MATTHEW A. FRANCHEK

University of Houston
Department of Mechanical Engineering
W214 Engineering Building
Houston, Texas 77204-4006
June 2011

EDUCATION

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

PROFESSIONAL EXPERIENCES

April 2011 -Present	**DIRECTOR of Subsea Engineering** University of Houston Department of Mechanical Engineering
August 2002 -Present	**PROFESSOR** University of Houston Department of Mechanical Engineering
August 2002 -December 2009	**PROFESSOR and CHAIR** University of Houston Department of Mechanical Engineering
August 2002 -May 2009	**PROFESSOR and 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 powertrains).

PROFESSIONAL SOCIETIES

American Society of Mechanical Engineers
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
- Vice Chair, Advisory Committee Member, Dynamics Systems and Control Conference, American Society of Mechanical Engineers, 2011-2012
- Member, Advisory Committee Member, Dynamics Systems and Control Conference, American Society of Mechanical Engineers, 2009-2011
- Chair, Nominating Committee, Dynamics Systems and Control Conference, American Society of Mechanical Engineers, 2009-2010
- Advisory Committee Member, Dynamics Systems and Control Conference, American Society of Mechanical Engineers, 2009-2011
- Vice Chair for Special Sessions, Dynamics Systems and Control Conference, American Society of Mechanical Engineers, 2009
- Chair, Dynamic Systems and Control Division, American Society of Mechanical Engineers, 2008-2009 with a certificate of testimony from the ASME Board of Governors
- Vice-Chair, Dynamic Systems and Control Division, American Society of Mechanical Engineers, 2007-2008

- Member, Dynamic Systems and Control Division, American Society of Mechanical Engineers, 2005-2007
- Dynamic Systems and Control Strategic Planning, April 19-20, 2008, St. Louis, MO
- Associate Editor, ASME Journal of Dynamic Systems, Measurement and Control, 2002-2009
- Member of the 2008 Leadership Training Conference, American Society of Mechanical Engineers, March 7-9, 2008
- Executive Committee Member, Dynamic Systems and Control Division, American Society of Mechanical Engineers, 2005-2011
- 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)

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. **Surgery Mentee** at the Texas Heart Institute on the implant of left ventricular assist devices and total artificial heart replacements (animal studies only)
4. **Panel Member** for an external advisory committee on Systems Engineering for Dr. John Wall, Chief Technology Officer at Cummins Incorporated, May 5, 2006
5. **External Reviewer** for a Doctorate Examination, Greg Shaver, Stanford University, Department of Mechanical Engineering, May 6, 2005
6. **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
7. **Invited Participant** to the ***Texas Academy of Scientist, Engineers and Physicians***, January 2004 (Invited by Dr. Hussain)
8. **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
9. **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.*
10. **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.*
11. **1997 Feddersen Faculty Fellow**, School of Mechanical Engineering, Purdue University, $25,000
12. **Harry L. Solberg Best Teacher Award**, School of Mechanical Engineering, Purdue University, 1994 and 1999
13. **Citation for Excellence in Undergraduate Teaching**, School of Mechanical Engineering, Purdue University, (Rated as one of the top 10 teachers), Multiple Awards
14. **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 with The Methodist Hospital Research Institute. External speakers included Dr. Frank Yin (Washington University), Dr. Kenneth Lutchen (Boston University) and Dr. Yongmin Kim (University of Washington). Internal participants included R. Girotto (President and CEO, The Methodist Hospital), Dr. M. Lieberman (President, The Methodist Hospital Research Institute), Dr. D. Foss (UH Provost), and 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. Elected by the faculty.
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 diversity grievance.
6. **Research Incentives Committee Meeting**, Engineering Representative Reporting to Professor Gary Isom, VP of Research, 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 *New Course Introduction*	14	Evaluations not given	Evaluations not given

* Won the inaugural Outstanding Teaching Assistant Teaching Award

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 *Restructured Course*	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 *Restructured Course*	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 *New Course Introduction*	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	Normalized Prof Scores (Scores >1 are Above Average)
F03	BIOE 1197	Introduction to Biomedical Engineering *New Course Introduction*	15/17	3.79/4.0	3.97/4.0	1.05
S06	BIOE 3350	Biosensors II *New Course Introduction*	10/10	*Not on Student Survey*	4.00/4.0 *Section Avg=3.25*	1.23
F06	MECE 7397	System Identification	15/15	*Not on Student Survey*	3.53/4.0 *Section Avg=3.5*	1.01
S07	BIOE 3350	Biosensors II	N/A	*Evaluations not given.*	*N/A*	*N/A*
S08	MECE 7397	Linear Feedback Design	12/13	*4.75/5.0 Section Avg=4.30*	*4.92/5.0 Section Avg=4.48*	*1.10*
S11	MECE 6397	System Identification	19/19	*4.53/5.0 Section Avg=4.10*	*4.74/5.0 Section Avg=4.22*	*1.10*

REFEREED ARCHIVAL PUBLICATIONS

1. Kumar, P., Franchek, M., Grigoriadis, K. and Balakotaiah, V., ``Fundamentals-Based Low-Dimensional Combustion Modeling of Spark Ignited Internal Combustion Engines,'' American Institute of Chemical Engineers, (to appear).
2. Kessentini, S., Choura, S., Najar, F., Franchek, M. A., ``Modeling and Dynamics of a Horizontal Axis Wind Turbine,'' Journal of Vibration and Control, Volume 16, No. 3, pp. 2001-2021, 2010.
3. Mohammadpour, J., Grigoriadis, K., Franchek, M. and Zwissler, B. J., ``Real-Time Diagnostics of the Exhaust Recirculation in Diesel Engines Using Least Squares Parameter Estimation,'' Journal of Dynamic Systems, Measurement and Control, Volume 132, pp. 011009-1—011009-8, 2010.
4. Anandampillai, S., Zhang, X., Sharma, P., Lynch, G. C., Franchek, M. A., and Larin, K. V., "Quantum dot-DNA interaction: Computational issues and preliminary insights on use of quantum dots as biosensors,'' *Computer Methods in Applied Mechanics and Engineering*, Volume 197, pp. 3378-3385, 2008.
5. Zhang, F., Grigoriadis, K. M., Franchek, M. A. and Makki, I. H., ``Transient Lean Burn Air-Fuel Ratio Linear Parameter Varying Control Using Input Shaping,'' *International Journal of Modelling, Identification and Control*, Vol. 3, No. 3, pp. 318-326, 2008*.

* Rated as one of the Top 10 articles downloaded from the ASME Journal Dynamic Systems Measurement and Control Webpage.

6. Sethi, V., Song, G., and Franchek, M. A., ``Loop Shaping Control of a Model Story Building Using Smart Materials,'' *Journal of Intelligent Material Systems and Structures*, Vol. 19, No. 7, pp. 765-778, 2008.
7. 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*, 54, pp. 249-255, 2008.
8. 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.
9. 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*.
10. 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*.
11. 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*.
12. 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.
13. 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*.
14. 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.
15. 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.
16. 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.
17. 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,

* Rated as one of the Top 10 articles downloaded from the ASME Journal Dynamic Systems Measurement and Control Webpage.

pp. 1413-1423, 2005. *Listed as one of the TOP 25 Hottest Articles by ScienceDirect, rated as 10 of 25.*

18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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. *Best Journal Paper Award*
28. 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.
29. 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.
30. Kostek, T. M., and Franchek, M. A., "Hybrid Noise Control in Ducts," *Journal of Sound and Vibration*, **237**(1), pp. 81-100, 2000.

31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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.
43. Montgomery, S. W., Goldschmidt, V. W., and Franchek, M. A., "Vacuum Assisted Drying of Hydrophilic Plates: Static Drying Experiments," *International Journal of Heat M*ass *Transfer*, Vol. 41, No. 4-5, pp. 735-744, 1998.
44. 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.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

50. 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.

51. 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.

52. 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.

53. 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.

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(*List Does **Not** Include Research Review Presents for Funded Research*)

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19. *So You Want to Be a Faculty Member*, American Society for Engineering Education, Student Chapter, Purdue University, November 9, 1995.
20. *Developing a Controller Design Methodology for Time Domain Performance Guarantees*, School of Chemical Engineering, Purdue University, November 8, 1995.
21. *Control and Measurement Systems in Mechanical Engineering*, Dean's Invitational, Purdue University, October 26, 1995.
22. *Multivariable Control of Heat Engines with Significant Loop Interactions*, United Technologies Pratt & Whitney, West Palm Beach, Florida, August 22, 1995.
23. *Designing Feedback Controllers for Nonlinear Systems*, Cummins Engine Company, Columbus, Indiana, September 29, 1994.
24. *Feedback Controller Design for Time Domain Performance Specifications*, Scientific Research Laboratories, Ford Motor Company, Dearborn, Michigan, August 18, 1994.
25. *Feedback Controller Design for Performance Maximization of Multivariable Systems*, Advanced Powertrain Engineering, Ford Motor Company, Allen Park, Michigan, August 15, 1994.
26. *Adaptive-Passive Vibration Control*, Lord Corporation, Cary, North Carolina, May 23, 1994.
27. *Robust Idle Speed Control of Fuel Injected Engines*, Lord Corporation, Cary, North Carolina, May 23, 1994.
28. *Panelist on the Future Directions and Issues for Noise and Vibration Control*, Noise-Con 94, Fort Lauderdale, Florida, May 3, 1994.
29. *Robust Multivariable Control of Internal Combustion Engines Having Significant Induction to Power Delays*, Cummins Engine Company, January 20, 1994.
30. *Frequency Domain Design for Uncertain Regulating Systems*, University of Texas at Arlington, September 1991.

NEWS AND PRESS RELEASES
(selected articles)

1. **Discovery News,** *Artificial Heart Would Make No 'Lub Dub'*, October 27, 2008.
2. **Design News,** *Mechatronic Artificial Heart Doesn't Beat*, October 24, 2008.
3. **Houston Chronicle,** *Stump the Scholar*, A question & answer column intended to engage the general public in science and engineering, July 19, 2005.

4. **Houston Chronicle,** *Engineering One's Options. Universities teach students for future engineering needs,* Interview presenting the need for invention and discovery from a 21st century engineering education, July 19, 2005.
5. **Mechanical Engineering Magazine,** *Teaching Bio-Sense*, February 2004 Issue, American Society of Mechanical Engineering, 2004.
6. **OEM Off-Highway,** *Fluid Network,* Vol. 19, Number 4, May 2001.
7. **Earth Mover and Civil Contractor Magazine,** *Who's In Charge? Putting Microchips in the Operator's Seat*, February 2001.
8. **Mechanical Engineering Magazine,** *The Golden Ratio,* February 2001 Issue, American Society of Mechanical Engineering, 2001.
9. **European Automotive Design,** *Advanced ECU Keeps Cars Clean as They Age,* October 2000.
10. **Business Week,** *Developments to Watch: Dumbing Down Your Fuel System*, September 11, 2000.
11. **WASK Radio Station,** Lafayette, Indiana, *Cleaner Running Engines*, August 21, 2000.
12. **Journal and Courier,** Lafayette, Indiana, *New Technology Will Increase Engine Life,* August 20, 2000.
13. **Environmental Data Interactive Exchange (EDIE),** *New Electronic System Will Control Car Exhaust Emissions,* August 4, 2000.
14. **Clear Air Today,** EIN Publishing, www.eintoday.com, *Ford, Purdue Team to Develop Onboard Electronics*, August 2, 2000.
15. **HowStuffWorks.com,** news-item130.htm, *Maintaining Engine Performance in Aging Cars***,** August 2, 2000.
16. **WLFI-TV 18,** Lafayette, Indiana, *Engineering of the Future, Smart Engines*, July 20, 2000, 11:00 pm news.

SHORT COURSES

1. *Introduction to Automated Modeling and Control of Physical Systems*, Rolls Royce-North America, Indianapolis, Indiana, December 16-17, 1998.
2. *Introduction to Feedback Control*, Ford Motor Company, Detroit, Michigan, August 17-18, 1998.
3. *Automatic Control*, Herrick Laboratories Partner Program, May 28-29, 1998 (co-taught with G. Chiu).
4. *Developing Engineered Dynamic Models Intended for Controller Design*, Cummins Engine Company, Columbus, Indiana, February 9-10, 1998.
5. *Developing Parametric Uncertain Models of Internal Combustion Engines for Controller Design*, Cummins Engine Company, Columbus, Indiana, August 6-8, 1997.
6. *Automatic Controls,* American Society of Mechanical Engineers Sponsored Engineering in Training (EIT) Examination Videotape Series, May 1996.

7. *Developing Engineered Dynamic Models for Controller Design*, Ford Motor Company, Detroit, Michigan, June 5-7, 1995.

STUDENT ADVISING

Ph.D. Graduates

1. **Rafik Borgi**
   Modeling Ultrasound Wave Propagation for Tissue Characterization
   Ph.D., University of Houston, December 2010, (Published)
2. **Javad Mohammadpour**
   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)

3. **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)

4. **Grant Ingram**
   Lean NO_X Trap Modeling for Lean Burn Engine Control and Improved Fuel Economy
   Ph.D., Purdue University, December 2005, (Published)

5. **Ted Kostek**
   Aging of Zeolite Based Automotive Hydrocarbon Traps with Application to Diagnostics,
   Ph.D., Purdue University, May 2005, (Published)

6. **Andrew W. Osburn**
   Performance Enhancement of Internal Combustion Engines Using Crank-Angle Domain Control,
   Ph.D., Purdue University, December 2003, (Published)

7. **Craig Buhr**
   Active Control of Rotating Stall in Compressors,
   Ph.D., Purdue University, August 2003, (Published, co-advised with S. Fleeter)

8. **John Glass**
   Frequency Based Nonlinear Controller Design for Regulating Systems Subject to Time Domain Constraints,
   Ph.D., Purdue University, December 2000, (Published)

9. **Juan DeBedout**

Sequential Multivariable Feedback Controller Design for Fault-Tolerant Applications, Ph.D., Purdue University, December 2000, (Published)

10. **Stephen W. Montgomery**,
    Surface Microscopy and Particulate Adhesion,
    Ph.D., Purdue University, December 2000 (Published, co-advised with V. Goldschmidt).

11. **Minesh Shah**,
    Steady State Adaptive Fueling Control,
    Ph. D., Purdue University, August 1998 (Published).

12. **Paul Herman**,
    Performance Enhancement of Regulating Systems Via Actuator Saturation,
    Ph. D., Purdue University, May 1997 (Published).

13. **Craig Heatwole**,
    Robust Feedback Control of Flow Induced Structural Radiation of Sound,
    Ph. D., May 1997 (Published, co-advised with R. Bernhard).

14. **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. **Brandon Dawson**
   A Systematic Methodology for Diagnostics of an Automotive Three-Way Catalyst
   MSME, University of Houston, May 2008, (Published, co-advisor Grigoriadis)

2. **Idalia Ovalle**
   Automated Governor Calibration,
   MSME, University of Houston, December 2007, (Published, co-advisor Grigoriadis)

3. **Javier Franco**
   Torque Estimation Based on Harmonic Analysis in the Crank-Angle Domain,
   MSME, University of Houston, August 2005, (Published, co-advisor Grigoriadis)

4. **Jon Anders**
   An Instrumental Variable Approach to Nonlinear Model Based Adaptive Control of Engine Speed,
   M.S.M.E., Purdue University, August 2003 (Published)

5. **Patrick J. Buehler**
   Fault Detection, Isolation, and Identification Via Information Synthesis,

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

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

7. **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)

8. **Ryan Roecker**
   Advanced Engine Diagnostics,
   M.S.M.E. (project), Purdue University, May 2001

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

10. **Alaina Pizzo**
    Multivariable Modeling and Robust Control Technology,
    M.S.M.E., Purdue University, December 2000

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

12. **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).

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

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

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

16. **David Albert**,
    Active Control of Transmission Loss in Lightly Damped Panels,

M.S.M.E., Purdue University, May 1999 (Published).

17. **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).

18. **Theodore M. Kostek**,
Hybrid Noise Control in Ducts,
M.S.M.E., Purdue University, May 1998 (Published).

19. **John Glass**,
NARMAX Modeling and Robust Controller Design of Internal Combustion Engines,
M.S.M.E., Purdue University, December 1997 (Published).

20. **Steve Montgomery**,
Thermal Performance of Clothes Dryers: Vacuum Assisted Drying,
M.S.M.E., Purdue University, December 1996 (Published, co-advised with V. Goldschmidt).

21. **Michael Plahuta**,
Robust Control of Hydraulic Motors,
M.S.M.E. (project), Purdue University, December 1996 (Published).

22. **Craig Buhr**,
Noncollocated Adaptive-Passive Vibration Control Using Self-Tuning Vibration Absorbers,
M.S.M.E., Purdue University, August 1996 (Published).

23. **Juan M. de Bedout**,
Adaptive-Passive Noise Control With Self-Tuning Helmholtz Resonators,
M.S.M.E., Purdue
University, May 1996 (Published).

24. **G. Kent Hamilton**,
Robust Controller Design for Internal Combustion Engines,
M.S.M.E., Purdue University, May 1996 (Published).

25. **Matthew Ryan**,
Adaptive Passive Vibration Control,
M.S.M.E., Purdue University, December 1994 (Published).

26. **Byron Bunker**,
Multivariable Control of an Engine-Dynamometer System,
M.S.M.E., Purdue University, August 1994 (Published).

27. **Weiguang Niu**,

Robust Controller Design for Highly Coupled Multivariable Systems,
M.S.E., Purdue University, May 1994 (Published).

Undergraduate Student Research

1. **Daniel Kerr** (SS06)
   Topic: *Nonlinear Modeling of a Mock Circulatory System for Total Artificial Hearts*

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 in Vehicle Seats*

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*