

Tyrone L. Vincent

School Address

Department of Electrical Engineering and Computer Science
Colorado School of Mines
1500 Illinois St.
Golden, CO 80401
(303) 273-3641

EDUCATION

Doctor of Philosophy, Electrical Engineering
University of Michigan, Ann Arbor, MI December 1997
Thesis: Nonlinear System Identification and Estimation with Applications to Reactive Ion Etching.

Master of Science, Electrical Engineering
University of Michigan, Ann Arbor, MI May 1994

Bachelor of Science, Electrical Engineering
University of Arizona, Tucson, AZ May 1992

PROFESSIONAL EXPERIENCE

Colorado School of Mines, Golden CO August 2012 – present
Professor

Colorado School of Mines, Golden CO January 2012 – August 2012
Interim Department Head, Department of Electrical Engineering and Computer Science

Colorado School of Mines, Golden CO August 2004 – August 2012
Associate Professor

Colorado School of Mines, Golden CO January 1998 – August 2004
Assistant Professor

HONORS and AWARDS

IEEE Senior Member 2012
Japan Society for the Promotion of Science Fellow 2010
Second Place, best paper in IEEE/IAS Transactions on Industry and Applications 2003
NSF CAREER Award 2002
National Science Foundation Graduate Fellow 1992-1996

RESEARCH SUPPORT

| | |
|-----------|--|
| 2012-2014 | Scale-bridging Modeling Tools to Assist the Design and Development of Electrochemical Power Sources, Office of Naval Research |
| 2011-2012 | Evaluation and Extension of Threaded Control Methods, GLOBALFOUNDRIES |
| 2010-2012 | Biomass Fuel Cell Systems, Department of Energy. |
| 2010-2011 | Process Control for Low-Cost Electrochromic Film on Plastic ITN Energy Systems/DOE. |
| 2009-2012 | CPS : Medium : Cyber-Enabled Efficient Energy Management of Structures (CEEMS) NSF. |
| 2008-2010 | Renewable and Logistics Fuels for Fuel Cells at the Colorado School of Mines Department of Energy. |
| 2007 | Tracking Support for Loadmaster Training System Pathfinder System Inc. |
| 2006-2007 | Scalable Effusion Sources for CIGS Photovoltaics Manufacturing, ITN Energy Systems. |
| 2006-2008 | Video Aided Navigation, Perceptek Inc. |
| 2005-2006 | Dismounted Augmented Reality Training System, Pathfinder Systems Inc. |
| 2005-2006 | Architecture for Subsystem Fault Detection in Networked Sensors, ITN Energy Systems. |
| 2002-2007 | CAREER: Model Free Fault Detection for Nonlinear Systems, National Science Foundation. |
| 2002-2004 | Model Based Control of PV Manufacturing Processes, ITN Energy Systems. |
| 2001-2002 | Sonic Tag Tracking System, Alaska Pacific University (subcontract on NSF-MRI). |
| 2001-2002 | Control System for CIGS Chambers, ITN Energy Systems. |
| 2001-2003 | Major Research Instrumentation: Acquisition of Instrumentation for Vision Based Control of Welding and Droplet Manufacturing Processes, National Science Foundation. |
| 1999-2002 | A Novel Manufacturing Process for Transparent Conducting Oxide Thin Films, National Science Foundation. |
| 1999-2000 | Control of an Actuated Vision Sensor, PI, Colorado Advanced Software Institute. |

PROFESSIONAL SERVICE

| | |
|---|------------------|
| Program Committee, American Controls Conference | 2001, 2002, 2004 |
| Vice Chair for Industry and Applications, American Controls Conference | 2003 |
| Corresponding Editor, IEEE Control Systems Magazine | 2006 2009 |
| Organizer of special session on experiment design in nonlinear system identification, ACC | 2007 |
| Organizer of special session on compressive sensing and identification, CDC | 2010 |
| Program Committee, Conference on Control Applications | 2011 and 2012 |

Reviewer: IEEE Transactions on Automatic Control
 Reviewer: IEEE Transactions on Control Systems Technology
 Reviewer: IEEE Transactions on Semiconductor Manufacturing

Reviewer: IEEE Transactions on Automation Science and Engineering
Reivewer: IEEE Transactions on Signal Processing
Reviewer: Automatica
Reviewer: Journal of Guidance, Control, and Dynamics
Reviewer: International Journal of Robotics Research
Reviewer: Machine Vision and Applications Journal
National Science Foundation Panel Reviewer 2009, 2010, 2011

BOOK CHAPTERS

1. Robert J. Kee, Huayang Zhu, Robert J. Braun, and Tyrone L. Vincent Modeling the Steady-State and Dynamic Characteristics of Solid-Oxide Fuel Cells. *Advances in Chemical Engineering* Vol. 41, 2012.
2. Robert J. Braun, Tyrone L. Vincent, Huayang Zhu, and Robert J. Kee, Analysis, Optimization and Control of Solid-Oxide Fuel Cell Systems, *Advances in Chemical Engineering* Vol. 41, 2012.

JOURNAL PUBLICATIONS

1. B. M. Sanandaji, T. L. Vincent, and M. B. Wakin, Concentration of measure inequalities for Toeplitz matrices with applications, *IEEE Transactions on Signal Processing*, Vol. 61, No. 1, pp. 109-117, 2013.
2. Farshad Harirchi, Tyrone L. Vincent, Anand Subramanian, Kameshwar Poolla and Broc Stirton, Implementation of Nonthreaded Estimation for Run-to-Run Control of High Mix Semiconductor Manufacturing, *IEEE Trans. Semiconductor Manufacturing*, Vol. 26, No. 4, pp. 516-528, 2013.
3. T. L. Vincent and C. Novara, Mixed parametric/non-parametric identification of systems with discontinuous nonlinearities, *Automatica*, Vol. 49, No. 12, pp. 3661- 3669, 2013.
4. Kwang-Kyo Oh, Fadel Lashhab, Kevin L. Moore, Tyrone L. Vincent and Hyo- Sung Ahn, Consensus of positive real systems cascaded with a single integrator, *International Journal of Robust and Nonlinear Control*, DOI: 10.1002/rnc.3093, 2013.
5. Matthew J. Kupilik and Tyrone L. Vincent, Control of a Solid Oxide Fuel Cell System with Sensitivity to Carbon Formation, *Journal of Power Sources*, <http://dx.doi.org/10.1016/j.jpowsour.2012.08.083>, 2012
6. Tyrone L. Vincent, Broc James Stirton and Kameshwar Poolla, Metrology Sampling Strategies for Process Monitoring Applications, *IEEE Transactions on Semiconductor Manufacturing*, Vol. 24, No. 4, pp. 489-498, 2011.
7. Carlo Novara, Tyrone Vincent, Kenneth Hsu, Mario Milanese and Kameshwar Poolla, Parametric identification of structured nonlinear systems, *Automatica*, vol. 47, pp. 711-721, 2011.
8. Tyrone L. Vincent, Carlo Novara, Kenneth Hsu, and Kameshwar Poolla, Input Design for Structured Nonlinear System Identification, *Automatica*, vol. 46, no. 6, pp. 990-998, 2010.
9. A M. Colclasure, B. M. Sanandaji, T. L. Vincent, R. J. Kee, Modeling and control of tubular solid-oxide fuel cell systems: I. Physical models and linear model reduction, *Journal of Power Sources*, 2010, doi:10.1016/j.jpowsour.2010.06.074
10. B. M. Sanandaji, T. L. Vincent, A M. Colclasure, R. J. Kee, Modeling and control of tubular solid-oxide fuel cell systems: II. Nonlinear model reduction and model predictive control, *Journal of Power Sources*, 2010, doi:10.1016/j.jpowsour.2010.06.075
11. Guther Schwab, John P. H. Steele, and Tyrone L. Vincent, Vision Based Spatter Classification for Contaminant Detection *AWS Journal*, Vol. 88, pp. 121s-130s, 2009.
12. Kenneth Hsu, Kameshwar Poolla, and Tyrone L. Vincent Identification of Structured Nonlinear Systems, *IEEE Transactions on Automatic Control* Vol. 53, No. 11, pp. 2497-2513, 2008.

13. Kenneth Hsu, Tyrone Vincent, Greg Wolodkin, Sundeep Rangan, and Kameshwar Poola An LFT Approach to Parameter Estimation, —em Automatica Vol. 44, No. 12, pp. 3087-3092, 2008.
14. Josh Erramouspe, Panos D. Kiouisis, Richard Christenson, and Tyrone Vincent, A Resetting Stiffness Dynamic Controller and its Bench Scale Implementation, *Engineering Structures*, vol. 29, no. 10, pp. 2602-2610, 2007.
15. Mark T. Lusk, Tyrone Vincent, and Moneesh Upmanyu, Steering of a Grain Boundary with Strain, Electromagnetic Field, and Stochastic Boundary Excitation, *Journal of Applied Physics*, Vol. 100, 103526, 2006.
16. Kenneth Hsu, Carlo Novara, Tyrone Vincent, Mario Milanese, Kameshwar Poola, Parametric and Nonparametric Curve Fitting *Automatica* Vol. 42 No. 11, pp. 1869-1873, 2006.
17. Matthew J. Hilt, Tyrone L. Vincent, Bharat S. Joshi and Lin J. Simpson, Estimating relative deposition in a multi-zone process using a single composition sensor, *IEEE Transactions on Control Systems Technology*, Vol. 14, No. 2, pp. 247-259, 2006.
18. Mark T. Lusk, Moneesh Upmanyu, and Tyrone Vincent, Targeted manipulation of grain boundaries and triple junctions on thin films using lasers: A Potts model simulation, *Journal of Applied Physics*, Vol. 99, 023505, 2006.
19. John P.H. Steele, Chris Mnich, Chris Debrunner, Tyrone Vincent, and Stephen Liu, Development of closed-loop control of robotic welding processes, *Industrial Robot: An International Journal*, Vol. 32, No. 4, pp. 350-355, 2005.
20. Tyrone L. Vincent and Laxminaryan L. Raja, Optimal Pulse Shaping for Plasma Processing, *IEEE Transactions on Control Systems Technology*, Vol. 12, No. 1, 2004.
21. M. Whitehorn, T. Vincent, C. H. Debrunner and J. Steele, Stereo Vision in LHD Automation, *IEEE/IAS Transactions on Industry Applications*, Vol. 39, No. 1, pp. 21 -29, 2003.
22. Tyrone L. Vincent and Laxminaryan L. Raja, A Novel Approach for Control of High-density Plasma Reactors through Optimal Pulse Shaping, *Journal of Vacuum Science and Technology A*, Vol. 20, No. 5, pp.1722-1732, 2002.
23. Lin Chai, William A. Hoff and Tyrone L. Vincent, 3-D motion and structure estimation using inertial sensors and computer vision for augmented reality, *Presence: Teleoperators and Virtual Environments*, October, 2002.
24. I.L. Eisgruber, B. Joshi, N. Gomez, J. Britt, T. Vincent, In-situ x-ray fluorescence used for real-time control of CUINxGA1-x SE2 thin film composition, *Thin Solid Films*, vol. 408, pp. 64-72, 2002.
25. J. J. Robbins, R. T. Alexander, W. Xiao, T. L. Vincent and C. A. Wolden, An investigation of tin oxide plasma-enhanced chemical vapor deposition using optical emission spectroscopy, *Thin Solid Films*, vol. 406, pp. 145-150, 2002.
26. Joshua J. Robbins, Robert T. Alexander, Mailasu Bai, Yen-Jung Huang, Tyrone L. Vincent, and Colin A. Wolden, Development of tin oxide synthesis by plasma-enhanced chemical vapor deposition, *Journal of Vacuum Science Technology A*, Nov/Dec, 2001.
27. W. A. Hoff and T. L. Vincent, Analysis of Head Pose Accuracy in Augmented Reality, *IEEE Transactions on Visualization and Computer Graphics*, Vol 6., No. 4, 2000.
28. T. L. Vincent and P. P. Khargonekar, A Class of Nonlinear Filtering Problems arising from Drifting Sensor Gains, *IEEE Transactions on Automatic Control*, vol. 44, no. 3, pp. 509-520, 1999.
29. C. Galarza, P. Khargonekar, N. Layadi, T. Vincent, E. Rietman and J. Lee, A new algorithm for real-time thin film thickness estimation given in situ multiwavelength ellipsometry using an extended Kalman filter, *Thin Solid Films*, vol. 313-314, no. 1-2, pp. 156-160, February, 1998.
30. M. Sarfaty, C. Baum, R. Breun, N. Hershkowitz, J. L. Shohet, K. Nagpal, T. Vincent, P. P. Khargonekar, "Real-time measurement of thin film thickness during processing," *Plasmas and Polymers*, vol. 2, no. 4, pp. 229-244, 1997.

31. T. L. Vincent, P. P. Khargonekar and F. L. Terry, Jr., End Point and Etch Rate Control Using Dual-Wavelength Laser Reflectometry with a Nonlinear Estimator, *Journal of the Electrochemical Society*, vol. 144, no. 7, pp. 2467-2472, 1997.
32. M. Hankinson, T. Vincent, K. Irani, and P. Khargonekar, Combined real-time and run-to-run control of etch depth and spatial uniformity in plasma etching, *Journal of the Electrochemical Society*, vol. 144, no. 7, pp. 2473-2479, 1997.
33. T. L. Vincent, P. P. Khargonekar and F. L. Terry, Jr., An Extended Kalman Filtering based method of processing reflectometry data for fast in-situ etch rate measurements, *IEEE Transactions on Semiconductor Manufacturing*, vol. 10, no. 1, pp. 42-51, 1997.
34. M. Hankinson, T. Vincent, K. Irani, and P. Khargonekar, Integrated real-time and run-to-run control of etch depth in reactive ion etching, *IEEE Transactions on Semiconductor Manufacturing*, vol. 10, no. 1, pp. 121-130, 1997.
35. M. J. Buie, J. T. P. Pender, J. P. Holloway, T. Vincent, P. L. G. Ventzek, and M. L. Brake, Abel's inversion applied to experimental spectroscopic data with off axis peaks, *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 55, no. 2, pp. 231-43, 1996.
36. J. Pender, M. Buie, T. Vincent, J. Holloway, M. Elta, M. L. Brake, Radial optical emission profiles of radio frequency glow discharges, *Journal of Applied Physics*, vol. 74, no. 5, pp. 3590-3597, 1993.

CONFERENCE PUBLICATIONS

1. Farshad Harirchi, Tyrone L. Vincent, Anand Subramanian, Kameshwar Poolla, Broc Stirton, Characterizing and Resolving Unobservability in Run-To-Run Control of High Mix Semiconductor Manufacturing, in: Proc. Conference on Decision and Control, Florence, Italy, December 10-13, 2013
2. He Hao, Borhan M. Sanandaji, Kameswhar Poolla and Tyrone L. Vincent A Generalized Battery Model of a Collection of Thermostatically Controlled Loads for Providing Ancillary Service, in Proc. Allerton Conference on Communication, Control and Computing, Urbana-Champaign, IL, October 2-4, 2013.
3. Ali Al-Matouq, Tyrone L. Vincent, and Luis Tenorio, Reduced Complexity Dynamic Programming Solution for Kalman Filtering of Linear Discrete Time Descriptor Systems, in: Proc. American Control Conference, Washington DC, June 17-19, 2013.
4. Tyrone L. Vincent and Carlo Novara, Mixed Parametric/Non-Parametric Identification of Systems with Discontinuous Nonlinearities, in: Proc. American Control Conference, Washington DC, June 17-19, 2013.
5. Borhan Molazem Sanandaji, Tyrone L. Vincent, Kameshwar Poolla and Michael B. Wakin, A tutorial on recovery conditions for compressive system identification of sparse channels, in: Proc. 51st Conference on Decision and Control, Maui, 2012.
6. Borhan Molazem Sanandaji, Tyrone Vincent and Michael Wakin, A review of Sufficient Conditions for Structure Identification in Interconnected Systems in: Proc. 16th IFAC Symposium on System Identification (SYSID), Brussels, Belgium, 2012.
7. Borhan Molazem Sanandaji, Tyrone L. Vincent, Michael Wakin, Roland Tth, Kameshwar Poolla, Compressive System Identification of LTI and LTV ARX Models, in: Proc. Conference on Decision and Control, 2011.
8. Roland Tth, Borhan Molazem Sanandaji, Kameshwar Poolla, and Tyrone L. Vincent, Compressive System Identification in the Linear Time-Invariant Framework, in: Proc. Conference on Decision and Control, 2011.
9. Borhan M. Sanandaji, Tyrone L. Vincent and Michael B. Wakin, Compressive Topology Identification of Interconnected Dynamic Systems via Clustered Orthogonal Matching Pursuit, in: Proc. Conference on Decision and Control, 2011.
10. Kevin L. Moore, Tyrone L Vincent, Fadel Lashhab and Chang Liu, Dynamic Consensus Networks with Application to the Analysis of Building Thermal Processes, in: Proc. IFAC World Congress, Milan, Italy, pp. 3078-3083, 2011

11. Matthew J. Kupilik and Tyrone L. Vincent , “Estimation of Biogas Composition in a Catalytic Reactor via an Extended Kalman Filter, in: Proc. Multi-Conference on Decision and Control, Denver CO, September 28-30, pp. 268-773 2011.
12. Borhan M. Sanandaji, Tyrone L. Vincent and Michael B. Wakin, Exact Topology Identification of Large-Scale Interconnected Dynamic Systems from Compressive Observations, in: Proc. American Control Conference, June 29 to July 1, San Fransisco, CA, pp. 649-656, 2011.
13. Borhan M. Sanandaji, Tyrone L. Vincent and Michael B. Wakin, Concentration of Measure Inequalities for Compressive Toeplitz Matrices with Applications to Detection and System Identification, in: Proc. Conference on Decision and Control, Atlanta Georgia, 2010.
14. Michael B. Wakin, Borhan M. Sanandaji and Tyrone L. Vincent, On the Observability of Linear Systems from Random, Compressive Measurements, in: Proc. Conference on Decision and Control, Atlanta Georgia, 2010.
15. Borhan M. Sanandaji, Tyrone L. Vincent, Andrew Colclasure, and Robert J. Kee, Control-Oriented Modeling of a Solid-Oxide Fuel Cell Stack Using an LPV Model Structure, in: Proc. ASME Dynamic Systems and Control Conference, Hollywood, CA, DSCC2009-2614, 2009.
16. Tyrone Vincent, Borhan Sanandaji, Andrew Colclasure, Huayang Zhu, and Robert J. Kee, ”Physically Based Model-Predictive Control for SOFC Stacks and Systems”, ECS Trans. 25, 1175, 2009, doi:10.1149/1.3205646
17. Tyrone L. Vincent, Carlo Novara, Kenneth Hsu and Kameshwar Poolla, Input Design for Structured Nonlinear System Identification, in: Proc. IFAC Conference on System Identification St. Malo, France, 2009
18. Carlo Novara, Tyrone L. Vincent and Kameshwar Poolla, Implementation of Input Design for Structured Nonlinear System Identification, in: Proc. IFAC Conference on System Identification St. Malo, France, 2009.
19. Kenneth Hsu, Tyrone L. Vincent and Kameshwar Poolla, ”Nonparametric Methods for the Identification of Linear Parameter Varying Systems,” in: Proc. Multi-conference on Systems and Control, San Antonio, TX, 2008.
20. Gunther Schwab, Tyrone L. Vincent and John P. H. Steele, Contaminant Classification in Robotic Gas Metal Arc Welding via Image Based Spatter Tracking, in: Proc. Multi-conference on Systems and Control, San Antonio, TX, 2008.
21. John Steinbis, William Hoff, and Tyrone L. Vincent, 3D Fiducials for Scalable AR Visual Tracking in: Proc. 7th IEEE and ACM International Symposium on Mixed and Augmented Reality, Cambridge, UK, 2008.
22. John Steinbis, William Hoff, and Tyrone Vincent, New Extensions of the 3-Simplex for Exterior Orientation in: Proc. International Conference on Pattern Recognition, Tampa Florida, 2008.
23. Gunther Schwab, John Steele and Tyrone Vincent, Automatic Detection and Identification of Contaminants during Welding, American Welding Society Professional Program, Chicago, IL., Nov 11-14 2007.
24. Kenneth Hsu, Tyrone Vincent and Kameshwar Poolla, Experiment Design for Structured Nonlinear System Identification, in: Proc. American Control Conference, New York, July 11-13, 2007.
25. Kenneth Hsu, Tyrone Vincent and Kameshwar Poolla, ”Robust Structured Nonlinear System Identification” in: Proc. 45th Conference on Decision and Control, San Diego, CA, Dec 13-15, pp. 2518-2522, 2006.
26. Renee Spinhirne and Tyrone L. Vincent, Experiment Design for Ratio Estimates, in: Proc. American Control Conference, Minneapolis, MN, 2006.
27. Kenneth Hsu, Tyrone Vincent and Kameshwar Poolla, ”A Kernel Based Approach to Structured Nonlinear System Identification Part I: Algorithms” in: Proc. SYSID’06, Newcastle Australia, March 29-31, pp. 1198-1203, 2006.

28. Kenneth Hsu, Tyrone Vincent and Kameshwar Poola, "A Kernel Based Approach to Structured Nonlinear System Identification Part II: Convergence and Consistency" in: Proc. SYSID'06, Newcastle Australia, March 29-31, pp. 1204-1209, 2006.
29. Kenneth Hsu, Tyrone Vincent, Carlo Novara, Mario Milanese, Kameshwar Poola, Identification of Nonlinear Maps in Interconnected Systems, in: Proc Conference on Decision and Control, December 12-15, Seville, Spain, 2005.
30. Matthew J. Hilt, Tyrone L. Vincent, Bharat S. Joshi and Lin J. Simpson, Estimating relative deposition rates in a multi-source continuous-deposition process using a single composition sensor, in: Proc. American Control Conference, June 8-10, Portland, OR, 2005.
31. Tyrone L. Vincent, Square Root Algorithms for Robust Fault-Detection of Linear Descriptor Systems, presented at Workshop on Advanced Control and Diagnosis, Karlsruhe, Germany, November 17-18, 2004.
32. Renee M. Spinhirne and Tyrone L. Vincent, On Fault Detection Using Dynamic PCA with Varying Input Excitation, presented at Workshop on Advanced Control and Diagnosis, Karlsruhe, Germany, November 17-18, 2004.
33. C. Mnich, F. Al-Bayat, C. Debrunner, J. P. H. Steele, and T. L. Vincent, "In situ weld pool measurement using stereovision," presented at Japan USA Symposium on Flexible Automation, Denver, Colorado, 2004.
34. T. L. Vincent and T. Fretheim, Fault detection of nonlinear dynamic systems with empirical input/output models, in: Proc. SAFEPROCESS, Washington DC, June 9-11, pp. 381-386, 2003.
35. Tyrone L. Vincent and Laxminarayan L. Raja, Theory of Optimal Pulse Shaping for Plasma Processing in: Proc. American Control Conference, Anchorage, AK, May 8-10, pp. 5119-5124, 2002.
36. M. Whitehorn, T. Vincent, C. Debrunner, J. Steele, Stereo vision in LHD automation, in: Conference Record - IAS Annual Meeting, Chicago, IL, Sep 30-Oct 4, pp. 1388-1395, 2001.
37. Tor Fretheim, Tyrone L. Vincent, and Rhamat Shoureshi, Optimization based fault detection for nonlinear systems, in: Proc. American Control Conference, Arlington, VA, June 25-27, pp. 1747-1752, 2001
38. Tor Fretheim, Rahmat Shoureshi, Tyrone Vincent, Duane Torgerson and John Work, Machine Diagnostics Using Nonlinear Output Observer and Neural Network Models, in: Proceedings of the ASME, Dynamic Systems and Control Division DSC-Vol. 69-1, pp. 371, 2000.
39. Tor Fretheim, Rahmat Shoureshi, Tyrone Vincent, Duane Torgerson and John Work, A General Approach to Non-Linear Output Observer Design Using Neural Network Models, in: Proc. American Control Conference, Chicago, June 28-30, 2000.
40. John P. H. Steele, Chris Debrunner, Tyrone Vincent, and Mark Whitehorn, Robotics for Underground Hardrock Mining: What have we got so far, where do we go from here. in: Proc. 2000 SME Annual Meeting, Salt Lake City, Utah, February 28 March 1, 2000.
41. Joshua Robbins, Tyrone Vincent, and Colin A. Wolden, Plasma-enhanced Chemical Vapor Deposition of Tin Oxide Thin Films, ", in: Proceedings of the 2000 NSF Design and Manufacturing Research Conference (Society of Manufacturing Engineers, 2000) CD-ROM .
42. Lin Chai, Khoi Nguyen, Bill Hoff and Tyrone Vincent, An Adaptive Estimator for Registration in Augmented Reality, in: Proc: 2nd Int. Workshop on Augmented Reality, pp.23-32, San Francisco, CA, October 20-21, 1999.
43. Tyrone. L. Vincent and Pramod. P. Khargonekar, A class of nonlinear filtering problems arising from drifting sensor gains, in: Proc. American Control Conference, pp. 2732-2736, Philadelphia, PA, June 24-26, 1998.
44. Tyrone Vincent, Cecilia Galarza, and Pramod P. Khargonekar, "Adaptive estimation using multiple models and neural networks," in: Proc. 7th IFAC Symposium on Artificial Intelligence in Real-Time Control, Grand Canyon, AZ, October 5-8, 1998.

45. T. L. Vincent, P. P. Khargonekar and F. L. Terry, Jr., Real time estimation and feedback control of etch rate and etch depth using nonlinear filtering techniques, in: Abstracts volume for 190th Electrochemical Society Meeting, San Antonio, TX, October 6-11, p. 375, 1996.
46. M. Hankinson, T. Vincent, K. Irani, and P. Khargonekar, Control of etch depth and spatial uniformity in reactive ion etching with integrated real-time and run-to-run control, in: Abstracts volume for 190th Electrochemical Society Meeting, San Antonio, TX, October 6-11, p. 1173, 1996.
47. T. L. Vincent, J. Abedor, K. Nagpal, and P. P. Khargonekar, Discrete-time estimators with guaranteed peak-to-peak performance, in: Proceedings of the 13th International Federation of Automatic Control World Congress, San Francisco, CA, Volume J, pp. 43-48, 1996.
48. M. Sarfaty, R. Breun, N. Hershkowitz, C. Baum, K. Nagpal, T. Vincent, P. P. Khargonekar, Real time control of etch rate and selectivity using two color laser interferometry, in: Proceedings of the 1996 IEEE International Conference on Plasma Science, Boston, MA., p. 281, 1996.
49. T. L. Vincent, P. P. Khargonekar, and F. L. Terry, Jr., An Extended Kalman Filter based method for fast in-situ etch rate measurements, in: Diagnostic Techniques for Semiconductor Materials Processing II (eds. S.W. Pang, et al.), Symposium held November 27-30, 1995 Boston, MA, pp. 87-94, Materials Research Society, Pittsburgh, PA, 1996.
50. T. L. Vincent, P. P. Khargonekar, and F. L. Terry, Jr., A real-time etch rate estimation algorithm for single/multiple wavelength reflectometry, in: Proceedings of SEMATECH AEC/APL Workshop VII, pp. 347-366, November 1995.
51. J. Durham, V. J. Marcos, T. Vincent, J. Martinez, S. Shelton, G. Fortner, M. Clayton, S. Felker, Automation and statistical process control of a single wafer etcher in a manufacturing environment, in: IEEE/SEMI 1995 Advanced Semiconductor Manufacturing Conference and Workshop, pp. 213-215, 1995.
52. M. Hankinson, T. Vincent, K. Irani, and P. Khargonekar, Combined real-time and run to run control of etch depth in reactive ion etching, in: Proceedings of SEMATECH AEC/APL Workshop VII, pp. 249-269, November 1995.
53. T. L. Vincent, P. P. Khargonekar, B. A. Rashap, F. Terry, and M. Elta, Nonlinear system identification and control of a reactive ion etcher, in: Proceedings of the 1994 American Control Conference, Baltimore, MD, pp. 902-905, 1994.
54. M. E. Elta, J. P. Fournier, J. S. Freudenberg, M. D. Giles, J. W. Grizzle, P. P. Khargonekar, B. A. Rashap, Fred L. Terry, Jr., and T. Vincent, Real-time feedback control of reactive ion etching, in: Proceedings of SPIE, vol. 2091, pp. 438-451, 1994.
55. M. J. Buie, J. T. Pender, T. Vincent, J. Holloway, M. L. Brake, and M. E. Elta, Optical emission spectroscopy on the GEC reference cell, in: Proceedings of SPIE, vol. 2091, pp. 211-217, 1994.
56. Thomas L. Vincent, Thomas J. Schmitt, and Tyrone L. Vincent, A chaotic controller for the double pendulum, in: Mechanics and Control: Proceedings of the 5th Workshop on Control Mechanics, pp. 257-273, 1994.

CURRENT GRADUATE STUDENTS

| | |
|----------------------|--|
| Hossein Sartipizadeh | Ph.D. student Thesis topic: Control of Fuel Processing Systems |
| Rammah Abohtyra | Ph.D. student Thesis topic: Networked system identification and controllability |
| Farshad Harirchi | Ph.D. student Thesis topic: Estimation of High-Mix Semiconductor Manufacturing processes |
| Ali Al-Matouq | PhD. Student Thesis topic: Moving Horizon Estimation for Descriptor Systems |

GRADUATE STUDENT THESIS

| | |
|------------------|--|
| Borhan Sanandaji | Compressive System Identification (CSI): Theory And Applications Of Exploiting Sparsity In The Analysis Of High-Dimensional Dynamical Systems, Ph.D. in Electrical Engineering, 2012. (co-advisor with Mike Wakin) |
| Matt Kupilik | Control Of Balance Of Plant Components For Solid Oxide Fuel Cell Systems With Sensitivity To Carbon Formation, Ph.D in Electrical Engineering, 2012. |
| Chaing Liu | Model Predictive Optimal Control For Active And Passive Cold Thermal Energy Storage Of Multi-Zone Buildings, M.S. in Engineering Systems, 2011. (co-advisor with Kevin Moore) |
| Maciej Zagdrozki | Control of Sputter Deposition of Tungsten Oxide using Optical Emission Spectroscopy, M.S. in Engineering Systems, 2011. |
| Matt Kupilik | Analysis Of Scale Factor Estimation and Propagation in Monocular Vision-Based Navigation M.S. in Engineering Systems, 2008. |
| Gunther Schwab | Spatter Detection And Contaminant Classification In Robotic Gas Metal Arc Welding, Ph.D. in Engineering Systems, 2008. |
| John Steinbis | A New Vision and Inertial Pose Estimation System For Handheld Augmented Reality : Design, Implementation & Testing, M.S. in Engineering-Electrical, 2008. |
| Renee Spinhirne | Managing the Effects of Input Excitation on Model-Based Fault Detection, Ph.D. in Engineering Systems, 2007. |
| Matt Hilt | Validation and Reduction of Models for High-Rate Metal-Vapor Effusion Sources, M.S. in Engineering Systems, 2004. |
| Adam Krier | Langmuir Probe Measurements of an Inductively Coupled Plasma Reactor with Arbitrary Power Supply Modulation, M.S. in Engineering Systems, 2002. |
| Renee Spinhirne | The Use of State Estimation Uncertainty as a Criterion for Navigation, co-advisor, M.S. in Computer Science, 2002. |
| Xinwei Luo | Automatic Control of CIGS Deposition, M.S. in Engineering Systems, 2002. |
| Weican Xiao | In-Situ Optical Diagnostics of Tin Oxide Thin Film Synthesis Using Plasma Enhanced Chemical Vapor Deposition, M.S. in Engineering Systems, 2002. |
| Tormod Fretheim | Fault Detection and Non-Linear Output Observer Design Using Neural Network Models, co-advisor, Ph.D. in Engineering Systems, 2001. |
| Joshua Robbins | Plasma Enhanced Chemical Vapor Deposition and Physical Characterization of Tin Oxide Thin Films, co-advisor, M.S. in Chemical Engineering, 2000. |
| Lin Chai | 3-D Motion and Structure Estimation Using Inertial Sensors and Computer Vision for Augmented Reality, co-advisor, M.S. in Engineering Systems, 2000. |

INVITED TALKS

1. University of California at Berkeley, Applications of Estimation in Thin Film Processing Invited seminar talk given at , October 22nd., 1999.
2. Small Lots Intelligent Manufacturing Workshop, sponsored by Los Alamos National Laboratory, Santa Fe, September 2-3, 2003
3. University of California, Berkeley, Applications of Systems Theory in Thin Film Processing February 4, 2005.
4. University of California, Los Angeles, Input design for ratio estimates, with application to thin film processing March 4, 2005.

5. University of California, Santa Cruz, Input design for ratio estimates, with application to thin film processing May 2, 2005.
6. Polytechnico di Torino, Italy, Identification of Interconnected Systems July 2, 2009.
7. University of Kyoto, Japan Identification of Interconnected Systems, July 13, 2010
8. University of Osaka, Japan Identification of Interconnected Systems, July 26, 2010
9. Kieo University, Japan Compressive Signal Processing for System Estimation and Identification, July 30, 2010
10. Tokyo Institute of Technology, Japan Identification of Interconnected Systems, August 3, 2010.
11. Technical University of Eindhoven, the Netherlands The Use of Sparsity Models in System Identification and Estimation, October 18th, 2012.
12. Polytechnic University of Turin, Italy The Use of Sparsity Models in System Identification and Estimation, November 21st, 2012.
13. University of Siena, Italy The Use of Sparsity Models in System Identification and Estimation, November 23rd, 2012.
14. Polytechnic University of Milan, Italy The Use of Sparsity Models in System Identification and Estimation, November 29th, 2012.

TEACHING

Undergraduate Level:

EGGN/EENG 307/407
 EGGN 388
 EGGN 487
 EGGN/EENG 417

Introduction to Feedback Control
 Information Systems Science
 Engineering Control Laboratory
 Modern Control System Design

Graduate Level:

EGES 523
 EGGN 515
 EGGN/EENG 519
 EGES 618
 EGES 598
 EGES 598
 EGGN504

Design of Digital Control Systems
 Advanced Linear Systems Theory
 Estimation Theory and Kalman Filtering
 System Identification and Adaptive Control
 Digital Control Laboratory
 Computer Vision and Robotics Seminar
 Sensing, Communication and Control Seminar

CSM SERVICE

| | |
|---|---|
| <p>1998-1999 1999-2000 2001-2002 2001-2002 2002-2003 2006-2007 2007-2008 2005-2008 2005-2008 2008-2012 2013-2014 1999-2005</p> | <p>Search Committee, Power Electronics Position, Division of Engineering Search Committee, EE Position, Division of Engineering Search Committee, Power Position, Division of Engineering Search Committee, Paden Chair Chair, Search Committee, EE Telecommunications Position. Chair, EE search Committee Chair, EE search Committee Faculty Senate Chair, Faculty Affairs Committee Chair, EECS Undergraduate Curriculum Committee Chair, EECS Planning Committee Coordinator for Engineering Physics/Engineering 5 year BS/MS program (EE specialty)</p> |
|---|---|