group, Kyoto University, Japan, July 27, 1998.

33. "Control Methods for Process Applications," Faculty of Technology and Metallurgy, University "St. Cyril and Methodius", Skopje, Macedonia, May 20-22, 1998.

34. "Control Methods for Process Applications: Multivariable Control Issues," U.S. Water Conservation Laboratory, Phoenix, AZ, March 29, 1999.

35. "Metodología para la Identificacion Integrada de Sistemas y Diseño de Controladores PID," III Simposio Internacional de Automatización, TECSUP, Lima, Peru, October 21, 1999.

36. "Comparison of Global Nonlinear Modeling and Model-on-Demand Estimation and Control to Process Systems," ASU Symposium on Advanced Modeling, Scheduling, and Control Solutions, December 3, 1999

37. "Comments on Model Requirements for Next Generation Integrated MPC and Dynamic Optimization," discussant role in the Modeling and Identification session, Chemical Process Control - 6, Tucson, Arizona, January 8, 2001.

38. "Academic versus Corporate Research Environments", Panel Member, Minority CHE Faculty 2001+: A Workshop to Develop Minority Leaders in the ChE Academy, National Science Foundation, March 4-6, 2001, Arlington, VA.

39. "What it is like to be a Chemical Engineer", presentation to 1st Grade Class at Mesa Lincoln Elementary School, May 29, 2001 (similar presentations made in May, 2002 and 2003).

40. "Inventory Management in Supply Chains: Insights Gained from a Process Control Perspective," seminar to the Department of Chemical Engineering, Purdue University, October 11, 2001.

41. "PID Controller Tuning Via Internal Model Control: A Modern Approach," tutorial presentation, 2002 Quality and Productivity Research Conference, Tempe, AZ, June 7, 2002.

42. "Model on Demand Estimation for Improved Identification and Control of Process Systems," IMA "Hot Topics" Workshop on Data-Driven Control and Optimization, University of Minnesota, Minneapolis, MN, December 6, 2002.

43. "Identification of Chemical Process Systems using Constrained Minimum Crest Factor Multisine Inputs," 17th International Forum on Process Analytical Chemistry (IFPAC), Scottsdale, AZ, January 22, 2003.

44. "Engineering Process Control: Can it Impact the Management of Chronic, Relapsing Disorders?" seminar to The Methodology Center, Penn State University, March 19, 2003.

45. "Inventory Management in Semiconductor Manufacturing Demand Networks: Insights Gained from a Process Control Perspective," Global Manufacturing and Supply Network "Knowledge Connection" Speaker Series, Intel Research Council, June 17, 2003.

46. "Model-on-Demand Estimation for Improved Identification and Control of Process Systems," Workshop on Models for Intensive Longitudinal Data and Functional Data, McGill University, October 11 and 12, 2003.

47. "How to Make a College Professor Happy," presentation to the Los Padres Foundation 2004-2005 College Orientation Program (a minority scholarship program), City College, NY, April 5, 2004.

48. "Engineering Process Control Perspectives on Adaptive, Time-Varying Interventions," Brown Bag seminar to the Methodology Center, Penn State University, April 7, 2004.

49. "Identificación de Sistemas para Aplicaciones en el Control de Procesos," (System Identification for Process Applications), international plenary speaker, five lectures presented at the CEA-IFAC (Spanish Automatic Control Council) Summer School, Playa de Calpe, Alicante, Spain, May 31 – June 4, 2004; http://www.isa.upv.es/cursosceaifac04/

50. "'Plant-Friendly' System Identification: A Challenge for the Process Industries," keynote presentation, Process Systems Engineering track, 2004 Canadian Society of Chemical Engineers Annual Meeting, Calgary, AB, October 5, 2004.

51. "Inventory management in supply chains: insights gained from a process control perspective," UCLA Systems, Dynamics, and Control seminar series, December 2, 2005.

52. "Inventory management in supply chains (and beyond): insights gained from a process control perspective," Department of Chemical Engineering, Northeastern University, February 24, 2006.

53. "Inventory management in supply chains: insights gained from a process control perspective," McMaster University, Department of Chemical Engineering, March 6, 2006.

54. "Plant-Friendly System Identification: A Challenge for the Process Industries," Fields Institute Seminar Series on Industrial Optimization, University of Toronto, March 7, 2006.

55. "What it is like to be a Puerto Rican and a Chemical Engineer," presentation to 2nd Grade Class at Lincoln Elementary School, Mesa, Arizona, May 19, 2006.

56. "Engineering control approaches for the design and analysis of adaptive interventions," Efficiency and innovation in research design, 2006 spring retreat, The Methodology Center, Pennsylvania State University, June 5, 2006.

57. "Manejo de Inventarios en Cadenas de Suministro: Perspectivas Basadas en el Control de Procesos," (Inventory management in supply chains: insights gained from a process control perspective), presentation to the Automatic Control, Electronics, and Robotics research group, University of Almería, Spain, June 27, 2006.

58. "Some perspectives on the GOALI program," GOALI symposium, 2006 NSF Design, Service, and Manufacturing Grantees and Research Conference, St. Louis, MO, July 25, 2006.

59. "Chemical Engineering Research Activities at Arizona State University," presentation to the College of Engineering, Universidad Nacional Autónoma Mexicana (UNAM), Mexico City, Mexico, Nov. 30, 2006.

60. "Manejo de Inventarios en Cadenas de Suministro: Perspectivas Basadas en el Control de Procesos," (Inventory management in supply chains: insights gained from a process control perspective), presentation to the Department of Systems and Automatic Control, University of Seville, March 14, 2007.

61. "Introduction to Mechanistic Models and Control Theory," tutorial presentation for the Statistical and Applied Mathematical Sciences Institute (SAMSI) 2007 program on Challenges in Dynamic Treatment Regimes and Multi-Stage Decision Making, NC State, Research Triangle Park, NC, June 20, 2007.

62. "Perspectivas Sobre la Gestión de Cadenas de Suministro Basadas en el Control de Procesos," (Perspectives on supply chain management using process control), presentation to students in the Advanced Process Control course at the University of Almería, Spain, October 11, 2007.

63. "Manejo de Inventarios en Cadenas de Suministro: Perspectivas Basadas en el Control de Procesos," (Inventory management in supply chains: insights gained from a process control perspective), presentation to the Automatic Control group at the University of Salamanca, Spain, October 15, 2007.

64. "Manejo de Inventarios en Cadenas de Suministro: Perspectivas Basadas en el Control de Procesos," (Inventory management in supply chains: insights gained from a process control perspective), presentation to the Department of Systems Engineering and Automatic Control, University of Valladolid, Spain, October 17, 2007.

65. "Identificación amigable al proceso: un reto para la industria química," (Plant-friendly system identification: a challenge for the chemical process industries," presentation to the Department of Systems Engineering and Automatic Control, University of Valladolid, Spain, October 18, 2007.

66. "Hacia una sociedad automatizada. A donde vamos?" (Towards an automated society: where are we headed?), radio show broadcast October 24, 2007 through the Spanish National Public Radio Network, http://teleuned.uned.es/realaudiocemav/2007_2008/2007_10/20071024_02.wma.

67. "Inventory management in supply chains (and beyond): insights gained from a process control perspective," Control Systems and Dynamics seminar series, Department of Mechanical and Aerospace Engineering, University of California-San Diego, February 1, 2008.

68. "Engineering control approaches for the design and analysis of adaptive behavioral interventions," Seminar in Industrial and Operations Engineering, University of Michigan, February 13, 2008.

69. "Engineering control approaches for the design and analysis of adaptive behavioral interventions," seminar presentation to the Prevention Science Methodology Group (PSMG), http://psmg.usf.edu, University of South Florida, February 26, 2008.

70. "Inventory management in supply chains and adaptive interventions in behavioral health: insights gained from a process control perspective," presentation to the Department of Chemical Engineering, Penn State University, March 18, 2008.

71. "A brief introduction to system identification," presentation to the Brown Bag Seminar Series, The Methodology Center, Penn State University, March 20, 2008.

72. "Engineering control approaches for the design and analysis of adaptive behavioral interventions," presentation to the Mathematics and Cognition seminar series, Arizona State University, April 8, 2008.

73. "Engineering control approaches for the design and analysis of adaptive behavioral interventions," invited presentation for the Atlantic Coast Symposium on the Mathematical Sciences in Biology and Biomedicine, http://www.ncsu.edu/cqsb/program.html, North Carolina State University, April 24, 2008.

74. "What it is like to be a Puerto Rican and a Chemical Engineer," presentation to kindergarten class at Edison Elementary School, Mesa, Arizona, May 19, 2008.

75. "Enfoques de la ingeniería de control para el análisis y diseño de intervenciones adaptativas para mejorar la salud del comportamiento," (Engineering control approaches for the design and analysis of adaptive behavioral interventions), seminar to the Department of Computing and Computer Languages, University of Almería, Spain, September 11, 2008.

76. "A Brief Introduction to Dynamical Models, System Identification, and Control Systems Engineering," R21 Roadmap Initiative Panel Meeting, Department of Human Development and Family Studies, Penn State University, September 16, 2008.

77. "Control engineering and dynamical systems approaches to improving behavioral interventions," 2008 fall retreat, The Methodology Center, Pennsylvania State University, September 18, 2008.

78. "A Brief Introduction to Dynamical Models, System Identification, and Control Systems Engineering," R21 Roadmap Initiative Panel Meeting, Center for the Continuum of Care, Treatment Research Institute, University of Pennsylvania, November 20, 2008.

79. "A dynamical systems and control engineering perspective for optimizing behavioral interventions," presentation to the PSY 598 Prevention Science seminar, Arizona State University, February 20, 2009.

80. "A Brief Introduction to Dynamical Models, System Identification, and Control Systems Engineering," R21 Roadmap Initiative Panel Meeting, Prevention Research Center, Arizona State University, March 23, 2009.

81. "A Brief Introduction to Dynamical Models, System Identification, and Control Systems Engineering," R21 Roadmap Initiative Panel Meeting, Systems Neuroscience and Pain Lab, Stanford School of Medicine, March 25, 2009.

82. "A dynamical systems and control engineering perspective for optimizing behavioral interventions," Center for Tobacco Research and Intervention, University of Wisconsin-Madison, May 4, 2009.

83. "Inventory management in supply chains and adaptive interventions in behavioral health: insights gained from a process control perspective," Process Systems Research Group, Department of Chemical and Biological Engineering, University of Wisconsin-Madison, May 5, 2009.

84. "What it is like to be a Puerto Rican and a Chemical Engineer," presentation to early kindergarten class at Porter Elementary School, Mesa, Arizona, May 19, 2009.

85. “Inventory management in supply chains and adaptive interventions in behavioral health: insights gained from a process control perspective,” Systems and Control Seminar Series, Institute for Systems Theory and Automatic Control, University of Stuttgart, Germany, June 29, 2009.

86. “Connecting the dots in optimized behavioral interventions with control systems engineering,” 2009 fall retreat, The Methodology Center, Pennsylvania State University, December 8-9, 2009.

Research Grants

Sponsored Research

External Awards

Monetary Contributions : Total external support of $12,893,892, with investigator share corresponding to $3,049,780. (* denotes an ASU Foundation account)

	Date	ORCA #	Proposal Title	Sponsor	Sole, Main PI or Co-PI	Total Amount	% Rec.
1	5/15/91-8/15/91	EE5-1003	Identification and Robustness Issues in Horizon Predictive Control with Application to a Distillation Column	Honeywell Foundation	Main PI	$21,878	50%
2	9/1/91-8/31/93	ACA-2369	System identification for process control: control-relevant identification	National Science Foundation	Sole PI	$63,200	100%
3	8/1/91-5/31/94	703-1045*	Honeywell Graduate Fellowships	Honeywell Foundation	Co-PI	$150,000	50%
4	8/1/91-12/31/95	703-1075*	Unrestricted grants for system identification research	Shell Development Co.	Sole PI	$55,000	100%
5	1/1/92-12/31/92	703-1037*	1992 Program Funds-Control Systems Engineering Laboratory	Honeywell Industrial Automation and Control	Main PI	$85,000	50%
6	1/1/93-12/31/93	703-1037*	1993 Year Program Funds-Control Systems Engineering Laboratory	Honeywell Industrial Automation and Control	Main PI	$100,000	50%
7	5/15/93-6/30/98	ACT-4505	Control Systems Engineering Laboratory	DuPont Educational Aid Program	Sole PI	$54,000	100%
8	12/14/93	703-1045*	Honeywell Graduate Fellowships	Honeywell Foundation	Co-PI	$30,000	50%
9	4/13/94	703-1037*	1994 Program Funds-Control Systems Engineering Laboratory	Honeywell Industrial Automation and Control	Main PI	$100,000	50%
10	5/24/94	703-1045*	Honeywell Graduate Fellowships	Honeywell Foundation	Co-PI	$20,000	50%
11	12/15/94-12/31/97	DWT - 4599	A Control-Theoretic Approach to Scheduling of Semiconductor Fabrication Processess	Intel Research Council	Co-PI	$111,000	50%
12	7/12/95	703-1037*	1995 Program Funds-Control Systems Engineering Laboratory	Honeywell Industrial Automation and Control	Main PI	$100,000	50%
13	2/1/96-5/31/96	ACT-0001	Benefits of Advanced Process Control Methods in Semiconductor Manufacturing	Motorola Semi-Conductor Products Sector	Co-PI	$15,732	50%

	Date	ORCA #	Proposal Title	Sponsor	Sole, Main PI or Co-PI	Total Amount	% Rec.
14	5/15/96-5/15/97	GFT-4652	Improved Operation of the SO_2 Scrubbers at the Coronado Generating Station	ASU-SRP Joint Program	Sole PI	$15,467	100%
15	5/16/97-12/31/98	ACV-8256	Fellowship for Srinivas Adusumilli	Honeywell Technology Center	Sole PI	$16,200	100%
16	7/1/99 6/30/01	ACT-0027	Control Systems Engineering Laboratory	DuPont Educational Aid Program	Sole PI	$13,000	100%
17	7/16/00-8/31/01	GAA-0001	Designing and Managing Dynamic Supply Chains Using Model-On-Demand Predictive Control	National Science Foundation	Co-PI	$100,000	40%
18	4/1/01-12/31/02	XST-0051	A Modular, Scalable Approach to Modeling and Analysis of Semiconductor Supply Networks	Intel Research Council	Co-PI	$150,000	14%
19	3/1/02-8/31/05	ACT-0058	Constrained Multisine Inputs for Plant-Friendly Identification of Chemical Processes	American Chemical Society - Petroleum Research Fund	Main PI	$120,000	60%
20	7/1/02-12/31/04	ACT-0069	Supply Chain Management Research Using Process Control Approaches	Intel Research Council	Sole PI	$150,000	100%
21	7/1/03-12/31/04	AC9-1003	Honeywell support for the Control Systems Engineering Laboratory	Honeywell International Foundation	Sole PI	$25,000	100%
22	6/1/04-8/31/06	ACS-0013	Control Engineering Approaches to Adaptive, Time-Varying Interventions in Drug Abuse Prevention	National Institutes of Health - NIDA	Sole PI	$97,500	100%
23	10/1/04-3/31/06	ACS-0018	GOALI: Process Control Approaches to Supply Chain Management in Semiconductor Manufacturing	National Science Foundation	Main PI	$120,000	44%
24	11/1/04-10/31/07	ACS-0034	Improving Short-term Demand Forecasting in Supply Chain Management	Intel Research Council	Sole PI	$150,000	100%
25	3/1/05 – 2/28/10	KMS-0008	Phase II: Minority Graduate Education @ Mountain States Alliance (MGE@MSA)	National Science Foundation	Co-PI	$9,000,000	5%
26	3/24/05-9/30/07	ACS-0040	REU: GOALI: Process Control Approaches to Supply Chain Management in Semiconductor Manufacturing	National Science Foundation	Sole PI	$6,000	100%
27	9/1/06-9/30/07	ACS-0103	IREE: GOALI: Process Control Approaches to Supply Chain Management in Semiconductor Manufacturing	National Science Foundation	Sole PI	$17,000	100%

	Date	ORCA #	Proposal Title	Sponsor	Sole, Main PI or Co-PI	Total Amount	% Rec.
28	9/30/07-8/31/12	ACS-0120	K25 Mentored Quantitative Research Career Development Award: Control Engineering Approaches to Adaptive Interventions for Fighting Drug Abuse	National Institutes of Health – OBSSR and NIDA	Sole PI	$875,000	100%
29	9/26/07-7/31/11	ACS-0133	R21 Facilitating Interdisciplinary Research via Methodological and Technological Innovation in the Behavioral and Social Sciences: Dynamical Systems and Related Approaches to Improving Behavioral Interventions	National Institutes of Health – OBSSR and NIDA	Co-PI (with L.M. Collins of Penn State University)	$1,133,000	45%

In-kind Contributions (equipment, software , and service donations)

1. Computing Equipment Lease, ET7-1003, Digital Equipment Corporation, July 1, 1991 - June 30, 1993, in-kind contribution. Total equipment cost: $459,204.

2. Research Equipment (Two 90 MHz Pentium PC's), (with K. Tsakalis), $19,094.00, Intel Corporation, May 10, 1995.

3. Process Dynamics, Control, and Scheduling Research and Education. Intel Equipment Donation (five 600 Mhz Pentium III Dell computers), $17,430, October 1999.

4. Microsoft Software Donation (accompanying Intel Dell Donation): Windows NT Workstation, MS Office 2000, and Visual Studio, $9,985, October 1999.

5. PI system Donation, OSIsoft, $30,000, August, 2001.

6. Donations and discounts of equipment and services provided by Honeywell Industrial Automation and Control in support of the undergraduate process control laboratory. Since the original TDC3000 donation in 1990 (valued at over $1M), there have been two major hardware upgrades to the platform (in 2000 and 2003, estimated cost: $265,000); software upgrades have occurred almost yearly since 1990. Information regarding the current state of the Honeywell lab can be accessed from http://www.fulton.asu.edu/~csel/Courses-ChE461.htm.

7. Research Equipment (Four 3.2 Mhz Dell Pentium PCs; with H. Sarjoughian, CSE), Intel Corporation, $5,983.00, November 2004.

Internal Grants

1. "A control-relevant methodology for closed-loop identification," ACR-B709, ASU Faculty Grant-In-Aid Program, January 1 - December 31, 1991, $5,000.

2. "Understanding Engineering Systems Via a Brine-Water Mixing Tank Experiment," ASU Center for Research on Education in Science, Mathematics, Engineering, and Technology (CRESMET), $6,000, February 1 - June 30, 1999.

3. "Enterprise Systems and Supply Chain Dynamics Education for Chemical Engineering Undergraduates," ASU Center for Research on Education in Science, Mathematics, Engineering, and Technology (CRESMET), $10,000, February 15, 2001 - August 15, 2001.

4. "A Control-Oriented Framework for Strategic Analysis in Supply Chain Management," (with M. Carlyle, C. Kirkwood, H. Mittelmann, and D.L. Shunk), ASU Institute for Manufacturing Enterprise Systems (IMES) Seed Funding Initiative, $65,328.

5. "Computing Infrastructure Funds," Ira A. Fulton School of Engineering, Nov. 2004, $11,600.

6. "ERC 275 Office and 522 Lab Move Computer Equipment Funds," Ira A. Fulton School of Engineering, summer, 2007, $18,000.

Student Theses and Dissertations Supervised

Masters Theses Supervised

1. Emrod Elisante, "*Robustness and identification issues in Horizon Predictive Control with Application to a Binary Distillation Column,*" M.S., May, 1992.

2. Sujit V. Gaikwad, *"Advanced process control for distributed control systems via reduced-order controllers,"* M.S., May, 1993.

3. Manoj K. Shetty, *"Development of an Instructional Control Systems Engineering Lab Using the TDC 3000 System,"* M.S., December, 1993.

4. Saurabh Bhatnagar, Thesis title: *"Iterative Restricted Complexity Modeling via Closed-Loop Identification* " M.S., December, 1993.

5. Abhijit P. Desai,*"Towards the Development of Intelligent Process Control Strategies,"* M.S., December 1994.

6. Xiangqin Chen, *"Experimental Design for Robust Process Control Using Schroeder-Phased Input Signals,"* M.S., May, 1995.

7. Wei-Ming Ling, *"Modeling Strategies for Model-Based Process Control*," M.S.E., May, 1996.

8. Shan Zong, *"Minimal Crest Factor Input Signal Design and Frequency-Domain Curvefitting for Control-Relevant Identification,"* M.S., December 1997.

9. Raul Ortiz-Mojica, *"Minimum Crest Factor Input Design for Plant-Friendly Identification of Process Systems,"* M.S., August 2000.

10. Martin W. Braun, "*Model-on-Demand Model Predictive Control for Nonlinear Process Systems*," M.S.E., May, 2001.

11. Wenlin Wang, *"Model Predictive Control Strategies for Supply Chain Management in Semiconductor Manufacturing."* M.S.E, December, 2004.

12. Jay D. Schwartz, "*Stochastic Optimization and System Identification for Next-Generation Supply Chain Management*," M.S.E., May, 2007.

Doctoral Dissertations Supervised

1. Kyoung-Shik Jun, *"Control-Relevant Identification Methodology with Application to a High-Purity Distillation Column, "* Ph.D., August, 1995.

2. Sujit V. Gaikwad, *"Conrol Relevant Identification of Multivariate Systems in the Chemical Process Industries,"* Ph.D., December 1996.

3. Wei-Ming Ling, *"Control-oriented modeling of nonlinear process systems,"* Ph.D., December 1997.

4. Felipe Vargas-Villamil, *"Hierarchical Production Optimization and Inventory Control of Semiconductor Reentrant Manufacturing Lines*," Ph.D., May 1999.

5. Srinivas Adusumilli*, "Novel Methodologies for Integrated Identification and Robust Process Control,"* Ph.D. December 1999.

6. Martin W. Braun, *"Model-on-Demand Nonlinear Estimation and Model Predictive Control: Novel Methodologies for Process Control and Supply Chain Management,"* Ph.D., December 2001.

7. Wenlin Wang, *"Model Predictive Control strategies for supply chain management in semiconductor manufacturing."* Ph.D., August, 2006.

8. Hyunjin Lee, *"A plant-friendly multivariable system identification framework based on identification test monitoring,"* Ph.D., December, 2006.

9. Kevin Roche, *"Capacity planning and decision support methodologies in healthcare: a queueing and control-theory based approach,"* Ph.D., Industrial Engineering (co-chaired with Jeffrey Cochran), August, 2008.

10. Jay D. Schwartz,*"Next generation supply chain management: control, optimization, and system identification, "* Ph.D., December, 2008.

11. Richard N. Steenis, *"Plant-friendly input design for system identification and robust control performance,"* Ph.D. (Electrical Engineering), December 2009.

Current Graduate Student Projects in Progress

1. Sunil Deshpande, M.S. candidate, Electrical Engineering, *"A System Identification Study of a Low-Dose Naltrexone Intervention for Fibromyalgia,"* anticipated graduation date: December 2010.

Postdoctoral Research Associates Supervised

1. Kyoung-Shik Jun (Ph.D., Arizona State University), control engineering approaches to semiconductor manufacturing, 1995 – 1997.

2. Jun-Hyung Ryu (Ph.D., Imperial College), optimization and control of supply chain management systems in semiconductor manufacturing, 2002 – 2004.

3. Jesús Emeterio Navarro Barrientos (Ph.D., Humboldt University, Berlin), simulation and dynamic modeling of interventions for behavioral health, 2008 – present.

4. Naresh Nandola (Ph.D., IIT-Bombay), development of Model Predictive Control strategies for adaptive behavioral interventions, 2008 – present.

Professional and Scientific Service

Membership in Professional Societies

Senior Member, American Institute of Chemical Engineers (AIChE);
Senior Member, Institute of Electrical and Electronic Engineers (IEEE);
Member, American Society for Engineering Education (ASEE).
Member, Society for Prevention Research (SPR)
Member, Institute of Operations Research and the Management Sciences (INFORMS)

Conference Activities

1. Organizer and co-chairman, session on "System Identification for Control System Design", 1990 American Control Conference, San Diego, May 1990.

2. Panel member, session on "Dynamic Process Simulation, Modeling and Identification," Fourth International Conference on Chemical Process Control, South Padre Island, Texas, February 17-22, 1991.

3. Organizer and co-chairman, session on "Modeling and Identification for Robust Process Control" at the 1991 American Control Conference, Boston, June 1991.

4. Organizer and chairman, session on "Robust Process Control" at the 1992 American Control Conference, Chicago, June 1992.

5. Organizer and chairman, session on "Modeling and Identification for Control" at the 1992 AIChE Annual Meeting, Miami Beach, November, 1992.

6. Chairman, session on "Identification-V" at the 1993 American Control Conference, San Francisco, June, 1993.

7. Organizer and chairman, session on "Nonlinear Process Control" , 1993 AIChE Annual Meeting, St. Louis, November, 1993.

8. Chaired Student Paper Session at the IEEE/IFAC Joint Symposium on Computer-Aided Control System Design '94, March 8, 1994.

9. Chaired Session FA-10, "Fault Detection and Isolation" at the 1994 American Control Conference, July 1, 1994.

10. Moderator for Gordon Research Conference on Statistics in Chemistry and Chemical Engineering, topic: "System identification: modeling and parameter estimation from a control perspective, " August 1, 1994.

11. Co-chaired session on "Advanced Techniques for Industrial Applications," 1996 IFAC World Congress, San Francisco, July 1, 1996.

12. Chaired session “Chemical Processes” at the 1997 IFAC Symposium on System Identification (SYSID’97), Fukuoka, Japan, July 8-11, 1997

13. Organized and chaired invited session for the 1998 American Control Conference, Philadelphia, "Plant-friendly control-relevant identification for the process industries," June 24, 1998.

14. Co-chaired session in honor of W. David Smith, 1999 AIChE Annual Meeting, Dallas, November 3, 1999.

15. Registration Chair and member, International Program Committee, IFAC Symposium on System Identification (SYSID 2000), Santa Barbara, CA, June 21-23, 2000.

16. Organized and co-chaired session for SYSID 2000, Santa Barbara, CA, "Education and training in system identification," June 22, 2000.

17. Organized and co-chaired session for SYSID 2000, Santa Barbara, CA, "Input Sequences in Linear and Nonlinear Identification," June 23, 2000.

18. Panel Member, "Academic versus Corporate Research Environments", Minority CHE Faculty 2001+: A Workshop to Develop Minority Leaders in the ChE Academy, NSF headquarters, March 4-6, 2001, Arlington, VA.

19. Session Organizer and Chair, Session 10B12, Integration Between Scheduling, Planning and Control (joint with 10c), AIChE Annual Meeting, Reno, NV, November 2001.

20. Member, International Program Committee, IASTED Conference on Intelligent Systems and Control, held in Tsukuba, Japan, October 1-4, 2002.

21. Member, Technical Program Committee, 2003 American Control Conference held in Denver, Colorado June 4-6, 2003.

22. Session Chair for 2003 American Control Conference, Denver, "Control of Industrial Processes."

23. Member, International Program Committee, IFAC Symposium on System Identification (SYSID 2003), held in Rotterdam, The Netherlands, August 27-29, 2003.

24. Organizer and session co-chair for SYSID 2003, Rotterdam, The Netherlands, "Experimental Modeling for Process Control: Input Signal Design Considerations," August 28, 2003.

25. Organizer and session co-chair for SYSID 2003, Rotterdam, The Netherlands, "Education and training in system identification," August 29, 2003.

26. Organizer and session chair for tutorial session on Control-Oriented Approaches to Supply Chain Management in Semiconductor Manufacturing, 2004 American Control Conference, Boston, MA, July 2, 2004.

27. Session Chair for 2005 American Control Conference, Portland, "Modeling and Identification for Process Control"

28. Associate Editor for Interactive Papers, 2005 IEEE Conference on Decision and Control, Seville, Spain, December 2005.

29. Session Chair for 2005 IEEE Conference on Decision and Control and European Control Conference, Seville, Spain, "Control Education II," December 13, 2005.

30. Member, International Program Committee, 14th IFAC Symposium on System Identification (SYSID 2006), Newcastle, Australia, March 29- 31, 2006.

31. Session co-chair for the IFAC Symposium on System Identification (SYSID 2006), "Identification for control," Newcastle, Australia, March 29, 2006.

32. Session chair for the IFAC Symposium on System Identification (SYSID 2006), "Input and perturbation signal design for system identification I" Newcastle, Australia, March 31, 2006.

33. Co-organizer, two sessions for the IFAC Symposium on System Identification (SYSID 2006), "Input and perturbation signal design for system identification I and II" Newcastle, Australia, March 31, 2006.

34. Member, International Program Committee, IFAC Symposium on Advances in Control Education (ACE 2006), Madrid, Spain, June 21 – 23, 2006.

35. Session chair, IFAC Symposium on Advances in Control Education (ACE 2006), "Process Control Education II," June 23, 2006.

36. Member, International Program Committee, 2007 IEEE Conference on Decision and Control, New Orleans, LA, December 12 – 14, 2007.

37. Session Chair for the 2008 American Control Conference, Seattle, Washington, "System Identification I," June 11, 2008.

38. Member, International Program Committee, 2008 IEEE Multi-conference on Systems and Control, San Antonio, TX, Sept. 3 - 5, 2008.

39. Member, International Program Committee, 2008 IEEE Conference on Decision and Control, Cancún, Mexico, December 9 - 11, 2008.

40. Co-organizer, invited session for the 2008 IEEE Conference on Decision and Control, Cancún, Mexico, "Advances in LPV System Identification: Methods and Applications," Dec. 11, 2008.

41. Co-organizer and chair, special session for the 2009 American Control Conference, St. Louis, MO, "Control engineering and related systems approaches for improving behavioral health," June 11, 2009.

42. Member, International Program Committee, 15th IFAC Symposium on System Identification (SYSID 2009), Saint-Malo, France, July 6 – 8, 2009.

43. Session chair for the 15th IFAC Symposium on System Identification (SYSID 2009), "Applications I" St. Malo, France, July 7, 2009.

44. Member, International Program Committee, 18th IEEE International Conference on Control Applications (IEEE CCA 2009), St. Petersburg, Russia, July 8 – 10, 2009.

45. Member, International Program Committee, 8th IFAC Symposium on Advances in Control Education (ACE 2009), Kumamoto, Japan, October 21 - 23, 2009.

46. Member, International Program Committee, UK Automatic Control Council (UKACC) International Conference on Control (CONTROL 2010), Coventry, United Kingdom, September 7-10, 2010.

Journal Referee and Editorial Service

AIChE Journal, *IEEE Transactions on Automatic Control*, *IEEE Transactions on Control Systems Technology*, *Automatica*, *Chemical Engineering Science*, *International Journal of Control* , *I&EC Research*, *Computers and Chemical Engineering*, *Optimal Control: Applications and Methods, Journal of Process Control*

Reviewed papers for numerous American Control, Decision and Control, and IFAC conferences and symposia since 1990.

Associate Editor, *IEEE Control Systems Magazine* (2003 – 2007)

Guest Editor (with S. Fassois, Univ. of Patras), Special Section on Applications of System Identification, *IEEE Control Systems Magazine*, October, 2007.

Associate Editor, *IEEE Transactions in Control Systems Technology* (2003 – present)

Proposal Reviewer Service

Reviewed proposals for the National Science Foundation - Chemical Reaction Processes Program, the Division of International Programs, and the Division of Design, Manufacture, and Industrial Innovation; also have reviewed proposals for the National Research Council of Canada and the South African Foundation for Research Development.

Panel member for NSF Research Experience for Undergraduates Sites program, Fall 1995.

Panel member for NSF Information Technology Research Program, April, 2001; external reviewer, May, 2004.

Panel member for NIH National Heart, Lung, and Blood Institute, "Translating Basic Behavioral and Social Science Discoveries into Interventions to Reduce Obesity: Centers for Behavioral Intervention Development", June 1-2, 2009.

Other

Member, International Federation on Automatic Control (IFAC) Technical Committee on Modeling, Identification, and Signal Processing (October, 2003 – present).

Deputy Chair, IEEE Technical Committee on System Identification and Adaptive Control (May 2006 – June 2007).

Chair, IEEE Technical Committee on System Identification and Adaptive Control, July 2007 – present.

Member, Working Group on Benchmark Problem Papers, Technical Committee on Modeling, Identification, and Signal Processing (July 2009– present).

Short Course Development and Instruction

1. "An overview of distillation column control," presented at Icotron, Phoenix, June 11, 1991.

2. "Process identification for control system design," Instrument Society of America International Conference and Exhibit, Anaheim, CA, Oct. 30, 1991.

3. "Model-based tuning of PID and PID-like controllers," Instrument Society of America International Conference and Exhibit, Anaheim, CA, Oct. 30, 1991.

4. "System Identification for Process Control," short course offered to Honeywell Industrial Automation and Control, Phoenix, Arizona, June 20-24, 1994.

5. "PID Tuning from Plant Data Using Control-Relevant Models," tutorial seminar presented as part of the SEMATECH AEC/APC Workshop, New Orleans, LA, November 5, 1995.

6. "PID Tuning via Internal Model Control: A Modern Approach," short course offered to Mitsubishi Chemical, Mizushima, Japan, July 23, 1996.

7. "Control Methods for Process Applications," short course taught at Linköpings universitet Tekniska Högskolan - Institutionen för Systemteknik - Reglerteknik. Linköping, Sweden, Session One: Introduction to Internal Model Control, September 25, 1996, Session Two: Multivariable Control Issues, September 26, 1996, Session Three: Intro to Model Predictive Control, October 10, 1996, Session Four: Model Predictive Control Case Studies, October 11, 1996.

8. "System Identification for Process Control," short course for Honeywell IAC engineers, Phoenix, February 3, 5, and 19, 1997.

9. "Control Methods for Process Applications," short course for Honeywell Technology Center, Minneapolis, February 26-27, 1997

10. "Sintonización de controladores PID a partir de datos de planta utilizando modelos de control relevantes," (PID controller tuning from plant data using control-relevant models), workshop presented as part of the 2nd Congress of the Colombian Society for Automatic Control, Bucaramanga, Colombia, March 22, 1997.

11. "System Identification for the Process Industries: A Short Course," short course taught at Honeywell Technology Center, Minneapolis, May 12-14, 1997.

12. "System Identification for the Process Industries: A Short Course," short course taught at Mitsubishi Chemical, Mizushima, Japan, July 1-4, 1997.

13. "System Identification for the Process Industries: A Short Course," short course taught at ECOPETROL, Cartagena Refinery, Colombia, March 16-18, 1998.

14. Teaching activities with the Faculty of Technology at UKIM (University "St. Cyril and Methodius") in Skojpe, Macedonia, May 20-22, 1998. Course: "Control Methods for Process Applications"

15. "System Identification for the Process Industries: A Short Course," short course taught at Mitsubishi Chemicals, Kashima Plant, Japan, July 21-24, 1998.

16. "Principles of System Identification," short course for industry taught at the Center for Professional Development, Arizona State University campus, January 11-15, 1999.

17. "System Identification for the Process Industries: A Short Course," short course taught at REPSOL-YPF, Madrid, Spain, November 19-23, 2001.

18. "Principles of System Identification," short course taught at the Department of Chemical and Petroleum Engineering, University of Calgary, AB, Canada, October 16-18, 2002.

19. "Identificación de Sistemas para Aplicaciones en el Control de Procesos," (System Identification for Process Applications), presented at the CEA-IFAC (Spanish Automatic Control Council) Summer School, Playa de Calpe, Alicante, Spain, May 31 – June 4, 2004; *also listed as an invited talk*.

20. "Principles of System Identification," short course taught at the Department of Chemical and Petroleum Engineering, University of Calgary, AB, Canada, September 30 – October 2, 2004.

21. "Principios de la Identificación de Sistemas," (Principles of System Identification), short course presented at the Spanish National Distance Learning University (Universidad Nacional de Educación a Distancia -UNED), Madrid, Spain, October 10-14, 2005.

22. "Principles of System Identification," short course taught at the Department of Chemical and Petroleum Engineering, University of Calgary, AB, Canada, October 19–21, 2006.

23. "Principios de la Identificación de Sistemas," (Principles of System Identification), short course presented at the Spanish National Distance Learning University (Universidad Nacional de Educación a Distancia -UNED), Madrid, Spain, September 17 - 28, 2007.

24. "Principios de la Identificación de Sistemas," (Principles of System Identification), short course presented at the University of Almería, Andalucía, Spain, September 8 - 10, 2008.

25. "Principles of System Identification," short course taught at the Whirlpool Corporation Research and Engineering Center, Benton Harbor, Michigan, September 30 – October 2, 2009.

University Committee Service

University

1. Department Representative, ASU Academic Senate 1999-2001

2. Member, University Affairs Committee, ASU Academic Senate, 2000-2001.

3. CHE Department Representative, ASU Academic Senate, 2008-present.

College

1. Sub-taskforce on "Ability to Use Computers for Communications, Analysis and Design," Engineering Curriculum taskforce, member, fall 1990.

2. Member, College of Engineering Curriculum Committee, ECE 380 Probability and Statistics For Engineering Problem Solving Subcommittee

3. Member, Engineering Excellence 2000 - "Developments and Opportunities in Manufacturing" Task Team.

4. Member, Computer-Integrated Manufacturing Systems Research Center (CIMSYRC) Advisory Board, 1996-1998.

5. Member, ECE 384 Numerical Methods for Engineers Evaluation Committee

6. Department Representative, Dean's Advisory Personnel Committee, CEAS, 1997-2000.

7. Chair, CEAS Student Affairs Committee, 2000-2003.

8. Department Representative, Fulton School Sabbatical Review Committee, 2004 – 2006.

9. Department Representative, Math/Fulton School Liaison Committee, 2004 – 2007.

10. Member, Fulton Fellowship Enhancement Opportunities Committee, 2005 – 2007.

11. Department Representative, Fulton School Committee of Review, 2006 – 2007.

12. Department Representative, Fulton School Standards Committee, 2005 – 2007, 2008 – present.

Department

1. Chair, Chemical Engineering Graduate Recruiting and Affairs Committee, 1993-1996.

2. Member, Chemical Engineering Undergraduate Curriculum Committee, 1997-2001.

3. Member, Computers and Networking Committee, 1997-2000.
4. Member, Budget Committee, 1997 - 2007.
5. Member, ChE Faculty Search Committee, Atmospheric Chemistry, 1999-2000.
6. Member, ChE Faculty Search Committee, Biotechnology, 2000.
7. EEO/AA Representative, ChE Faculty Search Committee, Protein Engineering, 2000-2001.
8. EEO/AA Representative, ChE Faculty Search Committee, Semiconductor Mfg, 2001-2002.
9. Chair, ChE Faculty Search Committee, Process Design and Operations, 2000-2001, 2001-2002.
10. Member, CME Self-Study Committee, 2001-2002.
11. Member, CME Strategic Planning *Ad Hoc* Committee, 2001-2003.
12. Chair, Chemical Engineering Graduate Admissions Committee, 2003-2007 (member since 2001).
13. Chair, Chemical Engineering Awards Committee, 2008 – 2009.
14. Member, Graduate Program Committee, 2008 – present.
15. Member, Graduate Recruitment Committee, 2008 – present.
16. Member, ABET Committee, 2008 – present.

Instruction

Courses Taught (Overall teaching evaluation average (Q 8 – 16): 4.3/5; undergraduate courses only: 4.07/5; graduate-level courses only: 4.6/5)

Semester	Course #	Course Title	Course Contact Hours/Week	Enroll-ment
F-1990	CHE 461	Process Dynamics and Control (lecture only),	2	26
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1991	CHE 561	Advanced Process Control	3	8
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1991	CHE 461	Process Dynamics and Control	8 (two lecture hrs + two 3 hr lab sessions)	25
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1992	CHE 561	Advanced Process Control	3	13
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1992	CHE 461	Process Dynamics and Control	8 (two lecture hrs + two 3 hr lab sessions)	24
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1993	CHE 494/598	Computer-Based System Identification and Control	3	7
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1993	CHE 461	Process Dynamics and Control	8 (two lecture hrs + two 3 hr lab sessions)	29
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1994	ECE 384	Introduction to Numerical Methods	2	55
	CHE 494/598	Computer-Based System Identification and Control	3	6
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1994	CHE 461	Process Dynamics and Control	11 (two lecture hrs + three 3 hr lab	46

Semester	Course #	Course Title	Course Contact Hours/Week	Enroll-ment
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1995	CHE 494/598, EEE 598	Introduction to System Identification	3	16
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1995	CHE 461	Introduction to Process Dynamics and Control (also offered via Distance Learning and NTU as CH 541-W: Principles of Process Dynamics and Control)	11 (two lecture hrs + three 3 hr lab sessions)	48 (on-campus) 13 (via Distance Learning)
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1996	CHE 494/598, EEE 598	Introduction to System Identification (also taught via Distance Learning)	3	10
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1996 - S-1997		*On sabbatical with the Division of Automatic Control, Linköping University, Sweden and Honeywell Technology Center, Phoenix, Arizona*		
F-1997	CHE 461	Process Dynamics and Control (also offered via Distance Learning as CHE 598: Principles of Process Dynamics and Control	12 (three lecture hrs + three 3 hr lab sessions)	56
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-1998	CHE 494/598, EEE 598	Introduction to System Identification	3	19
	ECE100M	Introduction to Engineering – Modeling	2	39
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1998	ECE 394C	Understanding Engineering Systems via Conservation	5 (three lecture hrs + one 2 hr recitation)	21
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		

Semester	Course #	Course Title	Course Contact Hours/Week	Enroll-ment
S-1999	ECE 394C	Understanding Engineering Systems via Conservation	5 (three lecture hrs + one 2 hr recitation)	18
	ChE 494/561	Advanced Process Control	3	6
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-1999	ChE 461/598	Introduction to Process Dynamics and Control	12 (three lecture hrs + three 3 hr lab sections)	48
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-2000	ECE 394C	Understanding Engineering Systems via Conservation	9 (three lecture hrs + three 2 hr recitation sections)	55
	ChE 494/561	Advanced Process Control	3	11
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-2000	ChE 461/598	Introduction to Process Dynamics and Control	12 (three lecture hrs + three 3 hr lab sections)	58
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-2001	ChE 461/598	Introduction to System Identification, (7 on campus, 4 distance learning)	3	11
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
F-2001	ChE 461	Introduction to Process Dynamics and Control	12 (three lecture hrs + three 3 hr lab sections)	46
	CHE 591	Graduate Topical Seminar: Process Dynamics and Control		
S-2002	ECE 394C	Understanding Engineering Systems via Conservation	5 (three lecture hrs + one 2 hr recitation)	42

Semester	Course #	Course Title	Course Contact Hours/Week	Enroll-ment
S-2002 (Cont)	ChE 494/598	Introduction to System Identification (also offered via NTU as CH 767-W, 5 students on-campus, 3 via distance learning).	3	8
F-2002	ECE 100	Introduction to Engineering Design, two sections (4 credits ea.)	8	92
S-2003	ECE 100	Introduction to Engineering Design	4	45
	ChE 494/561	Advanced Process Control (also offered via NTU as CH 741-W, 4 on-campus, 2 via local distance learning, 4 via NTU).	3	10
F-2003*	ChE 461	Introduction to Process Dynamics and Control lecture	3	48
S-2004*	ChE 494/598	Introduction to System Identification (also offered through *ASUengineeringonline.com*; 6 students on-campus, 8 via distance learning).	3	14
F-2004*	ChE 461/598	Process Dynamics and Control lecture (also offered through *ASUengineeringonline.com*	3	36
	ChE 591	Chemical Engr. Graduate Seminar	1	20
S-2005*	ChE 494/598, EEE 598	Introduction to System Identification	3	11 total ChE 494 (2) ChE/EEE 598 (9)
F-2005*	ChE 461/598	Process Dynamics and Control lecture	3	26
S-2006*	ChE 494/598	Advanced Process Control	3	6 total ChE 494 (3) ChE 598 (3)
F-2006	ChE 461/598	Process Dynamics and Control	3	32 total ChE 461 (31) ChE 598 (1)
	ChE 591	Chemical Eng. Graduate Seminar	1	32
S-2007	ChE 231/501	Transport Phenomena I: Fluid Mechanics	3	56 total ChE 231 (55) ChE 501 (1)

Semester	Course #	Course Title	Course Contact Hours/Week	Enroll-ment
S-2007 (Cont)	ChE 494/598	Introduction to System Identification	3	21 total ChE 494 (9) ChE 598 (12)
F-2007 - S-2008		*On sabbatical*		
F-2008		*No courses taught (protected time K25 award)*		
S-2009	ChE 494/598	Introduction to System Identification	3	19 total ChE 494 (6) ChE 598 (13)
F-2009 S-2010		*No courses taught (protected time K25 award)*		

*reduced course load as a result of having paid 1 month release time per semester.

New Courses and Course Materials Developed

Undergraduate Level:

CHE 231: Transport Phenomena I: Fluid Mechanics

CHE 461: Introduction Process Dynamics and Control

ECE 100: Introduction to Engineering Design

ECE 384: Introduction to Numerical Methods

ECE 394C: Understanding Engineering Systems Using Conservation Principles

Graduate Level:

CHE 494/561: Advanced Process Control

CHE 494/598: Computer-Based System Identification and Control (1993, 1994)

CHE 494/598, EEE 598 Introduction to System Identification (first offered in 1995).

All graduate courses have been offered with a 494 equivalent. The 494 version has reduced workload requirements and is available as a technical elective to senior undergraduates.

All graduate courses (and a lab-free version of ChE 461) have been offered as Instructional Television courses via ASU's Distance Learning Service, National Technological University (NTU), or *ASUengineeringonline.com.*

New contents developed:

1990: A computer-aided design component was added to CHE 461. Students extensively used the CONSYD package developed at Wisconsin and Caltech to complete many of their homework assignments.

1991: Five new labs featuring the TDC 3000 system were added to CHE 461. These are:

A/B Mixing Reactor Operation
A/B Mixing Reactor Identification and Control
Furnace Control - Schematic and System Identification
Furnace Control - Process Point Building
Furnace Control - Custom Control Strategy Implementation

1992: The first edition of the lab manual for CHE 461 (70 pages in length) was co-authored with Gene Sater. Improvements were made to the Heat Exchanger and Furnace Control experiments; a formal lab introducing students to the TDC 3000 system architecture was also developed.

1993: The lab manual for CHE461 was revised and expanded. A new experiment implemented on the Honeywell TDC3000 system, "pH Dynamics and Control," was added to the laboratory,

introducing students to issues associated with the modeling and control of a highly nonlinear system.

1995:
1. Developed the first edition of a manuscript entitled "Internal Model Control: An Approach For Undergraduates" to supplement the undergraduate textbook for ChE 461
2. Enhanced ChE 461 Lab E (Mixing Tank Dynamics) Lab Experiment with sensor calibration module
3. Enhanced ChE 461 Labs D, J1, J2 (Gas Oil Furnace Identification and Control) with new MATLAB programs for system identification and control design (*ASUfurn* and *pIDtune*).

1996: MATLAB-based computer-aided design modules for CHE 494/598 (Introduction to System Identification) were completely redone for 1996.

1997:
1. Migrated to Matlab 5.1 and TDC3000 Release 500 in ChE 461
2. Developed an extensive World Wide Web page for ChE 461 (http://www.eas.asu.edu/~che461) which has now been replaced with *myASU*
3. Major revision to ChE 461 Labs D, J1 and J2 (Furnace Identification, Furnace Control) to include significant components relating to stochastic identification and control.

1998:
1. Developed an extensive World-WideWeb page for ChE 494/598 Intro to System Identification (http://www.eas.asu.edu/~che598); now available only via *myASU*.
2. Migrated to Matlab 5.2/SIMULINK 2.2 in ChE 494/598 Intro to System Identification
3. Taught ECE 394 Understanding Engineering Systems via Conservation for the first time, adding significant new content in system fundamentals and computer modeling
4. Created a nonlinear semiphysical modeling experiment for ECE 394 Systems based on the brine-water mixing tank and the Honeywell TDC3000 system.
5. Revamped the ECE 394 Systems recitation into a dedicated computer modeling session based on the use of Matlab with SIMULINK

1999:
1. Developed a significant computer modeling exercise for ChE 461 involving a highly nonlinear diabatic (i.e., non-adiabatic) continuous-stirred tank reactor (CSTR) problem.
2. Migrated to Matlab 5.3/SIMULINK 3 in ChE 461/598: Process Control
3. Revamped Lab E: Mixing Tank Dynamics in ChE 461 to include the reconciliation of a first-principles nonlinear model with tank data
4. Significantly revised Lab D: Gasoil Furnace Mixing Dynamics Experiment with the development of two graphically-based Matlab programs: *pIDfurn* and *furntune*
5. Substantially revised ChE 494/561 Advanced Process Control, which was taught in 1999 after a 7 year hiatus.

2000:
1. Created Blackboard 5 web sites for three courses (ECE 394 Systems, ChE 494/561, and ChE 461).
2. Incorporated the use of Global User Stations (GUS) into the laboratory component of ChE 461
3. Developed real-time GUS schematics for the heat exchanger and mixing tank experiments.

4. Developed a GUS display builder "primer" for undergraduate students, which allowed student teams to build their own GUS-based schematics on the gasoil furnace experiment.

2001:
1. Supply chain dynamics and control problems developed during our CRESMET project were incorporated as part of ChE 461
2. Had primary responsibility for the deconstruction of SCOB 191 and the corresponding enlargement of SCOB 192 with the new annex room B.

2002: Developed 23 presentations, four Excel-based modeling assignments, and two design projects as a first-time instructor for ECE 100 (in its recently revised format). One design project and several modeling assignments centered around a supply chain inventory management simulation inspired by a CRESMET grant in 2001 and Intel Research Council funding; see http://www.fulton.asu.edu/~csel/ECE100SCM.htm.

2003: Conducted significant lab upgrade and development efforts as a result of teaching ChE 461 during the fall semester; http://www.fulton.asu.edu/~csel/Courses-ChE461.htm

2004, 2005: Taught ChE 494/598 Introduction to System Identification and ChE 461/598 Process Dynamics and Control via *ASUengineeringonline.com.*

2006: Revised and offered ChE 494/598 (aka ChE 561) Advanced Process Control throught *ASUengineeringonline.com;* updated ChE 461/598 Process Dynamics and Control for the 120-hr curriculum.

2007: Taught ChE 231/501 Transport Phenomena I: Fluid Mechanics for the first time.

2009: Teaching ChE 494/598 Introduction to System Identification to undergraduate and graduate students in engineering using *ITSIE,* an Interactive Tool for System Identification Education developed in collaboration with the University of Almería and the Spanish National Distance Learning University (UNED).

Undergraduate Projects Supervised

1. Eira Rodriguez**,** "*Digital Implementation of PID-like Controllers,* " Regional Center for Minorities Project, summer 1991

2. Joe Anderson, *pH Reactor Dynamics and Control,* CHE 461 honors project, fall 1994.

3. Brian McNamara, *"Understanding Engineering Systems via a Brine-Water Mixing Tank,"* summer 1999.

4. Joseph Kuschner, IV, *Lab K - pH Reactor Control*, ChE 461 honors project, fall 1999.

5. Mark Szwast, *"A Comparative Study of Economic Order Quantity versus Process Control Approaches to Inventory Management in Supply Chains,"* summer 2001.

6. Jay D. Schwartz, *"Control-oriented perspectives on demand forecasting for tactical decision policies in supply chain management,"* spring 2004.

7. Michael Pew, *"Control-oriented approaches to Supply Chain Management"*, spring 2003 – fall 2005.

8. Scott Occhuizzo, *"Simulation development for fluid mechanical analysis of discrete-event high-volume manufacturing processes,"* summer and fall 2007.

9. Spencer Pratt, *"Weigh-IT: An interactive tool for weight gain/loss prediction,"* spring and summer, 2009.