

# Publications

Kostas S. Tsakalis

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**Summary:** 1 Book, 8 Book Chapters, 49 Journal Papers, 8 Patents, 102 Conference papers.  
Over 694 Journal-only citations (source: ISI Web of Science, Oct. 2010).

## I. Books

1. K. S. Tsakalis and P. A. Ioannou, *Linear Time-Varying Systems: Control and Adaptation*, Prentice-Hall, Englewood Cliffs, New Jersey, 1993.

## II. Book Chapters

1. S. Sabesan, K. Tsakalis, A. Spanias, L.D. Iasemidis, "A Robust Estimation of Information Flow in Coupled Nonlinear Systems," in *Computational Neuroscience*, Eds. W. Chaovalitwongse, P.M. Pardalos, P. Xanthopoulos, Springer Series on Optimization and its Applications, Springer Science, New York, v.38, 271-284, 2010.
2. A. Faith, S. Sabesan, N. Wang, D. Treiman, J. Sirven, K. Tsakalis, L.D. Iasemidis, "Dynamical analysis of the EEG and treatment of human status epilepticus by anti-epileptic drugs," in *Computational Neuroscience*, Eds. W. Chaovalitwongse, P.M. Pardalos, P. Xanthopoulos, Springer Series on Optimization and its Applications, Springer Science, New York, v.38, 305-316, 2010.
3. L.D. Iasemidis, S. Sabesan, N. Chakravarthy, A. Prasad, K. Tsakalis, "Brain Dynamics and Modeling in Epilepsy: Prediction and Control Studies," in *Complex Dynamics of Physiological Systems: From Heart to Brain*, Eds. S.K. Dana, P.K. Roy, J. Kurths, Springer Series on Complexity, Springer Verlag, The Netherlands, 185-214, 2009.
4. L.D. Iasemidis, S. Sabesan, L. Good, N. Chakravarthy, D. Treiman, J. Sirven, K. Tsakalis, "A new look into epilepsy as a dynamical disorder: seizure prediction, resetting and control," *Encyclopedia of Basic Epilepsy Research*, Ed. Philip Schwartzkroin, Elsevier, vol. 3, pp. 1295-1302, 2009.
5. H. Al-Nashash, S. Sabesan, B. Krishnan, J. George, K. Tsakalis, L. Iasemidis, S. Tong, "Single-Channel EEG Analysis," in *Quantitative EEG Analysis Methods and Clinical Applications*, Eds. Shanbao Tong and Nitish Thakor, Artech House, Norwood, MA, pp. 73-90, 2009.
6. S. Sabesan, L. Good, N. Chakravarthy, K. Tsakalis, P.M. Pardalos, L.D. Iasemidis, "Global optimization and spatial synchronization changes prior to epileptic seizures," Eds. C.J.S. Alves, P.M. Pardalos, L.N. Vicente, *Optimization in Medicine*, Coimbra, Portugal, July 20-22, 2005, Springer Series in Optimization and its Applications, Springer, pp. 103-125, 2008.

7. S. Sabesan, K. Narayanan, A. Prasad, L.D. Iasemidis, A. Spanias and K. Tsakalis, "Information flow in coupled nonlinear systems: Application to the epileptic human brain," In: *Data Mining in Biomedicine*, Series: Springer Optimization and Its Applications , Vol. 7, 483-504, P. Pardalos, V. Boginski, A. Vazacopoulos (Eds.), 2007.
8. P.A. Ioannou and K.S. Tsakalis, "Robust Discrete-Time Adaptive Control," in *Adaptive and Learning Systems: Theory and Applications*, Plenum Press, edited by K. S. Narendra, 1986.

### III. Journal Papers

- Recent Submissions
    - L.D. Iasemidis, S. Sabesan, N. Chakravarthy, A. Prasad, K. Tsakalis, "Brain Dynamics and Modeling in Epilepsy: Prediction and Control Studies," *International Workshop on Complex dynamics of physiological systems: From heart to brain*, Presidency College, Kolkata, India, Feb. 14-17, 2007, Springer Series on Complexity, Springer Verlag,(35 pages), B.V. 2009.
    - S. Sabesan, L. Iasemidis, K. Tsakalis, D.M. Treiman, J. Sirven, "Use of Dynamical Measures in Prediction and Control of Focal and Generalized Epilepsy," Eds. H. Zaveri, I. Osorio, in press.
1. L.B.Good, S. Sabesan, S.T. Marsh, K. Tsakalis, D.M. Treiman, L.D. Iasemidis, "Nonlinear Dynamics of Seizure Prediction in a Rodent Model of Epilepsy," *Nonlinear Dynamics, Psychology and Life Sciences*, v.14, 5, 411-434, 2010.
  2. L. Yang, J. Si, K.S. Tsakalis, A.A. Rodriguez, A. A., "Direct Heuristic Dynamic Programming for Nonlinear Tracking Control With Filtered Tracking Error," *IEEE Transactions on Systems, Man, and Cybernetics, Part B: Cybernetics*, Volume 39, Issue 6, 1617 - 1622, Dec. 2009.
  3. L. Yang, J. Si, K.S. Tsakalis, A.A. Rodriguez, A. A., "Performance Evaluation of Direct Heuristic Dynamic Programming Using Control-Theoretic Measures," *J. Intell. Robot Syst.*, 55, 177 - 201, 2009.
  4. Iasemidis LD, Tsakalis KS, Osorio I, et al., "Special Issue: Neuromodulation and Control of Epileptic Seizures, INTRODUCTION," *Int. J. of Neural Systems*, V.19, 3 Pages: V-VII, June 2009.
  5. S. Sabesan, L.B. Good, K.S. Tsakalis, A. Spanias, D.M. Treiman, L.D. Iasemidis, "Information Flow and Application to Epileptogenic Focus Localization From Intracranial EEG," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Volume 17, Issue 3, 244 - 253, June 2009.
  6. L.B. Good, S. Sabesan, S.T. Marsh, K. Tsakalis, D.M. Treiman, L.D. Iasemidis, "Control of Synchronization of Brain Dynamics Leads to Control of Epileptic Seizures in Rodents," *International Journal of Neural Systems (IJNS)* Volume: 19, Issue: 3, pp. 173-196, 2009.
  7. N. Chakravarthy, K. Tsakalis, S. Sabesan, L. Iasemidis, Homeostasis of Brain Dynamics in Epilepsy: A Feedback Control Systems Perspective of Seizures, *Annals of Biomedical Engineering* Volume 37, 3, 565-585, 2009.
  8. N. Chakravarthy, S. Sabesan, K. Tsakalis, L. Iasemidis, "Controlling epileptic seizures in a neural mass model," *Journal of Combinatorial Optimization*, Springer Sci. and Bus. Media, 17: 98-116, Jan. 2009.
  9. S. Sabesan, N. Chakravarthy, K. Tsakalis, L.D. Iasemidis, "Measuring resetting of brain dynamics at epileptic seizures: Application of global optimization and spatial synchronization techniques", *Journal of Combinatorial Optimization*, Springer Sci. and Bus. Media, 17: 74-97, Jan. 2009.
  10. Venkatraman Atti, Andreas Spanias, Kostas Tsakalis, Constantinos Panayiotou, Leon Iasemidis and Visar Berisha "Gradient Projection-Based Channel Equalization Under Sustained Fading," *Signal Processing*, Vol. 88, 2, 236-246, February 2008.

11. Kostas Tsakalis and Sachi Dash "Multivariable controller performance monitoring using robust stability conditions," *Journal of Process Control*, Vol. 17, 9, 702-714, October 2007.
12. Niranjana Chakravarthy, S. Sabesan, L.D. Iasemidis, K. Tsakalis, "Controlling synchronization in a neuron-level population model," *Intern. Journal of Neural Systems*, Vol. 17, No. 2, 123 - 138, April 2007.
13. A. Spanias, K. Huang, A. Natarajan, R. Ferzli, H. Kwon, V. Atti, V. Berisha, L. Iasemidis, H. Krishnamoorthi, P. Spanias, S. Misra, M. Banavar, K. Tsakalis, S. Haag, "Interfacing Java-DSP with a TI DSK for use in a Signal Processing Class," *ASEE Computers in Education Journal*, Vol. XVII, No. 3, pp. 27-35, Issue: July-Sep. 2007.
14. Kostas Tsakalis and Leon Iasemidis, "Control Aspects of a Theoretical Model for Epileptic Seizures," *International Journal of Bifurcation and Chaos*. Special Issue "Complexity: A Unifying Direction in Science," Vol. 16,7, 2006.
15. K. Tsakalis, Niranjana Chakravarthy, S. Sabesan, L.D. Iasemidis, P.M. Pardalos, "A feedback control systems view of epileptic seizures," *Cybernetics and Systems Analysis*, vol. 42, pp.483-495, 2006.
16. Niranjana Chakravarthy, Kostas Tsakalis, Leon D. Iasemidis, Andreas Spanias, "A Multi-dimensional Scheme for Controlling Unstable Periodic Orbits in Chaotic Systems," *Physics Letters A*, Nonlinear Science, 349, 116-127, 2006.
17. Awadhesh Prasad, Leon D Iasemidis, Shivkumar Sabesan and Kostas Tsakalis "Dynamical hysteresis and spatial synchronization in coupled non-identical chaotic oscillators," *PRAMANA - Journal of Physics*, Vol.64, No.4, 513-523, Apr. 2005.
18. L.D. Iasemidis, D-S Shiau, P.M. Pardalos, W. Chaovalitwongse, K. Narayanan, A. Prasad, K. Tsakalis, P. Carney and J.C. Sackellares, "Long-term prospective on-line real-time seizure prediction", *Clinical Neurophysiology*, Elsevier, 116, 532-544, Jan. 2005.
19. L.D. Iasemidis, K. Tsakalis, J.C. Sackellares, and P.M. Pardalos, "Comment on "Inability of Lyapunov Exponents to Predict Epileptic Seizures," *Physical Review Letters* 94, 019801, week ending 14 Jan. 2005.
20. H. Wu, K.S. Tsakalis, G.T. Heydt, "Evaluation of Time Delay Effects to Wide-area Power System Stabilizer Design," *IEEE Transactions on Power Systems*, V.19, 4, 1935-1941, Nov. 2004.
21. K.S. Tsakalis and J.C. Palais, "Improving a School's *U.S. News and World Report* Ranking," *Journal of Engineering Education*, V.93, 3, 259-263, July 2004.
22. B. Veeramani, K. Narayanan, A. Prasad, L.D. Iasemidis, A.S. Spanias, K. Tsakalis, "Measuring the direction and the strength of coupling in nonlinear Systems-a modeling approach in the State space," *Signal Processing Letters*, IEEE, V. 11, 7, 617-620, July 2004.
23. T. Ogasawara, K. Tsakalis, C. Hornberg, "Improving Low-Temperature Control on a Vertical Furnace Using Model-Based Temperature Control," *Semiconductor Manufacturing*, Semi, V. 5, 2, 161-166, Feb. 2004.
24. N. Chakravarthy, A. Spanias, L. D. Iasemidis, and K. Tsakalis, "Autoregressive Modeling And Feature Analysis Of DNA Sequences," *EURASIP Jasp* 2004:1 (2004) 13-28.
25. L.D. Iasemidis, D.-S. Shiau, W. Chaovalitwongse, J.C. Sackellares, P.M. Pardalos, J.C. Principe, P.R. Carney, A. Prasad, B. Veeramani, and K. Tsakalis, "Adaptive Epileptic Seizure Prediction System," *IEEE Transactions on Biomedical Engineering*, 50, 5, 616-627, May 2003.

26. K. Tsakalis, S. Dash, A. Green and W. MacArthur, "Loop-shaping controller design from input-output data: application to a paper machine simulator," *IEEE Transactions on Control Systems Technology*, Vol. 10, No. 1, 127-136, Jan. 2002.
27. E. Grassi, K. Tsakalis, S. Dash, S.V. Gaikwad, W. MacArthur and G. Stein, "Integrated Identification and PID Controller Tuning by Frequency Loop-Shaping," *IEEE Trans. Contr. Systems Technology*, 9, 2, 285-294, March 2001.
28. Suttipan Limanond and K.S. Tsakalis, "Adaptive and non-adaptive 'pole-placement' control of multi-variable linear time-varying plants," *Int. J. Control*, 74, 5, 507-523, 2001.
29. Suttipan Limanond and K.S. Tsakalis, "Model Reference Adaptive and Nonadaptive Control of Linear Time-Varying Plants," *IEEE Trans. Automat. Contr.*, 45, 7, 1290-1300, July 2000.
30. E. Grassi and K. Tsakalis, "PID Controller Tuning by Frequency Loop-Shaping: Application to Diffusion Furnace Temperature Control," *IEEE Trans. Contr. Systems Technology*, 8, 5, 842-847, Sept. 2000.
31. M. Beaudoin, E. Grassi, S.R. Johnson, K. Ramaswamy, K. Tsakalis, T.L. Alford and Y.H. Zhang, "Real-time composition control of InAlAs grown on InP using spectroscopic ellipsometry," *J. Vac. Sci. Technol. B* 18(3), pp. 1435-1438, May/Jun 2000.
32. Elena Grassi, Shane R. Johnson, Mario Beaudoin, and Kostas S. Tsakalis, "Temperature-composition determination based on modeling of optical constants of III-V compound semiconductors measured by spectroscopic ellipsometry," *J. Vac. Sci. Technol. B* 17(3), pp. 1223-1226, May/Jun 1999.
33. S.R. Johnson, E. Grassi, M. Beaudoin, M.D. Boonzaayer, K.S. Tsakalis, and Y.H. Zhang, "Closed-loop control of composition and temperature during the growth of InGaAs lattice matched to InP," *J. Vac. Sci. Technol. B* 17(3), pp. 1237-1240, May/Jun 1999.
34. S.R. Johnson, E. Grassi, M. Beaudoin, M.D. Boonzaayer, K.S. Tsakalis, Y.H. Zhang, "Feedback control of substrate temperature during the growth of near-lattice-matched InGaAs on InP using diffuse reflection spectroscopy," *Journal of Crystal Growth*, 201/202, pp. 40-44, 1999.
35. E. Grassi, S.R. Johnson, M. Beaudoin, K.S. Tsakalis, "Modeling of optical constants of InGaAs and InAlAs measured by spectroscopic ellipsometry," *Journal of Crystal Growth*, 201/202, pp. 1081-1084, 1999.
36. M. Yelverton, K. Tsakalis and K. Stoddard, "Factory-wide run-to-run process control," *Solid State Technology*, pp. 45-52, Dec. 1999.
37. S. Limanond, J. Si and K.S. Tsakalis, "Monitoring and Control of Semiconductor Manufacturing Processes," *IEEE Control Systems*, V. 18, 6, 46-58, Dec. 1998.
38. K.S. Tsakalis, "Bursting Scenarios in Adaptive Algorithms: Performance Limitations and Some Remedies," *Kybernetika*, 33, 1, 17-40, 1997.
39. K.S. Tsakalis, "Performance Limitations of Adaptive Parameter Estimation and System Identification Algorithms in the Absence of Excitation," *Automatica*, 32, 4, 549-560, 1996.
40. K.S. Tsakalis, M. Deisher and A. Spanias, "System Identification Based on Bounded Error Constraints," *IEEE Trans. Signal Proc.*, 43, 12, 3071-3075, Dec. 1995.
41. K.S. Tsakalis and Suttipan Limanond, "Asymptotic Performance Guarantees in Adaptive Control," *Int. J. of Adaptive Control and Signal Processing*, Vol. 8, 173-199, 1994.

42. K.S. Tsakalis, "Adaptive Control of Linear Time-Varying Plants: The Case of "Jump" Parameter Variations," *Int. Journal of Control* Vol. 56, No. 6, pp. 1299–1345, 1992.
43. K.S. Tsakalis, "Robustness of Model Reference Adaptive Controllers: An Input-Output Approach," *IEEE Trans. Automat. Contr.*, Vol. 37, No. 5, pp. 556–565, May 1992.
44. K.S. Tsakalis and P.A. Ioannou, "A New Indirect Adaptive Control Scheme for Time-Varying Plants," *IEEE Trans. Automat. Contr.*, AC-35, No. 6, pp. 697–705, June 1990.  
 • Also in "Advances in Adaptive Control. Edited by K.S. Narendra, R. Ortega and P. Dorato, IEEE Press, Piscataway NJ, 1991." (Selected reprints providing a review of the then state-of-the-art in adaptive control.)
45. K.S. Tsakalis and P.A. Ioannou, "Adaptive Control of Linear Time-Varying Plants: A New Model Reference Controller Structure," *IEEE Trans. Automat. Contr.*, AC-34, pp. 1038–1046, Oct. 1989.
46. K.S. Tsakalis and P.A. Ioannou, "Adaptive Control of Time-Varying Plants: Simple Examples," *Int. J. of Adaptive Control and Signal Processing*, Vol. 2, pp. 291–309, Dec. 1988.
47. K.S. Tsakalis and P.A. Ioannou, "Adaptive Control of Linear Time-Varying Plants," *Automatica*, Vol. 26, No. 4, pp. 459–468, July 1987.
48. P.A. Ioannou and K.S. Tsakalis, "A Robust Direct Adaptive Controller," *IEEE Trans. Automat. Contr.*, AC-31, No. 11, pp. 1033 – 1043, Nov. 1986.
49. K.S. Tsakalis, T.T. Tsotsis and G.J. Stiegel, "Deactivation Phenomena by Site Poisoning and Pore Blockage: The Effect of Catalyst Size, Pore Size and Pore Size Distribution," *Journal of Catalysis*, 88, pp. 188–202 July 1984.

#### IV. Patents

- Recent Filings
  - S.K. Dash, S.V. Gaikwad, K. Tsakalis, Apparatus and method for controller performance monitoring in a process control system Pub. No.: WO/2008/042895 Publication Date: 10.04.2008
  - Gaikwad; Sujit V.; Dash; Sachi K.; Tsakalis; Konstantinos S. "On-demand auto-tuner for a plant control system," *United States Patent Application 20070073422*, Publication Number: WO/2007/040953 Publication Date: 12.04.2007
  - Jassemidis, Leonidas, D; Tsakalis, Konstantinos, S; "Pacemaker for treating physiological system dysfunction," Publication Number: WO/2006/01982 Publication Date: 23.02.2006
- 1. S.K. Dash, S.V. Gaikwad, K.S. Tsakalis, "Apparatus and method for controller performance monitoring in a process control system ," *U.S. Patent No. 7,787,978*, August 31, 2010.
- 2. S.V. Gaikwad, S.K. Dash, K.S. Tsakalis, and G. Stein, "Auto-tuning controller using loop-shaping," *U.S. Patent No. 7,024,253*, April 4, 2006.
- 3. K.D. Stoddard, B.D. Schulze, and K. Tsakalis, "Run-to-run controller for use in microelectronic fabrication," *U.S. Patent No. 6,587,744*, July 1, 2003.
- 4. K. Stoddard, P.R. McHugh, and K. Tsakalis, "Temperature Control System for a Thermal Reactor," *U.S. Patent No. 6,441,350*, August 27, 2002.
- 5. K. Stoddard, P.R. McHugh, and K. Tsakalis, "Temperature Control System for a Thermal Reactor," *U.S. Patent No. 6,222,164 B1*, April 24, 2001.
- 6. K. Stoddard, P.R. McHugh, and K. Tsakalis, "Temperature Control System for a Thermal Reactor," *U.S. Patent No. 6,211,495 B1*, April 3, 2001.

7. K. Stoddard, P.R. McHugh, and K. Tsakalis, "Temperature Control System for a Thermal Reactor," *U.S. Patent No. 6,207,937 B1*, March 27, 2001.
8. K. Stoddard, J.B. Hugues, and K. Tsakalis, "Model Based Temperature Controller for Semiconductor Thermal Processors," *U.S. Patent No. 5,895,596*, April 20, 1999.

## V. Technical Reports

1. C. Taft, P. Wolf, K. Tsakalis, "Advanced Pulverizer Control: Design and Testbed Implementation," Final Report, EPRI, Palo Alto, CA, March 2004, 1004423.

## VI. Conference Papers (Refereed and Invited)

1. L.D. Iasemidis, S. Sabesan, L. B. Good, K. Tsakalis and D.M. Treiman, "Closed-loop control of epileptic seizures via deep brain stimulation in a rodent model of chronic epilepsy," 11th International Congress of the IUPESM, Medical Physics and Biomedical Engineering World Congress, Munich, Sept. 2009 (I).
2. L.D. Iasemidis, S. Sabesan, K. Tsakalis, D.M. Treiman, J. Sirven, "Seizure Prediction and Control of Epilepsy via Resetting of Brain Dynamics," 4th Int. Workshop on Seizure Prediction, Kansas City, Missouri, June 4-7, 2009 (I).
3. K. Tsakalis, "Chaos, Brain and Epilepsy," Keynote Talk, Chaotic Modeling and Simulation Int. Conf. CHAOS 2009, C.H. Skiadas Ed., Chania, Greece, June 2009 (I).
4. S. Sabesan, L. Good, K. Tsakalis, D. Treiman, L. Iasemidis, "Data Mining and Information Flow Analysis in Epilepsy," Data Mining in Biomedicine Conf. DMINBIO'09, AIT, Greece, May 2009 (I).
5. S. Sabesan, K. Tsakalis, A. Spanias, A. Papandreou-Suppappola, L.D. Iasemidis, "Use of Transfer of Entropy for focus localization in the epileptic brain," Sensor, Signal and Information Processing Workshop, Sedona, Arizona, May 11-14, 2008.
6. Charles Q. Zhan and Kostas Tsakalis, "A new robust-control-oriented system identification method," *Proc. 17th World Congress, The International Federation of Automatic Control*, 12371-12376, Seoul, Korea, July 6-11, 2008.
7. K. Tsakalis, "Failing Feedback as a Mechanism to Generate Epileptic Seizures," Conference on Computational Neuroscience 2008, University of Florida Gainesville, February 20-21, 2008 (Invited).
8. S. Sabesan, L.B. Good, K. Tsakalis, D.M. Treiman, L.D. Iasemidis "Epileptogenic focus localization from the interictal EEG via information flow analysis," *Epilepsia*, Meeting Abstract, V.49, p. 62, Suppl. 7, 2008.
9. L.B. Good, S. Sabesan, S.T. Marsh, K. Tsakalis, L.D. Iasemidis, D.M. Treiman "Automated seizure prediction and deep brain stimulation control in epileptic rats," *Epilepsia*, Meeting Abstract, V.48, p. 278, Suppl. 6, Oct. 2007.
10. Niranjan Chakravarthy, Shivkumar Sabesan, Andreas Spanias, Leon Iasemidis and Kostas Tsakalis, "A feedback systems approach to modeling neural firing-rate homeostasis," *46th IEEE Conference on Decision and Control*, 602 - 608, New Orleans, 12-14 Dec. 2007.
11. Kostas Tsakalis, Sachi Dash, "Adaptive PID Control using Filter-Banks and Frequency Loop Shaping," *European Control Conference 2007*, 1340-1347, Kos, Greece, July 2-5, 2007.
12. Charles Zhan and Kostas Tsakalis, "System Identification for Robust Control," *American Control Conference, 2007*, 846 - 851, New York, 9-13 July 2007.

13. L. Yang, J. Si, K. Tsakalis, A. Rodriguez, "Performance Analysis of Direct Heuristic Dynamic Programming using Control-Theoretic Measures," *International Joint Conference on Neural Networks, IJCNN 2007* 2504 - 2509, 12-17 Aug. 2007.
14. Vlassopoulos, N.; Reisis, D.; Lentaris, G.; Tombras, G.; Prosalentis, E.; Ritas, N.; Tsakalis, K.; "An approach for efficient design of digital amplifiers," *Proc. IEEE International Symposium on Circuits and Systems, ISCAS 2006*, 4 pp., 21-24 May 2006.
15. Natarajan, A.; Atti, V.; Spanias, A.; Tsakalis, K.; Iasemidis, L.; "A transform-domain G-PrOBE algorithm," *Proc. IEEE International Symposium on Circuits and Systems, ISCAS 2006*, 4 pp., 21-24 May 2006.
16. Kostas Tsakalis and Sachi Dash, "Implementation of controller performance monitoring on a MIMO example," *Proc. American Control Conference*, 5 pp., Minneapolis, 14-16 June 2006 (Invited).
17. Kostas Tsakalis, "A Feedback Control Systems View of Epileptic Seizures," *DIMACS Workshop on Data Mining, Systems Analysis and Optimization in Neuroscience*, Session W1, Feb 15-17, 2006, University of Florida, Gainesville, (Invited).
18. Kostas Tsakalis, "Closed-Loop Brain Stimulation: Simulation Studies and Insight for Control of Epileptic Seizures," *Second International Workshop on Seizure Prediction*, Session 4, National Institute of Neurological Disorders and Stroke, Hyatt Regency Bethesda, April 8 - 11, 2006 (Invited).
19. K. Tsakalis, N. Chakravarthy and L. Iasemidis, "Control of Epileptic Seizures: Models of Chaotic Oscillator Networks," *Joint 44th IEEE Conference on Decision and Control and European Control Conference (CDC-ECC'05)*, 2975 - 2981, Seville, Dec. 2005.
20. K. Tsakalis, N. Chakravarthy, and L. Iasemidis, "Theoretical Concepts of Control with Applications to Epilepsy," *3rd European Medical and Biological Engineering Conference (EMBEC)*, Prague, Nov. 2005.
21. S. Sabesan, L. Good, L. Iasemidis, K. Tsakalis and D. Treiman, "Epileptic Brain Dynamics and Information Flow," *3rd European Medical and Biological Engineering Conference (EMBEC)*, Prague, Nov. 2005.
22. L.D. Iasemidis, S. Sabesan, K. Tsakalis, L. Good, and D. Treiman, "Prediction and control of epileptic seizures: The basis for brain pacemakers in epilepsy", *3rd European Medical and Biological Engineering Conference (EMBEC)*, Prague, Nov. 20-25, 2005.
23. C. Hornberg, K. Tsakalis, A. Spanias, and K. Stoddard, "Improving Wafer Temperature Response in a Semiconductor Diffusion Furnace using Wafer Optimized Profile Temperature Controller," *6th European Advanced Equipment Control/Advanced Process Control (AEC/APC) Conference*, Dublin, Ireland, April 6-8, 2005.
24. N. Chakravarthy, K. Tsakalis, L.D. Iasemidis, and A. Spanias, "A Multi-Dimensional Scheme for Controlling Unstable Periodic Orbits in Chaotic Systems," *Proc. 24th IASTED Int'l Conf. on Modeling, Identification and Control*, No. 457-167, pp. 35-40, Innsbruck, Switzerland, Feb. 16-18 2005.
25. L.B. Good, S. Sabesan, L.D. Iasemidis, K. Tsakalis, D.M. Treiman, "Brain dynamical disentrainment by anti-epileptic drugs in rat and human status epilepticus," *Proc. of 26th Annual Int'l Conf. of the IEEE Engineering in Medicine and Biology Society, EMBC 2004*, V.1, 176 - 179, San Francisco, Sept. 1-5 2004.
26. L. Yang, J. Si, K.S. Tsakalis, A.A. Rodriguez "Understand direct NDP with linear quadratic regulation," *Proc. 2004 IEEE Int. Symposium on Intelligent Control*, pp. 374 - 379, Taipei, 2-4 Sept. 2004.

27. K. Tsakalis, "Prediction and Control of Epileptic Seizures," *International Conference and Summer School: Complexity in Science and Society, European Advanced Studies Conference V*, Patras and Ancient Olympia, Greece, 14-26 July 2004. (Invited)
28. C. Panayotou, A. Spanias and K. Tsakalis, "Channel Equalization Using the G-PROBE," *Proc. Int. Symposium on Circuits and Systems, ISCAS 2004*, V.3, pp. III - 501-504, Vancouver, May 23-26, 2004.
29. J.J. Flores-Godoy, K.S. Tsakalis, and K. Stoddard, "Nonlinear identification for diffusion/CVD furnaces," *5th European AEC/APC Conference*, poster session, Dresden, Germany, Apr. 14-16, 2004.
30. A. Papadopoulos and K. Tsakalis "Adaptive Control of an Inverted Pendulum," *Proc. 23rd IASTED Int'l Conf. on Modeling, Identification and Control*, No. 412-051, pp. 461-466, Grindelwald, Switzerland, Feb. 2004.
31. T. Thrasyvoulou, A. Spanias, K. Tsakalis, A. Natarajan, L. Iasemidis, "A Complex Gradient Projection Optimal Bounding Ellipsoid Algorithm for Adaptive Beamforming," *Proc. 23rd IASTED Int'l Conf. on Modeling, Identification and Control*, No. 412-193, p. 546, Grindelwald, Switzerland, Feb. 2004.
32. N. Chakravarthy, A. Spanias, L. Iasemidis, and K. Tsakalis, "Parametric Autoregressive Modeling of DNA Sequences," *Proc. 22nd IASTED Int'l Conf. on Modeling, Identification and Control*, No. 377-216, pp. 328-331, Innsbruck, Austria February 10 - 13, 2003.
33. T. Thrasyvoulou, K. Tsakalis, and A. Spanias, "J-DSP-Control: A Control Systems Simulation Environment," *Proc. 22nd IASTED Int'l Conf. on Modeling, Identification and Control*, No. 377-215, pp. 538-542, Innsbruck, Austria February 10 - 13, 2003.
34. T. Thrasyvoulou, K. Tsakalis and A. Spanias, "J-DSP-C, A Control Systems Simulation Environment For Distance Learning: Labs And Assessment," *Proc. 33rd ASEE/IEEE Frontiers in Education Conference*, T4E11-T4E16, Boulder, CO November 5-8, 2003.
35. D. Collins, J.J. Flores-Godoy, K.S. Tsakalis and F. Hoppensteadt, "Diffusion Bay Simulation and its Impact on the Overall FAB Performance: A Simplified Example," *Proc. of 2003 IEEE International Symposium on Semiconductor Manufacturing*, 315-318, Sept. 30-Oct. 2, 2003.
36. L. Yang, J. Si, K.S. Tsakalis and A.A. Rodriguez, "Analyzing and Enhancing Direct NDP Designs Using a Control-Theoretic Approach," *Proc. of 2003 IEEE International Symposium on Intelligent Control*, 529-532, Houston, Oct. 5-8 2003.
37. A. Prasad, K. Narayanan, K. Tsakalis and L.D. Iasemidis, "Hysteresis in coupled chaotic oscillators and application to epileptic seizures", *International Nonlinear Sciences Conference on Research and applications in the Life Sciences*, Vienna, Austria, February 7-9, 2003. (Invited)
38. K. Tsakalis and Sachi Dash, "Simple criteria for controller performance monitoring," *Proc. American Control Conf.*, 4985-4987, Anchorage, AK, May 8-10, 2002.
39. A. Spanias, V. Atti, Y. Ko, T. Thrasyvoulou, M. Yasin, M. Zaman, T. Duman, L. Karam, A. Papandreou, K. Tsakalis, "On-line laboratories for speech and image processing and for communication systems using J-DSP," *Proceedings of 2002 IEEE 10th Digital Signal Processing Workshop, and the 2nd Signal Processing Education Workshop*, 174-179, 13-16 Oct. 2002.
40. Ehsan Al-Dulaijan, Kostas Tsakalis, Alf Green, and Sachi Dash, "Multivariable Controller Performance Monitoring via Robust Stability Conditions," *Proc. IEEE APC 2001 Workshop*, Industry Appl. Society, 3-8, Vancouver, Canada, May 2001.
41. K. Tsakalis, J.-J. Flores-Godoy, K. Stoddard and B. Mack "Multivariable Temperature Control of Magnetic Anneal Furnace," *Proc. IASTED Intl., Conf. Modeling, Identification and Control*, 6-11, Feb. 19-22, 2001, Innsbruck, Austria.



42. K. Tsakalis, A. Papadopoulos, K. Stoddard, "Run-to-Run Control: Using Dead-Zones to Improve Speed-Variance Trade-off," *Proc. IASTED Intl. Conf. Modeling Identification and Control*, 131-135, Feb. 14-17, 2000, Innsbruck, Austria.
43. D. Collins, F. Golshani, F. Hoppensteadt, C. Ringhofer, J. Si, K. Tsakalis, "Interdisciplinary Research on Modeling and Scheduling of Semiconductor Manufacturing Operations," *ASEE2000*, Session 3647, St Louis, 2000.
44. D. Collins, J.-J. Flores-Godoy, F. Hoppensteadt, K. Tsakalis, "Minimum Inventory Variability Dispatching Policies - MIVP," *ASEE2000*, Session 2563, St Louis, 2000.
45. E. Grassi, K. Tsakalis, S. Dash, S. Gaikwad, G. Stein, "Adaptive/Self-Tuning PID Control by Frequency Loop-Shaping," *Proc. IEEE 39th Conf. Decision and Control*, V.2, 1099-1101, Sydney, Dec. 12-15, 2000.
46. K. Tsakalis, M. Yelverton, B. Cusson, K. Stoddard, B. Schulze, "Optimizing Diffusion Furnace Performance Using Run-To-Run Process Control," *SEMIPAC '99*, San Antonio, Jan. 24-27, 1999.
47. K. Tsakalis, M. Yelverton, B. Cusson, K. Stoddard, B. Schulze "Run-To-Run Control: Application To Oxidation Processes," *18th IASTED Int'l Conf. Modeling Identification and Control '99*, 156-159, Innsbruck, Austria, Feb. 15-18, 1999.
48. E. Grassi, R. Metzger, S. Johnson, K. Tsakalis, Y.-H. Zhang and A. Rodriguez, "System Identification and Control for ASU's Molecular Beam Epitaxy (MBE) Machines," *Proc. American Contr. Conf.*, V.6, 4568-4572, San Diego, June 1999.
49. A. Green, K. Tsakalis, W. MacArthur, S. Dash, "Integrated Identification and Robust Control for Paper Machines," *Proc. American Contr. Conf.*, V.6, 3970-3974, San Diego, June 1999.
50. S. Adusumilli, S. Dash, D. Rivera and K. Tsakalis, "A Comparison of Identification-Based Performance Bounds for Robust Process Control," *Proc. IEEE Intl. Conf. on Contr. Applic.*, V.1, 594-599, Hawaii, Aug. 1999.
51. M. Beaudoin, E. Grassi, S. R. Johnson, K. Ramaswamy, K. Tsakalis, T. L. Alford and Y.-H. Zhang, "Real-Time Composition Control of InAlAs Using Spectroscopic Ellipsometry," *North American Conference on Molecular Beam Epitaxy*, Banff AB, October 1999.
52. K. Tsakalis, A. Papadopoulos and K. Stoddard, "The Role of Dead-Zones in Improving Run-to-Run Control Performance," Sematech's AEC/APC Symposium XI, Vail CO, Oct. 1999.
53. A. Green, K. Tsakalis, W. MacArthur, S. Dash, "Control-Oriented Identification and Uncertainty Estimation for Paper Machines," *Proc. 1999 International Conference on Acoustics, Speech, and Signal Processing.*, V.4, 2279-2282, Phoenix, May 1999. (Invited)
54. K. Tsakalis, J.-J. Flores-Godoy and K. Stoddard, "Temperature Control of Diffusion/CVD Furnaces Using Robust Multivariable Loop-Shaping Techniques," *Proc. 38th Conf. Decision and Contr.*, V.4, 4192-4197, Phoenix, AZ, Dec. 1999. (Invited)
55. K. Tsakalis, and S. Dash, "Loop-Shaping Controller Design from Input-Output Data," *Proc. 38th Conf. Decision and Contr.*, V.2, 1511-1516, Phoenix, AZ, Dec. 1999. (Invited)
56. E. Grassi, K. Tsakalis, S. Dash, S. Gaikwad, W. MacArthur and G. Stein, "Integrated System Identification and PID Controller Tuning by Frequency Loop-Shaping," *Proc. 38th Conf. Decision and Contr.*, V.2, 1517-1522, Phoenix, AZ, Dec. 1999. (Invited)
57. K. Tsakalis and K. Stoddard, "Control Oriented Uncertainty Estimation in System Identification," *IASTED Modeling, Identification and Control '98 Conf.*, Grindelwald, Feb. 1998.

58. S. Adusumilli, D.E. Rivera, S. Dash and K. Tsakalis, "Integrated Identification and Robust PID Controller Design through Loop Shaping for Multi-Input Multi-Output Processes," *Proc. American Control Conf.*, V.2, 1230–1234, Jun. 1998.
59. J.J. Flores-Godoy, Y. Wang, D.W. Collins, F. Hoppensteadt and K. Tsakalis, "A Mini-Fab Simulation Model comparing FIFO and MIVP schedule policies (outer loop) and PID and H-infinity machine controllers (inner loop) for semiconductor diffusion bay maintenance," *IECON'98, 24th Annual Conf.*, IEEE Indust. Elec. Soc., V.1, 253–258, Aachen, Sep. 1998.
60. E. Grassi, S. Johnson, M. Beaudoin and K. Tsakalis, "Temperature-Composition Sensor Based on Modeling of Optical Constants of InGaAs and InAlAs Measured by Spectroscopic Ellipsometry," *Proc. Xth MBE SV Congress*, Cannes, Sep. 1998.
61. S. Johnson, E. Grassi, M. Beaudoin, M.D. Boonzaayer, Y.H. Zhang and K. Tsakalis, "Feedback Control of Substrate Temperature During the Growth of Near-Lattice-Matched InGaAs on InP Using Diffuse Reflection Spectroscopy," *Proc. Xth MBE SV Congress*, Cannes, Sep. 1998.
62. E. Grassi, S. Johnson, M. Beaudoin, and K. Tsakalis, "Temperature-composition sensor based on modeling of optical constants of III-V compound semiconductors measured by spectroscopic ellipsometry," *Proc. 17th North American Molecular Beam Epitaxy Conf.*, Pennsylvania, U.S.A., October 1998.
63. S. R. Johnson, E. Grassi, M. Beaudoin, M. D. Boonzaayer, K.S. Tsakalis, and Y. H. Zhang, "Closed-loop control of composition and temperature during the growth of InGaAs lattice matched to InP," *Proc. 17th North American Molecular Beam Epitaxy Conf.*, Pennsylvania, U.S.A., October 1998.
64. M. Tucker, E. Valdez, K. Tsakalis, M. Warren and K. Stoddard, "Improving Vertical Furnace Performance Using Model-Based Temperature Control," *AEC/APC Symposium X*, Vail CO, Oct. 1998.
65. K.S. Jun, D.E. Rivera, K.S. Tsakalis, H.M. Liaw, E. Hall, and C. Stein, "PID Optimization for Temperature Control of Epitaxial Growth," *Proc. ECS Conference*, 373–374, Montreal, Feb. 1997.
66. J.J. Kristoff, L.J. Song, K.S. Tsakalis and T.S. Cale, "Optimally Controlled Programmed Rate Deposition of Tungsten," *VLSI Multilevel Interconnect Conference*, Santa Clara, CA, June 1997.
67. J.J. Kristoff, L.J. Song, K.S. Tsakalis and T.S. Cale, "Programmed Rate and Optimal Control Chemical Vapor Deposition of Tungsten," *1997 Joint Int. Meeting, ECS/ISEC*, Paris, France, Sept. 1997.
68. K.S. Tsakalis, J.J. Flores-Godoy and A.A. Rodriguez, "Hierarchical Modeling and Control of Re-Entrant Semiconductor Fabrication Lines: A Mini-Fab Benchmark," *Proc. 6th IEEE Int. Conference on Emerging Technologies and Factory Automation*, 508–513, Los Angeles, Sept. 1997.
69. K.S. Tsakalis and K.D. Stoddard, "Integrated Identification and Control for Diffusion/CVD Furnaces" *Proc. 6th IEEE Int. Conference on Emerging Technologies and Factory Automation*, 514–519, Los Angeles, Sept. 1997.
70. M.K. ElAdl, A.A. Rodriguez and K.S. Tsakalis, "Hierarchical Modeling and Control of Re-Entrant Semiconductor Manufacturing Facilities," *Proc. 35th Conference on Decision and Control*, 1736–1742, Kobe, Japan, Dec. 1996.
71. E. Grassi and K.S. Tsakalis, "PID Controller Tuning by Frequency Loop-Shaping," *Proc. 35th Conference on Decision and Control*, 4776–4781, Kobe, Japan, Dec. 1996.
72. L. Song, S. Shen, K.S. Tsakalis, P.E. Crouch and T.S. Cale, "Optimal Control for Increasing Throughput in Low Pressure Chemical Vapor Deposition," *Proc. 35th Conference on Decision and Control*, 4831–4836, Kobe, Japan, Dec. 1996.

73. C. Alexander and K.S. Tsakalis, "Control of an Inverted Pendulum: A Classical Experiment Revisited," *Proc. of 1995 Soc. for Comp. Sim. Western Multi-Conference*, Las Vegas, NV, Jan. 1995.
74. T.S. Cale, P.E. Crouch, L. Song and K.S. Tsakalis, "Optimal Control for LPCVD," *Proc. Symposium on Process Control, Diagnostic and Modeling in Semiconductor Manufacturing*, The Electrochemical Society, Vol. 95-2, 97-107, Reno, May 1995.
75. T.S. Cale, P.E. Crouch, L. Song and K.S. Tsakalis, "Increasing Throughput in Low Pressure Chemical Vapor Deposition: An Optimal Control Approach," *Proc. American Control Conf.*, 1289-1293, Seattle, June 1995.
76. T.S. Cale, P.E. Crouch, S. Shen and K.S. Tsakalis, "A Simple Adaptive Optimization Algorithm for the Tungsten LPCVD Process," *Proc. American Control Conf.*, 1294-1298, Seattle, June 1995.
77. K.S. Tsakalis, "Bursting Scenarios and Performance Limitations of Adaptive Algorithms in the Absence of Excitation," *3rd IEEE Mediterranean Symposium on New Directions in Control and Automation*, Vol. 1, 256-264, Limassol, Cyprus, July 1995.
78. Peter E. Crouch, Lijuan Song, Kostas S. Tsakalis and Timothy S. Cale, "Optimal Control Processing to Increase Single Wafer Reactor Throughput In LPCVD," *Proc. Fourth IEEE/UCS/SEMI International Symposium on Semiconductor Manufacturing*, 233-238, Austin, Sept. 1995.
79. T.S. Cale, P.E. Crouch, S. Shen and K.S. Tsakalis, "Run-to-Run Adaptive Optimization of a Tungsten Silicide LPCVD Process," *Proc. 34th Conf. on Decision and Control*, V.3, 2474-2475, New Orleans, Dec. 1995.
80. K.S. Tsakalis, "Control and Identification of Linear Time-Varying Plants Using I/O Methods," *Proc. 34th Conf. on Decision and Control*, 2527-2532, New Orleans, Dec. 1995. (Invited)
81. P.E. Crouch, T.S. Cale, S. Shen, L. Song and K.S. Tsakalis, "Optimal Control for LPCVD Processes," *Proc. 7th Sematech AEC and APC Workshop*, New Orleans, Nov. 1995.
82. K.S. Tsakalis, "Performance Limitations of Adaptive Parameter Estimation and System Identification Algorithms in the Absence of Excitation," *Proc. American Control Conference*, 1260-1264, Baltimore, 1994.
83. S. Limanond and K.S. Tsakalis, "Adaptive and non-Adaptive "Pole-Placement" Control of Multivariable Linear Time-Varying Plants," *Proc. American Control Conference*, 455-459, Baltimore, 1994.
84. K.D. Stoddard, P.E. Crouch, M. Kozicki and K.S. Tsakalis, "Application of Feed-Forward and Adaptive Feedback Control to Semiconductor Device Manufacturing," *Proc. American Control Conference*, 892-896, Baltimore, 1994.
85. K.S. Tsakalis and L. Song, "Set-Membership Estimation for Weakly Nonlinear Models: An Application to the Adaptive Control of Semiconductor Manufacturing Processes," *Proc. 33rd Conf. on Decision and Control*, 1066-1071, Lake Buena Vista, 1994.
86. S. Limanond and K.S. Tsakalis, "Model Reference Adaptive and non-Adaptive Control of Multivariable Linear Time-Varying Plants: The Exact Matching Case," *Proc. 32nd Conf. on Decision and Control*, 3072-3077, San Antonio, Dec. 1993.
87. K.S. Tsakalis and S. Limanond, "On Certain Performance Issues Arising in Adaptive Control," *Proc. American Control Conf.*, San Francisco, June 1993.
88. K.S. Tsakalis, "On the Identification and Control of Linear Time-Varying Systems," *Proc. 1993 American Control Conf.*, San Francisco, June 1993. (Invited)

89. K. S. Tsakalis and P. E. Crouch, "A Simple Adaptive Controller for an Oxidation Process," *Proc. American Control Conf.*, Chicago 1992.
90. K. S. Tsakalis, M. Deisher and A. Spanias, "Adaptive FIR Filtering Based on Bounded Error Constraints," *Proc. 26th Asilomar Conference on Signals, Systems and Computers*, V.1, 15–19, Oct. 1992.
91. K. S. Tsakalis and S. Limanond, "Adaptive Control of Time-Varying Systems: An Application to the Attitude-Momentum Control of the Space Station," *Proc. 31st Conf. on Decision and Control*, 1285–1286, Tucson, Dec. 1992.
92. K.S. Tsakalis and P.E. Crouch, "A Simple Adaptive Controller for an Oxidation Process," presented at the *NSF-Washington University Workshop on Nonlinear Control*, St. Louis, May 1992. (Invited)
93. K. S. Tsakalis, "The  $\sigma$ -modification in the Adaptive Control of Linear Time-Varying Plants," *Proc. 31st Conf. on Decision and Control*, 694–698, Tucson, Dec. 1992. (Invited)
94. K. S Tsakalis, "Adaptive Control of Linear Time-Varying Plants: The Case of "Jump" Parameter Variations," *Proc. American Control Conf.*, 1235–1236, Boston, June 1991.
95. K. S. Tsakalis, "Robustness of Model Reference Adaptive Controllers: Input-Output Properties," *Proc. 28th Conf. on Decision and Control*, 1025–1030, Tampa, Dec. 1989. (Invited)
96. K. S. Tsakalis and P. A. Ioannou, "Parameter Estimation and Pole-Placement Control of Time-Varying Plants," in *Proc. American Control Conf.*, 1636–1641, Atlanta, 1988. (Invited)
97. P. A. Ioannou and K. S. Tsakalis, "The Class of Unmodeled Dynamics in Robust Adaptive Control," in *Proc. American Control Conf.*, 337–342, Atlanta, 1988. (Invited)
98. K. S Tsakalis and P. A. Ioannou, "A New Indirect Adaptive Control Scheme for Time-Varying Plants," in *Proc. 27th Conf. on Decision and Control*, 2419–2424, Austin, Dec. 1988. (Invited)
99. K. S. Tsakalis and P. A. Ioannou, "Adaptive Control of Linear Time-Varying Plants: A New Controller Structure," in *Proc. American Control Conf.*, 583–588, Minneapolis, 1987.
100. K. S. Tsakalis and P. A. Ioannou, "On the Model Reference Adaptive Control of Time-Varying Plants," in *Proc. 26th Conf. on Decision and Control*, 354–359, Los Angeles, 1987.
101. K. S. Tsakalis and P. A. Ioannou, "Adaptive Control of Linear Time-Varying Plants," *Proc. 2nd IFAC Workshop on Adaptive Systems in Control and Signal Processing*, 233–238, Lund, 1986.
102. P. A. Ioannou and K. S. Tsakalis, "A Robust Discrete-Time Adaptive Controller," *Proc. 25th Conf. on Decision and Control*, 838–843, Athens, Greece, 1986.

## Sponsored Research Projects

1. L. Iasemidis(PI), K. Tsakalis, D. Treiman, "Characterization of Novel Vagus Nerve Stimulation (VNS) Parameters Efficacy, Based on Desynchronization of Brain Dynamics, in Open and Closed-Loop Configurations: A Study in an Animal Model of Chronic Epilepsy," Cyberonics Inc., 05/27/10-10/31/11, \$560,000.
2. L. Iasemidis(PI), K. Tsakalis, D. Treiman, "Vagus Nerve Stimulation: A Bioengineering Approach to Assess its Effect on Resetting the Epileptic Brain Dynamics," NIH R21 NS061310-01A2, Apr.09-Apr.11, \$414,714.
3. L. Iasemidis(PI), J. Sirven, K. Tsakalis, "Optimizing Multidimensional Time Series Classification: Spatio-Temporal Data Mining in Epileptic Brain Dynamics," Science Foundation of Arizona CAA 0281-08; Jul.08-Jul.09, \$267,000

4. A.A. Rodriguez (PI), J. Anderies, N. Macia, K. Tsakalis, B. Welfert, "Evaluation of a Suite of Interactive Modeling, Controls, Rapid Prototyping, and Embedded System E-Book Modules," National Science Foundation, DUE-0817584, 7/15/2009 - 12/31/2010 \$49,910.
5. K. Tsakalis (PI), L. Iasemidis, and D. Treiman, "Cyber Systems: Closed-Loop Control of Brain Dynamics in Epilepsy," National Science Foundation, ECS-0601740, June 1, 2006 - May 31, 2010 \$240,000.
6. K. Tsakalis (PI), J. Si, and A. Rodriguez, "Embedded Control Systems II," Consortium for Embedded Systems, 11/1/2005-12/31/2006 (5/15/2007), \$43,013.
7. L. Iasemidis (PI), K. Tsakalis, and D. Treiman, "Seizure Control by Closed Loop Feedback in a Rat Model of Chronic Temporal Lobe Epilepsy," Epilepsy Foundation, July 1, 2005 - June 30, 2006 \$100,000.
8. A. Rodriguez, (PI), K. Tsakalis, D. Allee, J. Si, "Rapid Prototyping for Embedded System Applications Via High Level Development Tools," NSF, DUE 0443133, 5/1/2005-4/30/2007, \$75,000
9. J. Si (PI), A. Rodriguez, K. Tsakalis, "A Control-Theoretic Approach to Learning and Approximate Dynamic Programming (ADP) with Applications to High Performance Racing," NSF, 5/1/04-4/30/07, \$190,000.
10. A. Rodriguez (PI), J. Si, K. Tsakalis, "A Flexible Embedded System Architecture and Methodology for Integrated Real-Time Health Monitoring, Modeling, Control Law Design, and Implementation," Consortium for Embedded and Internetworking Technologies, 8/25/04-8/24/05, \$75,137.
11. K. Tsakalis (PI), J. Si, and A. Rodriguez, "Embedded Control Systems: Undergraduate Course Development," Consortium for Embedded and Internetworking Technologies, 1/1/04-5/15/05, \$56,588.
12. A. Spanias (PI), T. Duman, L. Karam, A. Papandreou, and K. Tsakalis, "On Line Undergraduate Laboratories in Signal and Image Processing, Communications, and Controls," NSF DUE 0089075, 1/1/01 - 12/31/03, \$425,000.
13. K.S. Tsakalis, "Advanced Process Control in Semiconductor Manufacturing," SEMY Engineering/Brooks Automation, 8/15/95 - 8/14/03, \$188,027.  
— Equipment Donation, 1999-2001, \$325,000.
14. A.A. Rodriguez (PI), W. Higgins, J. Si, K.S. Tsakalis, and F. Hoppensteadt, "MOSART: A Model Undergraduate Multidisciplinary Controls Laboratory," NSF DUE 9851422, 8/15/98 - 7/31/01, \$95,442.
15. K.S. Tsakalis, "Advanced Process Control In Paper Production," Honeywell Technology Center, Phoenix, 9/1/98-8/31/99, \$24,999.
16. K. Tsakalis (PI) and A. Rodriguez, "Integrated Multi-Sensor Control for MBE Control of III-V Nanostructures." ARPA, 7/7/95-9/28/98, \$150,041. (ASU, Sensor group; part of a multi-university/industry proposal)
17. K.S. Tsakalis (PI) and D.E. Rivera, "A Control-Theoretic Approach to Scheduling of Semiconductor Fabrication Processes," INTEL Research Council, 1/1/95-12/31/97, \$111,000.
18. D.E. Rivera (PI) and K.S. Tsakalis, "Benefits of Advanced Process Control Methods in Semiconductor Manufacturing," Motorola SPS, 2/1/96-5/31/96, \$15,732.
19. P.E. Crouch (PI), T.S. Cale, G.B. Raupp, D.K. Ferry, M.N. Kozicki, K.S. Tsakalis and C. Ringhofer, "Mathematical Modeling for Simulation and Control of Semiconductor Processing," DoD-URI (ARPA), 10/1/92-5/31/96, \$693,000.

20. W.T. Higgins (PI), P.E. Crouch, A.A. Rodriguez and K.S. Tsakalis, "Undergraduate Control Systems Design Laboratory," NSF, USE-9251934, 5/1/92–10/31/94, \$50,232.
21. K.S. Tsakalis, "Parameter Estimation In Adaptive Control," NSF-RIA, ECS-9111346 9/1/91–2/28/94, \$59,956.
22. D. Rivera (PI) and K.S. Tsakalis, "Robust Adaptive Process Control of Chemical Processes with Implementation on the TDC 3000," (within the "ASU-Honeywell Control Systems Engineering Program" by D. Shunk and D. Rivera) Honeywell Industrial Automation and Controls Division; 3/26/93–3/25/94 and 4/16/92–8/7/92, \$12,284 (Summer support).

### Internal Grants

1. L. Iasemidis (PI), J. Si, A. Spanias and K. Tsakalis, "Dynamical Modeling and Control of Epileptic Seizures," Fulton School of Engineering, Seed Funding Award, \$48,000, June 2003-June 2004.
2. K.S. Tsakalis, ASU-RIA on the project "Design of Estimators for Adaptive Controllers with Robust Performance," 9/5/89–9/4/90, \$20,000 (funds from VPR and EE Dept).
3. K.S. Tsakalis, "Design of Robust Adaptive Controllers," DWR-B594, ASU-FGIA, 1/1/89–12/31/89, \$3,285.
4. K.S. Tsakalis, "Performance Issues in Adaptive Control," DWR-B677, ASU-FGIA, 1/1/90–12/31/90, \$3,000.

### Graduated Students

#### Ph.D.

- C. Zhan (August 2008): System Identification for Robust Control.
- J. Dankert (May 2008, with J. Si): Approaches to Asynchronous Control of Motor Cortical Neural Prosthetics.
- S. Sabesan (May 2008, with L. Iasemidis): Spatiotemporal Brain Dynamics In Epilepsy: Application To Seizure Prediction And Focus Localization.
- N. Chakravarthy (May 2007, with L. Iasemidis): Modeling and Controlling Epileptic Seizures - A Feedback Control Systems Perspective
- J.J. Flores-Godoy (Dec. 2002): Nonlinear identification for diffusion/Chemical Vapor Deposition furnaces.
- E. Grassi (Dec. 1999): Proportional-integral-derivative controller tuning by frequency loop-shaping.
- G. Nair (Apr. 1998, with A. Spanias): Fast adaptive algorithms using eigenspace projections.
- L. Song (May 1997): Optimal control problems in chemical vapor deposition.
- A. Abdalla (May 1996): Control of linear time-varying systems.
- S. Limanond (Aug. 1994): Adaptive and non-adaptive control of multivariable linear time-varying plants.

#### M.S.

- Rajendra Bhat (Dec. 2009): Controller Switching and Optimal State Selection
- Harikrishnan Raghunathan (Dec. 2007): Observer techniques for nonlinear systems.

- Manikandan Ponnuswamy (Dec. 2005, with L. Iasemidis): Dynamical Analysis Of Epileptic Seizures Using Synchronization-Based Measures.
- C. Hornberg (Dec. 2004): Wafer Optimized Profile Temperature Control of a Semiconductor Diffusion Furnace
- T. Thrasyvoulou (Aug. 2003, with A. Spanias): Adaptive beamforming using a complex bounding ellipsoid algorithm with gradient projections.
- Aris Papadopoulos (Dec. 2002): Swinging up the inverted pendulum by energy adaptive proportional-integral-derivative control.
- Kaushik Bhatt (Dec. 2002): Performance Monitoring of Controllers.
- J. Kristof (May 2000, with T. Cale): Optimal programmed rate chemical vapor deposition of tungsten.
- J. Frigo (Dec. 1996): An analog neural network control method proposed for use in spacecraft systems.
- C. Alexander (May 1995): System modeling and control of an inverted pendulum: an input-output approach.
- K. Stoddard (Sep. 1994, with P. Crouch and M. Kozicki): Application of feedforward and adaptive feedback control to semiconductor device processing.
- C.C. Kok (May 93): Application of neural network in the control of an oxidation process.
- Y.N. Liao (May 1992): Constrained parameter estimation in model reference adaptive control.
- S. Limanond (Dec. 1991): Decentralized adaptive linear quadratic control for time-varying systems.