

MATTHEW A. FRANCKEK

Abbreviated Curriculum Vitae

University of Houston

Department of Mechanical Engineering

N207 Engineering Building 1

Houston, Texas 77204-4006

March 2008

EDUCATION

December 1991	Doctorate of Philosophy in Mechanical Engineering Texas A&M University <i>Advisor: S. Jayasuriya</i>
December 1988	Master of Science in Mechanical Engineering Texas A&M University <i>Advisor: S. Jayasuriya</i>
May 1987	Bachelor of Science in Mechanical Engineering University of Texas at Arlington
May 1984	Associate in Arts and Science Eastfield College

PROFESSIONAL EXPERIENCES

August 2002 -Present	PROFESSOR and CHAIR University of Houston Department of Mechanical Engineering
August 2002 -Present	DIRECTOR University of Houston Biomedical Engineering Program
July 2001 -August 2002	PROFESSOR Purdue University School of Mechanical Engineering
July 1997 -July 2001	ASSOCIATE PROFESSOR Purdue University School of Mechanical Engineering
June 1997 -August 2002	DEPUTY DIRECTOR Purdue University Electro-Hydraulic Control Research Center
January 1992 -July 1997	ASSISTANT PROFESSOR Purdue University School of Mechanical Engineering
May 1981 -August 2002	CONSULTING ENGINEER Control system design and implementation, mechatronics, hydraulic system design, and machine design (mainframes and powertrain).

PROFESSIONAL SOCIETIES

American Society of Mechanical Engineering
 Dynamic Systems and Control Division
 Society of Automotive Engineers
 Institute of Electrical and Electronics Engineers
 Engineering In Training Certified in 1987 (Texas)

PROFESSIONAL ACTIVITIES

- Reviewer for:
 - National Science Foundation, Dynamic Systems and Control Division
 - ASME Journal of Dynamic Systems, Measurement and Control
 - ASME Journal of Vibration and Acoustics
 - Journal of Sound and Vibration
 - International Journal of Robust and Nonlinear Control
 - International Journal of Control
 - Acoustical Society of America
 - Journal of Vibration and Control
 - Numerous Conference Proceedings sponsored by ASME, IEEE, and AIAA
- Associate Editor, ASME Journal of Dynamic Systems, Measurement and Control, 2002-Present.
- Member of the Technology Executive Conference, American Society of Mechanical Engineers, March 7-9, 2008.
- Executive Committee Member, Dynamic Systems and Control Division, American Society of Mechanical Engineers, 2005-Presented.
- Organizer, 2nd Workshop for the Alliance for NanoHealth, Featured Speakers included U. S. Representative Culberson, General Howell from NASA, and Dr. Richard Smalley (*Nobel Laureate* from Rice University), February 23, 2005.
- Member of the Technology Executive Conference, American Society of Mechanical Engineers, March 7-9, 2003.
- Member of the International Program Committee for International Association of Science and Technology for Development (IASTED), Intelligent Systems and Control, 2003.
- Invited Member, National Science Foundation Panel on Dynamic Systems Modeling, Anchorage, Alaska, 2002.
- Chair, Nonlinear Identification II, American Control Conference, Anchorage, Alaska, 2002.
- Co-Chair, Applications of Adaptive Control, American Control Conference, Anchorage, Alaska, 2002.
- Member of the 2002 American Control Conference Technical Program Committee

- Dynamic Systems and Control Division Representative to the 2001 International Mechanical Engineering Congress & Exposition, American Society of Mechanical Engineers
- Member of the 1999 American Control Conference Editorial Board
- ASME Dynamic Systems and Control Division (DSCD) Representative to the 1999 American Control Conference Organization Board
- Organizer, Historical Perspective, Landmark Results, and Future Research Directions in Nonlinear Control (2 sessions), ASME International Mechanical Engineering Congress and Expositions, 1998.
- Organizer, Historical Perspective, Landmark Results, and Future Research Directions in Robust Control (1 session), ASME International Mechanical Engineering Congress and Expositions, 1998.
- Organizer, Robust Control (1 session), ASME International Mechanical Engineering Congress and Expositions, 1998.
- Chair, Systems Theory Panel, Dynamics Systems, and Control Division, ASME, 1995-1998
- Vice-Chair, Systems Theory Panel, Dynamics Systems, and Control Division, ASME, 1994-1996
- Newsletter Editor for the Dynamic Systems, and Control Division ASME, 1988-1993
- Co-Chair, Symposium on Advanced Automotive Technologies: Diagnosis and Control for Automated Highway Systems, International Mechanical Engineering Congress and Exposition, Dallas, Texas, (1997).
- Chair, Hydraulic and Electro-Hydraulic-I, International Mechanical Engineering Congress and Exposition, Dallas, Texas, (1997).
- Chair, Design and Control of Smart Machines, International Mechanical Engineering Congress and Exposition, Dallas, Texas, (1997).
- Co-Chair, Symposium on Elasto-Impact and Friction in Dynamic Systems: Measurements and Control of Mechanical Systems, International Mechanical Engineering Congress and Exposition (1996)
- Co-Chair, Symposium on Robust Control and Estimation: Robust Control of Mechanical Systems, International Mechanical Engineering Congress and Exposition (1996)
- Co-Organized, Symposium on Nonlinear Dynamics and Control, International Mechanical Engineering Congress & Exposition (1996)
- Co-Organized, Robust Control Session, International Federation of Automatic Control (1996)
- Chair, Quantitative Feedback Theory I, International Federation of Automatic Control (1996)
- Chair, Quantitative Feedback Theory II, International Federation of Automatic Control (1996)
- Organizer and Chair, Symposium on Robust and Nonlinear Control: Robust Control-I, International Mechanical Engineering Congress and Exposition (1995)

- Organizer and Co-Chair, Symposium on Robust and Nonlinear Control: Robust Control--III, International Mechanical Engineering Congress and Exposition (1995)
- Chair, Quantitative Feedback Theory, American Control Conference (1995)
- Co-Organizer, Quantitative Feedback Theory Symposium (1995) Purdue University, West Lafayette, Indiana
- Co-Chair, Symposium on Control Theory and Methodology, ASME WAM (1994)
- Chair, Quantitative Feedback Theory, American Control Conference (1994)
- Co-Chair, Recent Developments in Robust Control Design, ASME WAM (1993)
- Co-Chair, Quantitative Feedback Theory, ASME WAM (1993)
- Co-Chair, Robust Controller Design Session, American Control Conference (1992)
- Publicity Chairman, QFT Symposium (1992)

AWARDS & RECOGNITIONS

1. **Rated Top 10 of the Most Downloaded Articles** within the ASME Journal of Dynamic Systems, Measurement and Control (denoted in the Journal publication section, 3 articles).
2. **Rated number 10 of 25 Hottest Articles** within Control Engineering Practice journal by ScienceDirect in 2005 (Ingram, G. A., Franchek, M. A., Balakrishnan, V., Surnilla, G., ``Robust SISO H-Infinity Controller Design for Nonlinear Systems, *Control Engineering Practice*, Vol. 13, Issue 11, pp. 1413-1423, 2005).
3. **Panel Member** for an external advisory committee on Systems Engineering for Dr. John Wall, Chief Technology Office at Cummins Incorporated, May 5, 2006.
4. **External Reviewer** for a Doctorate Examination, Greg Shaver, Stanford University, Department of Mechanical Engineering, May 6, 2005.
5. **Invited Participant** to the Seventh German-American Frontiers of Engineering Symposium sponsored by the *National Academy of Engineering* and the Alexander von Humboldt Foundation, April 29-May 1, 2004.
6. **Invited Participant** to the *Texas Academy of Scientist, Engineers and Physicians*, January 2004.
7. **2002 Best Paper Award by the ASME Journal of Dynamic Systems, Measurement and Control** for the paper entitled "*H_∞ Synthesis of Nonlinear Feedback Systems in a Volterra Representation*," Vol. 124, No. 3, pp. 382-389, 2002, *co-authored* with John Glass.
8. **2001 ASME Dynamic Systems and Control Division Young Investigator Award**, Citation: *For outstanding contributions to the art and science of controller design*,

particularly for controller synthesis in the frequency domain, sequential loop closure for multivariable systems, and nonlinear controller design, as applied to automotive engine control.

9. **1997 CASA/SME University Lead Award**, Society of Manufacturing Engineers and the Computer and Automated Systems Association of the SME, *In recognition of leadership and excellent in the application and development of enterprise-wide integrated manufacturing.*
10. **1997 Feddersen Faculty Fellow**, School of Mechanical Engineering, Purdue University, \$25,000.
11. **Harry L. Solberg Best Teacher Award**, School of Mechanical Engineering, Purdue University, 1994 and 1999.
12. **Citation for Excellence in Undergraduate Teaching**, School of Mechanical Engineering, Purdue University, (Rated as one of the top 10 teachers), Multiple Awards.
13. **1991 Outstanding Teaching Assistant Award**, Department of Mechanical Engineering, Texas A & M University

UNIVERSITY & SCHOOL SERVICE

University of Houston Service

1. **Member of a University of Houston-Methodist Hospital Workshop**, Initiated by Methodist, this workshop sought to establish processes, policies and implementation of a jointly supported biomedical engineering department. External speakers included Dr. Frank Yin (Washington University), Dr. Kenneth Lutchen (Boston University) and Dr. Yongmin Kim (University of Washington). Internal participants included R. Giroto (President and CEO, The Methodist Hospital), Dr. M. Lieberman (President, The Methodist Hospital Research Institute), Dr. D. Foss (UH Provost), and other faculty from UH and Methodist. Outcome: Move the UH Biomedical Program to a Department. March 15-16, 2006.
2. **Chair, Dean's Ad-hoc Committee on Faculty Quality Assessment**, Led the college review of the Faculty Quality Assessment Matrix proposed by the Provost in 2005. Outcomes included a modification of the Provost matrix as guided by the National Research Council criterion and the inclusion of teaching performance. October 2005-May 2006.
3. **University of Houston Representative to the Alliance for NanoHealth**, Provided leadership among UH, Rice, M.D. Anderson, University of Texas Medical Branch, University of Texas Health Science Center, and Baylor College of Medicine. Issues included partnership practices, research direction definition, and funding distribution. Fall May 2004-December 2005.
4. **University Committee on Establishing a Health Science Division**, Provost Chaired Committee, University of Houston. Fall 2004-Summer 2005.

5. **Member of Methodist Hospital/UH 30 Year MOU Team**, Led by Dr. A. Vailas (VP for Research at UH), I was responsible for reviewing the proposed multi-institutional partnership including the advisory committee composition, faculty governance, joint appointments and IP policies. Started in the summer of 2004 and signed in July of 2005.

Purdue University Service

1. **Undergraduate Curriculum Committee** and ABET accreditation, School of Mechanical Engineering, Purdue University, Fall 1993-1997.
2. **Mechanical Engineering Advisory Committee**, School of Mechanical Engineering, Purdue University, 1993-1995.
3. **Faculty Search Committees at Purdue University**
 - Combustion, Fall 1994-Spring 1995,
 - Systems Measurement and Control (SMAC), Fall 1994-Spring 1995,
 - Feddersen Chair of Mechanical Engineering, Fall 1998-2002,
 - Mechanical Systems, Fall 1997-Spring 1998
4. **Dean's Invitational for High School Teachers**, Purdue University, Fall 1995.
5. **Grievance Committee**, Purdue University, Fall 1995-Spring 1997, Chosen as a panelist on a 1997 grievance.
6. **Research Incentives Committee Meeting**, Engineering Representative Reporting to Professor Gary Isom, Spring 1999-Fall 1999.

COURSES TAUGHT AND STUDENT EVALUATIONS

Department of Mechanical Engineering Texas A&M University

Semester	Course Number	Course Title	Number of Students	Course Evaluation	Professor Evaluation
F87	ME 212	Engineering Mechanics, Statics	119	Evaluations not given	Evaluations not given
S88	ME 335	Mechanical Vibration and Feedback Control	21	Evaluations not given	Evaluations not given
S91	ME 335	Mechanical Vibration and Feedback Control	38	Evaluations not given	Evaluations not given
F91	ME 109	Introduction to Engineering	131	Evaluations not given	Evaluations not given
F91	ME 687	Special Topics, Multivariable Control <i>New Course Introduction</i>	14	Evaluations not given	Evaluations not given

School of Mechanical Engineering Purdue University

Semester	Course Number	Course Title	# of Students Responding/ # of Students in course	Course Evaluation	Professor Evaluation
S92	ME 375	Modeling and Analysis of Physical Systems	29/29	3.3/5.0	4.3/5.0
F92	ME 375	Modeling and Analysis of Physical Systems	86/86	3.5/5.0	4.4/5.0
S93	ME 475	Automatic Control Systems	60/60	3.8/5.9	4.5/5.0
F93	ME 575	Theory and Design of Control Systems <i>Restructured Course</i>	26/27	4.0/5.0	4.3/5.0
S94	ME 375	Modeling and Analysis of Physical Systems	48/48	3.7/5.0	4.3/5.0
F94	ME 575	Theory and Design of Control Systems	18/21	4.7/5.0	4.7/5.0
S95	ME 675	Multivariable Control Systems <i>Restructured Course</i>	13/13	4.8/5.0	4.8/5.0
F95	ME 575 (TV)	Theory and Design of Control Systems	14/14 (on campus)	Question not on evaluation	3.8/5.0
S96	ME 375	Modeling and Analysis of Physical Systems	29/31	3.4/5.0	3.4/5.0
F96	ME 375	Modeling and Analysis of Physical Systems	48/51	4.0/5.0	4.4/5.0
S97	ME 675	Multivariable Control Systems	12/13	4.8/5.0	4.8/5.0
F97	ME 6797F	Nonlinear Feedback Systems <i>New Course Introduction</i>	8/8	4.4/5.0	4.9/5.0
S98	ME 675 (TV)	Multivariable Control Systems		Evaluations not given	Evaluations not given
F98	ME 375	Modeling and Analysis of Physical Systems	53/66	3.9/5.0	4.6/5.0
S99	ME 375	Modeling and Analysis of Physical Systems	46/57	4.1/5.0	4.9/5.0
F99	ME 375	Modeling and Analysis of Physical Systems	57/69	4.2/5.0	4.8/5.0
S00	ME 675	Multivariable Control Systems	17/19	4.8/5.0	4.9/5.0
F00	ME 697F	Nonlinear Feedback Systems	5/7	4.2/5.0	4.2/5.0
S01	ME 463	Senior Design	24/25	4.7/5.0	4.9/5.0
F01	ME 375	Modeling and Analysis of Physical Systems	44/46	4.0/5.0	4.8/5.0

***Department of Mechanical Engineering
University of Houston***

Semester	Course Number	Course Title	Number of Students	Course Evaluation	Professor Evaluation
F03	BIOE 1197	Introduction to Biomedical Engineering <i>New Course Introduction</i>	15/17	3.79/4.0	3.97/4.0
S06	BIOE 3350	Biosensors II	10/10	<i>No Longer</i>	4.00/4.0

		<i>New Course Introduction</i>		<i>Available</i>	<i>Section Avg=3.25</i>
S07	BIOE 3350	Biosensors II	0/12	<i>Evaluations not given.</i>	<i>Evaluations not given.</i>

REFEREED ARCHIVAL PUBLICATIONS

1. Khalil, H. A., Kerr, D. T., Franchek, M. A., Metcalfe, R. W., Benkowski, R. J., Cohn, W. E., Tuzun, E., Radovancevic, B., Frazier, O. H., and Kadipasaoglu, K. A., "Continuous Flow Total Artificial Heart: Modeling and Feedback Control in a Mock Circulatory System," *American Society of Artificial Internal Organs*, (to appear).
2. Franco, J., Franchek, M. A., and Grigoriadis, K., "Real-Time Brake Torque Estimation for Internal Combustion Engines," *Mechanical Systems and Signal Processing*, Vol. 22, Issue 2, pp. 338-361, 2008.
3. Zhang, F., Grigoriadis, K. M., Franchek, M. A. and Makki, I. H., "Linear Parameter Varying Lean Burn Air-Fuel Ratio Control for a Spark Ignition Engine," *Journal of Dynamic Systems, Measurement and Control*, Vol. 129, Issue 4, pp. 404-414, 2007.
4. Cunningham, P. J., and Franchek, M. A., "An Instrumental Variable Method for Continuous-Time Transfer Function Model Identification With Application to Controller Auto-Tuning," *Journal of Dynamic Systems, Measurement and Control*, Vol. 129, Issue 2, pp. 154-162, 2007*.
5. Franchek, M. A., Buehler, P. J., and Makki, I., "Intake Air Path Diagnostics for Internal Combustion Engines," *Journal of Dynamic Systems, Measurement and Control*, Vol. 129, Issue 1, pp. 32-40, 2007*.
6. Osburn, A. W. and Franchek, M. A., "Reducing Engine Idle Speed Deviations Using the Internal Model Principle," *Journal of Dynamic Systems, Measurement and Control*, Vol. 128, No. 4, pp. 869-877, 2006.
7. Franchek, M. A., Mohrfeld, J., and Osburn, A. W., "Transient Fueling Controller Identification for Spark Ignition Engines," *Journal of Dynamic Systems, Measurement and Control*, Vol. 128, No. 3, pp. 499-509, 2006*.
8. Osburn, A. W., Kostek, T. M, and Franchek, M. A., "Residual Generation and Statistical Pattern Recognition for Engine Misfire Diagnostics," *Mechanical Systems and Signal Processing*, Vol. 20, Issue 8, pp. 2232-2258, 2006.
9. Buhr, C. A., Franchek, M. A., Fleeter, S., "Design of Control Law for Rotating Stall Subjected to Actuator Constraints," *AIAA Journal of Propulsion and Power*, Vol. 22, No. 1, pp.180-187, 2006.
10. Buhr, C. A., Franchek, M. A., Fleeter, S., "Rotating Stall Control in an Axial Compressor Subject to Wheel Speed Transients," *AIAA Journal of Propulsion and Power*, Vol. 22, No. 2, pp. 404-410, 2006.

* Rated as one of the Top 10 articles downloaded from the ASME DSC Journal Webpage.

11. Ingram, G. A., Franchek, M. A., Balakrishnan, V., Surnilla, G., ``Robust SISO H-Infinity Controller Design for Nonlinear Systems, *Control Engineering Practice*, Vol. 13, Issue 11, pp. 1413-1423, 2005. *Listed as one of the TOP 25 Hottest Articles by ScienceDirect, rated as 10 of 25.*
12. Geveci, M., Osburn, A. W., and Franchek, M. A., ``An Investigation of Crankshaft Oscillations for Cylinder Health Diagnostics,`` *Mechanical Systems and Signal Processing*, Vol. 19, No. 5, pp. 1107-1134, 2005.
13. Anders, J. W., and Franchek, M. A., ``An Instrumental Variable Approach to Nonlinear Model-Based Adaptive Control of Engine Speed,`` *International Journal of Control*, Vol. 78, No. 1, pp. 29-44, 2005.
14. Kostek, T. M., Krousgrill, C., and Franchek, M. A., ``Eigenvector Analysis of an Active Vibration Control System,`` *Noise Control Engineering Journal*, Vol. 52, No. 4, pp. 169-178, 2004.
15. Osburn, A. W., and Franchek, M. A., ``Designing Robust Repetitive Controllers,`` *Journal of Dynamic Systems, Measurement, and Control*, Vol. 126, No. 4, pp. 865-872, 2004.
16. Osburn, A. W., and Franchek, M. A., ``Transient Air/Fuel Ratio Controller Identification Using Repetitive Control,`` *Journal of Dynamic Systems, Measurement, and Control*, Vol. 126, No. 4, pp. 781-789, 2004.
17. Glass, J. W., and Franchek, M. A., "Convergence and Computation of Describing Functions Using a Recursive Volterra Series," *International Journal of Robust and Nonlinear Control*, Vol. 14, No. 18, pp. 1469-1488, 2004.
18. Hu, S., Howell, S., Raman, A., Reifenberger, R., and Franchek, M. A., ``Frequency Domain Identification of Tip-Sample van der Waals Interactions in Resonant Atomic Force Microcantilevers,`` *Journal of Vibrations and Acoustics, Transactions of the ASME, Special Issue on MEMS Modeling in Dynamic and Acoustics*, Vol. 126, No. 3, pp. 343-351, 2004.
19. Kook, H., Mongeau, L., and Franchek, M. A., ``Active Control of Pressure Fluctuations Due to Flow Over Helmholtz Resonators,`` *Journal of Sound and Vibration*, Volume 255(1), pp. 61-76, 2002.
20. de Bedout, J. M., and Franchek, M. A., "Stability Conditions for the Sequential Design of Non-diagonal Multivariable Feedback Controllers," *International Journal of Control*, Vol. 75, No. 12, pp. 910-922, 2002.
21. Glass, J. W., and Franchek, M. A., "H_∞ Synthesis of Nonlinear Feedback Systems in a Volterra Representation," *Journal of Dynamic Systems, Measurement, and Control*, Vol. 124, No. 3, pp. 382-389, 2002.

22. Ingram, G., Franchek, M. A., and Chiu, G. C., "Reducing Operator Induced Machine Vibration Using Complex Pole/Zero Prefilter Design," *Journal of Sound and Vibration*. Volume 250(2), pp. 197-213, 2002.
23. Stroh, D. J., Franchek, M. A., and Kerns, J. M., "Fueling Control of Spark Ignition Engines," *International Journal of Vehicle Mechanics and Mobility*, Vol. 36, No. 4-5, pp. 329-358, 2001.
24. Kostek, T. M., and Franchek, M. A., "Hybrid Noise Control in Ducts," *Journal of Sound and Vibration*, **237**(1), pp. 81-100, 2000.
25. Montgomery, S. W., Franchek, M. A., Goldschmidt, V. W., "Analytical Dispersion Force Calculations for Nontraditional Geometries," *Journal of Colloid and Interface Science* Vol. 227, No. 2, pp. 567-584, 2000.
26. Glass, J. W., and Franchek, M. A., "Stability of Nonlinear Feedback Systems in a Volterra Representation," *International Journal of Robust and Nonlinear Control* **10**, Issue 10, pp. 799-819, 2000.
27. Heatwole, C., Franchek, M. A., and Bernhard, R. J., "Robust Feedback Control of Flow Induced Structural Radiation of Sound," *IEEE Transactions on Control System Technology* Vol. 8, No. 2, pp. 228-235, 2000.
28. Albert, D., Franchek, M. A., and Bernhard, R. J., "Active Control of Transmission Loss in Lightly Damped Panels" *Noise Control Engineering Journal*, **48**(2), pp. 48-59, 2000.
29. Glass, J. W., and Franchek, M. A., "Frequency Based Nonlinear Controller Design for Regulating Systems Subjected To Time Domain Constraints" *International Journal of Robust and Nonlinear Control*, **10**, Issue 1, pp. 39-57, 2000.
30. Herman, P., and Franchek, M. A., "Engine Idle Speed Control Using Actuator Saturation," *IEEE Transactions on Control Systems Technology*, Vol. 8, No. 1, pp. 192-199, 2000.
31. Shah, M., and Franchek, M. A., "Frequency Based Controller Design for a Class of Nonlinear Systems," *International Journal of Robust and Nonlinear Control*, **9**, pp. 825-840, 1999.
32. de Bedout, J. M., Franchek, M. A., and Bajaj, A. K., "Robust Control of Chaotic Vibrations for Impacting Heat Exchanger Tubes in Crossflow," *Journal of Sound and Vibration*, Volume 227(1), pp. 183-204, 1999.
33. Herman, P., and Franchek, M. A., "Performance Enhancement of Fixed Regulating Systems Via Actuator Saturation," *Journal of Dynamic Systems, Measurement, and Control* Vol. 121, No. 1, pp. 34-40, 1999.

34. Glass, J. W. and Franchek, M. A., "NARMAX Modeling and Robust Control of Internal Combustion Engines," *International Journal of Control*, Vol. 72, No. 4, pp. 289-304, 1999.
35. Franchek, M. A., and Herman, P. A., "Direct Connection Between Time Domain Performance and Frequency Domain Characteristics," *International Journal of Robust and Nonlinear Control* **8**, pp. 1021-1042, 1998. ERRATUM **9**, p. 120, 1999.
36. Piedmonte, M., Meckl, P., Nwokah, O. D. I., and Franchek, M., "Multivariable Vibration Control of a Coupled Flexible Structure Using QFT," *International Journal of Control*, Vol. 69, No. 4, pp. 475-498, 1998.
37. Montgomery, S. W., Goldschmidt, V. W., and Franchek, M. A., "Vacuum Assisted Drying of Hydrophilic Plates: Static Drying Experiments," *International Journal of Heat Mass Transfer*, Vol. 41, No. 4-5, pp. 735-744, 1998.
38. Buhr, C., Franchek, M. A., and Bernhard, R. J., "Noncollocated Adaptive-Passive Vibration Control," *Journal of Sound and Vibration* **206**(3), 25, pp.371-398, 1997.
39. Heatwole, C. M., Franchek, M. A., and Bernhard, R. J., "Robust Feedback Control of Flow Induced Structural Radiation of Sound," *Journal of the Acoustical Society of America* **120** (2) Pt. 1, pp. 989-997, 1997.
40. de Bedout, J. M., Franchek, M. A., Bernhard, R. J., and Mongeau, L., "Adaptive-Passive Noise Control," *Journal of Sound and Vibration*, **202**(1), pp. 109-123, 1997.
41. Franchek, M. A., Herman, P., and Nwokah, O. D. I., "Robust Nondiagonal Controller Design for Uncertain Multivariable Regulating Systems" *Journal of Dynamic Systems, Measurement, and Control* Vol. 119, No. 1, pp. 80-85, 1997.
42. Hamilton, G. K., and Franchek, M. A., "Robust Controller Design and Experimental Verification of I.C. Engine Speed Control," *International Journal of Robust and Nonlinear Control*, Invited Journal Paper, Vol. 7, pp. 609-627, 1997.
43. Bunker, B. J., Franchek, M. A., and Thomason, B. E., "Robust Multivariable Control of an Engine-Dynamometer System," *IEEE Transactions on Control Systems Technology*, Vol. 5, No. 2, pp. 189-199, 1997.
44. Franchek, M. A., "Selecting the Performance Weights for the μ and H_∞ Synthesis Methods for SISO Regulating Systems," *Journal of Dynamic Systems, Measurement, and Control*, Vol. 118, No. 1, pp. 126-131, 1996.
45. Franchek, M. A., Ryan, M. W., and Bernhard, R. J., "Adaptive-Passive Vibration Control," *Journal of Sound and Vibration*, **189**(5), pp. 565-585, 1995.
46. Franchek, M. A., and Jayasuriya, S., "Controller Design for Performance Guarantees in Uncertain Regulating Systems," *International Journal of Control*, Vol. 61, No. 1 pp. 127-148, 1995.

47. Nordgren, R., Franchek, M. A., and Nwokah, O. D. I., "A Design Procedure for the Exact H_{∞} Robust Performance Problem," *International Journal of Robust and Nonlinear Control*, Vol. 5, pp. 107-118, 1995.
48. Jayasuriya, S., and Franchek, M. A., "A QFT Type Design Methodology for a Parallel Plant Structure and Its Application in Idle Speed Control," *International Journal of Control*, Vol. 60, No. 5, pp. 653-670, 1994.
49. Nordgren, R., Nwokah, O. D. I., and Franchek, M. A., "New Formulations for Quantitative Feedback Theory," *International Journal of Robust and Nonlinear Control*, Vol. 4, pp. 47-64, 1994.
50. Jayasuriya, S., and Franchek, M. A., "Frequency Domain Design for Maximal Rejection of Persistent Bounded Disturbances," *Journal of Dynamic Systems, Measurement and Control*, Vol. 113, No. 2, pp. 195-205, 1991.
51. Jayasuriya, S., and Franchek, M. A., "A Class of Transfer Functions with Non-Negative Impulse Response," *Journal of Dynamic Systems, Measurement and Control*, Vol. 113, No. 2, pp. 313-315, 1991.

BOOKS, BOOK CHAPTERS and EDITORSHIPS

1. Franchek, M. A., editor, *2001 Dynamic Systems and Control Division, International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineering, 2001.
2. Bajaj, A.K., Namachchivaya, N. Sri and Franchek, M. A., editors, *Nonlinear Dynamics and Control*, Vol. DE-91, American Society of Mechanical Engineering, 1996.

JOURNAL ABSTRACTS

1. Khalil, H. A., Franchek, M. A., Metcalfe, R. W., Benkowski, R. J., Cohn, W. E., Frazier, O. H., and Kadipasaoglu, K. A., "Feedback Control of the Continuous Flow Total Artificial Heart," *American Society for Artificial Internal Organs (ASAIO) Journal*, **52**(2), 2006.
2. Khalil, H. A., Franchek, M. A., Metcalfe, R. W., Frazier, O. H., Kadipasaoglu, K. A., "Simulation of TAH Circuit with Tandem Continuous-Flow VADs," *American Society for Artificial Internal Organs (ASAIO) Journal*, **51**(2), 2005.

REFEREED CONFERENCE PUBLICATIONS

Acceptance Based on a Full Paper Review

1. Mohammadpour Velni, J., Grigoriadis, K. M., Franchek, M. A., and Zwissler, B. J., "Real Time Diagnostics in the EGR System of Diesel Engines," *2008 American Control Conference*, (to appear).
2. Dawson, B. M., Franchek, M. A., Grigoriadis, K. M., "Data Driven Simplified Three-Way Catalyst Health Diagnostic Models: Experimental Results," *Proceedings of the ASME Dynamic Systems and Control Division 2007*, Paper Number *IMECE2007-42281*, Seattle, Washington, November 11-15, 2007.
3. Mohammadpour Velni, J., Grigoriadis, K. M., Franchek, M. A., and Zwissler, B. J., "A Survey on Prognosis Research: Theory and Applications," *Proceedings of ASME Dynamic Systems and Control Division 2006*, Paper Number *IMECE2006-15044*, Chicago, Illinois, November 5-10, 2006.
4. Zhang, F., Grigoriadis, K. M., Franchek, M. A., and Makki, I., "Transient Lean Burn Air-Fuel Ratio Control Using Input Shaping Method Combined with Linear Parameter Varying Air-Fuel Ratio Control," *2006 American Control Conference*, Minneapolis, Minnesota, pp. 3290-3295, 2006.
5. Franco, J., Franchek, M. A., and Grigoriadis, K. M., "Real-Time Estimation of engine Torque Using Speed Wheel Information," *Proceedings of the ASME Dynamic Systems and Control Division 2006*, Paper Number *IMECE2006-13334*, Chicago, Illinois, November 5-10, 2006.
6. Anders, J. W., and Franchek, M. A., "Nonlinear Adaptive Engine Speed Control Using an Instrumental Variables Approach and a Truncated Volterra Series," *Proceedings of the ASME Dynamic Systems and Control Division 2005*, DSC Vol. 74, No. 1, Part A, Paper Number *IMECE2005-79030*, Orlando, Florida, pp. 281-288, 2005.
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2. Sethi, V., Franchek, M. A., and Song, G., ``Multimodal Active vibration Suppression of a Flexible Structure by Loop Shaping,`` *Proceedings of SPIE-The International Society for Optical Engineering*, Vol. 5764, Smart Structures and Materials 2005-Smart Structures and Integrated Systems, pp. 348-359, 2005.
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GRADUATE STUDENT SUPERVISION

Ph.D. Graduates

1. Javad Mohammadpour Velni

Filtering and Fault Tolerant Control of Parameter-Varying Time-Delay Systems and Applications

Ph.D., University of Houston, December 2007, (Published, co-advised with Grigoriadis as primary advisor)

2. Feng Zhang

Linear Parameter Varying Control of Nonlinear Systems with Application to Engine Control

Ph.D., University of Houston, December 2006, (Published, co-advised with Grigoriadis as primary advisor)

3. Grant Ingram

Lean NOX Trap Modeling for Lean Burn Engine Control and Improved Fuel Economy

Ph.D., Purdue University, December 2005, (Published)

4. Ted Kostek

Aging of Zeolite Based Automotive Hydrocarbon Traps with Application to Diagnostics,

Ph.D., Purdue University, May 2005, (Published)

5. Andrew W. Osburn

Performance Enhancement of Internal Combustion Engines Using Crank-Angle Domain Control,

Ph.D., Purdue University, December 2003, (Published)

6. Craig Buhr

Active Control of Rotating Stall in Compressors,

Ph.D., Purdue University, August 2003, (Published, co-advised with S. Fleeter)

7. **John Glass**
Frequency Based Nonlinear Controller Design for Regulating Systems Subject to Time Domain Constraints,
Ph.D., Purdue University, December 2000, (Published)
8. **Juan DeBedout**
Sequential Multivariable Feedback Controller Design for Fault-Tolerant Applications,
Ph.D., Purdue University, December 2000, (Published)
9. **Stephen W. Montgomery,**
Surface Microscopy and Particulate Adhesion,
Ph.D., Purdue University, December 2000 (Published, co-advised with V. Goldschmidt).
10. **Minesh Shah,**
Steady State Adaptive Fueling Control,
Ph. D., Purdue University, August 1998 (Published).
11. **Paul Herman,**
Performance Enhancement of Regulating Systems Via Actuator Saturation,
Ph. D., Purdue University, May 1997 (Published).
12. **Craig Heatwole,**
Robust Feedback Control of Flow Induced Structural Radiation of Sound,
Ph. D., May 1997 (Published, co-advised with R. Bernhard).
13. **Steve Koffman,**
A Modified Gaussian Neural Network and Growth/Training Algorithm for On-Line Identification of Nonlinear Dynamic Systems,
Ph.D., May 1997 (Unpublished).

Masters Graduates

1. **Idalia Ovalle**
Automated Governor Calibration,
MSME, University of Houston, December 2007, (Published, co-Chair Grigoriadis)
2. **Javier Franco**
Torque Estimation Based on Harmonic Analysis in the Crank-Angle Domain,
MSME, University of Houston, August 2005, (Published, co-advisor Grigoriadis)
3. **Jon Anders**
An Instrumental Variable Approach to Nonlinear Model Based Adaptive Control of Engine Speed,
M.S.M.E., Purdue University, August 2003 (Published)
4. **Patrick J. Buehler**
Fault Detection, Isolation, and Identification Via Information Synthesis,

M.S.M.E., Purdue University, August 2002 (Published)

5. **Jeremiah Brown**

Information Synthesis with Applications to Electromechanical Systems,
M.S.M.E., Purdue University, May 2002 (Published)

6. **Jeffrey David Dawson**

An Investigation of the Feasibility of Fluidics for Active Noise Control,
M.S.M.E., Purdue University, May 2002 (co-advised with R. Bernhard)

7. **Ryan Roecker**

Advanced Engine Diagnostics,
M.S.M.E. (project), Purdue University, May 2001

8. **Patrick Cunningham**

Automated Speed Controller Synthesis for Internal Combustion Engines,
M.S.M.E., Purdue University, December 2000 (Published).

9. **Alaina Pizzo**

Multivariable Modeling and Robust Control Technology,
M.S.M.E., Purdue University, December 2000

10. **David J. Stroh**

Transient and Steady State Adaptive Fueling Control of Internal Combustion Engines,
M.S.M.E., Purdue University, August 2000 (Published).

11. **Leslie Blake**

(Co-Advised with V. Goldschmidt)
Particle Adhesion Forces in the Presence of Oil,
M.S.M.E., Purdue University, May 2000 (Unpublished due to confidentiality).

12. **Ian Whiting**

Diagnostics of Hydraulic Pumps,
M.S.M.E., Purdue University, December 1999 (Unpublished due to confidentiality).

13. **Grant Ingram,**

Improving Operator Perception of Machine Response,
M.S.M.E., Purdue University, August 1999 (Published).

14. **Brian Block,**

Dynamic Modeling and Control of Magnetorheological Fluids,
M.S.M.E. (project), Purdue University, May 1999 (Unpublished).

15. **David Albert,**

Active Control of Transmission Loss in Lightly Damped Panels,
M.S.M.E., Purdue University, May 1999 (Published).

16. **Lane Smith,**
Nonlinear Modeling and Robust Control of a Single Cylinder I.C. Engine for Hybrid Vehicle Applications,
M.S.M.E., Purdue University, December 1998 (Unpublished).
17. **Theodore M. Kostek,**
Hybrid Noise Control in Ducts,
M.S.M.E., Purdue University, May 1998 (Published).
18. **John Glass,**
NARMAX Modeling and Robust Controller Design of Internal Combustion Engines,
M.S.M.E., Purdue University, December 1997 (Published).
19. **Steve Montgomery,**
Thermal Performance of Cloths Dryers: Vacuum Assisted Drying,
M.S.M.E., Purdue University, December 1996 (Published, co-advised with V. Goldschmidt).
20. **Michael Plahuta,**
Robust Control of Hydraulic Motors,
M.S.M.E. (project), Purdue University, December 1996 (Published).
21. **Craig Buhr,**
Noncollocated Adaptive-Passive Vibration Control Using Self-Tuning Vibration Absorbers,
M.S.M.E., Purdue University, August 1996 (Published).
22. **Juan M. de Bedout,**
Adaptive-Passive Noise Control With Self-Tuning Helmholtz Resonators,
M.S.M.E., Purdue University, May 1996 (Published).
23. **G. Kent Hamilton,**
Robust Controller Design for Internal Combustion Engines,
M.S.M.E., Purdue University, May 1996 (Published).
24. **Matthew Ryan,**
Adaptive Passive Vibration Control,
M.S.M.E., Purdue University, December 1994 (Published).
25. **Byron Bunker,**
Multivariable Control of an Engine-Dynamometer System,
M.S.M.E., Purdue University, August 1994 (Published).
26. **Weiguang Niu,**
Robust Controller Design for Highly Coupled Multivariable Systems,

M.S.E., Purdue University, May 1994 (Published).

UNDERGRADUATE STUDENT SUPERVISION

1. **Daniel Kerr** (SS06)
Topic: *Nonlinear Modeling of a Mock Circulatory System*
2. **Steven Ivers** (SS06)
Topic: *Changes in Artery Permeability Under Continuous Flow Conditions*
Co-Advisor: Dr. E. Tuzun, Texas Heart Institute
3. **Hassan Khalil** (SS05, SS06)
Topic: *Cardiovascular Mock Circulatory System Modeling and Control*
4. **Charles Flueck** (S02)
Topic: *Occupancy Detection*
5. **Gerardo Gomez** (S02)
Topic: *Active Suspension Control*
6. **Cynthia Wallace** (SS00, S01)
Topic: *Smart Automotive Seats*
7. **Ryan Solecki** (S00)
Topic: *Engine Diagnostics*
8. **Matthew Richards** (S00)
Topic: *Automated Modeling Software Development*
9. **Patrick Cunningham** (F97)
Topic: *Advanced Modeling of Internal Combustion Engines*
10. **Matthew Evans** (S97)
Topic: *Dynamic Modeling of Wash Machine Agitators*
11. **Lane Smith** (S96, F95, SS95)
Topic: *Modeling Automatic Transmissions and Control of Electronic I. C. Engine Throttles*
12. **David Alberts** (SS95)
Topic: *Design and Construction of Electronic Throttles*
13. **Thomas Fletcher** (S95, F94, SS94)
Topic: *Electronic Hardware Design/Development and Computer Interfacing for the Control of a V-8 Fuel Injected Engine*
14. **Brian Begeman** (F94, SS94)
Topic: *Intelligent Electro-Mechanical-Acoustical Devices Applied to Noise Control*

15. **Steve Ebert** (S94, F94)

Topic: *Investigating Spark Control of Distributorless Fuel Injected Engines*

16. **Carol Jo Bates** (F93, SS93)

Topic: *A Comparison Study of Adaptive-Passive Vibration Control to Active Vibration Control*

17. **Brian Barhorst** (SS93)

Topic: *Design/Development of a Transmission Torque Loading Facility*