
CURRICULUM VITAE

David C. Zimmerman
Professor and Associate Chairman

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1.1 EDUCATION

1987	State University of New York at Buffalo	Ph.D.	M.E.
1984	State University of New York at Buffalo	M.S.	M.E.
1982	State University of New York at Buffalo	B.S.	M.E.

1.2 PROFESSIONAL EXPERIENCE

- 1993 - University of Houston
Professor and Associate Chairman (2000), Associate Professor
Department of Mechanical Engineering
Houston, Texas
- Created the Dynamic Systems and Controls Laboratory (currently 4 faculty members)
 - Established the UH/NASA JSC Design Partnership to improve undergraduate capstone design experience
 - Supports departments teaching mission by serving as the design faculty lead (replaced two of the four courses in the design sequence with two new courses), teaching 8 different courses, with 6 of those being new UH courses
- 1987 - 1993 University of Florida
Associate Professor (1992), Assistant Professor
Department of Aerospace Engineering, Mechanics & Engineering Science
Gainesville, Florida
- Created the Dynamic Systems and Controls Laboratory
 - Selected by Dean of Engineering to co-write UF portion of the successful NSF undergraduate education SUCCEED project involving 8 southeastern universities
 - Selected by Dean of Engineering to represent the College of Engineering on the State of Florida Space Research and Development Task Force

1.3 ADMINISTRATIVE EXPERIENCE

Associate Chairman, UH Department of Mechanical Engineering

Associate Director for UH - NASA University Research, Engineering and Technology (URETI) Texas Institute for Intelligent Bio-Nano Materials and Structures for Aerospace Vehicles: All internal (8 faculty) and external (6 institutions) administrative duties associated with NASA URETI Center

Technical Research Lead for NASA URETI - Intelligent Systems Group: Coordinate research activities of 10 faculty members at four different institutions

1.4 HONORS, AWARDS AND RECOGNITION

University of Houston Award of Excellence in Research and Scholarship - Associate Professor Level, 2000

South Texas ASME Young Engineer of the Year Award for Outstanding Technical Contribution, 1995

Halliburton/University of Houston Outstanding Young Researcher of the Year Award, 1995

University of Florida Outstanding Achievement and Performance Award - 1990

Best Paper Award - AIAA Dynamic Specialists Conference, 1994

Best Paper Award - ASME Adaptive Structures and Material Systems (all ASME papers in subject area), 1993

Keynote Presentation - Euromech International Workshop: DAMAS 99 - Structural Damage Assessment Using Advanced Signal Processing Procedures, July 1999, Dublin.

Keynote Presentation - 2nd International Conference on Identification in Engineering Systems at the University of Wales, Swansea, March 1999.

Best Paper Presentation Award - AIAA Houston (local) 19th Annual Technical Symposium - Session 13 - Structural Analysis, 1994

Invited Instructor - Structural Dynamics Summer School, Los Alamos National Laboratory, 2000-2002

Invited Participant in SD2000 - An International Forum to Discuss the Future of Structural Dynamics sponsored by the US Department of Energy (one of twelve "young" engineers selected internationally).

Faculty Advisor Award - AIAA Student Activities Committee (national) - 1992

Fellowship - NASA/ASEE Summer Program, 1989

Fellowship - NASA Graduate Student Program, 1983-1987 (1 of 13 new fellowships awarded nationwide in 1983)

1.5 SHORT COURSES DEVELOPED/PRESENTED:

"Current Horizon for Damage Detection" (with G. James, C. Farrar, and S. Doebling) - a three day short course developed and presented at the invitation of the Society of Experimental Mechanics (SEM) before the 15th International Modal Analysis Conference. Thirty professionals attending the short course, including personal from (i) the Federal Highway Administration, (ii) Sandia National Laboratories, (iii) National Renewable Energy Laboratory, (iv) EMPA-Swiss Federal Lab for Materials Testing, (v) US

Army White Sands Missile Range, (vi) Argonne National Laboratory, (vii) Alcoa, (viii) Kubota Corporation (Japan), (ix) NKK Corporation (Japan), and (x) Intevep, S.A. (Venezuela)

“Structural Damage Detection and Model Correlation,” - a 1/2 day short course developed and presented at the invitation of the Society for Machinery Failure Prevention Technology, April 18-21, 2005.

1.6 PUBLICATIONS

1.6.1 Journal

1. Zimmerman, D.C., Horner, G.C., and Inman, D.J., “Microprocessor Controlled Force Actuator,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 11, No. 3, May-June 1988, pp. 230-237.
2. Zimmerman, D.C., and Cudney, H.H., “Practical Implementation Issues for Active Control of Large Flexible Structures,” *ASME Journal of Vibration, Acoustics, Stress, and Reliability in Design*, Vol. 111, No. 3, July 1989, pp. 283-289.
3. Zimmerman, D.C. and Inman, D.J., “On the Nature of the Interaction Between Structures and Proof-Mass Actuators,” *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 13, No. 1, Jan.-Feb. 1990, pp. 82-88.
4. Zimmerman, D.C., “Threshold Control for Nonlinear and Time-Varying Mechanical Systems,” *Journal of Intelligent Material Systems and Structures*, Vol. 1, No. 1, Jan. 1990, pp. 76-90.
5. Zimmerman, D.C., and Widengren, M., “Correcting Finite Element Models Using A Symmetric Eigenstructure Assignment Technique,” *AIAA Journal*, Vol. 28, No. 9, Sept. 1990, pp. 1670-1676.
6. Zimmerman, D.C., Inman, D.J., and Juang, J.-N., “Vibration Suppression Using a Constrained Rate-Feedback - Threshold Control Strategy,” *ASME Journal of Vibration and Acoustics*, Vol. 113, No. 3, July 1991, pp. 345-353
7. Zimmerman, D.C., and Kaouk, M., “An Eigenstructure Assignment Approach for Structural Damage Detection,” *AIAA Journal*, Vol. 30, No. 7 July 1992, pp. 1848-1857.
8. Zimmerman, D.C., and Maddahian, A., “Quadratic Tuning of Proof-Mass Actuators,” *Mechanical Systems and Signal Processing*, Vol. 6, No. 5, 1992, pp. 447-459.
9. Kaouk, M. and Zimmerman, D.C., “Structural Damage Assessment Using a Generalized Minimum Rank Perturbation Theory,” *AIAA Journal*, Vol. 32, No. 4, 1992, pp. 836-842.
10. Zimmerman, D.C., “Structure/Control Synthesis with Nonnegligible Actuator Mass,” *ASCE Journal of Aerospace Engineering*, Vol. 6, No. 1, 1993, pp. 76-89.
11. Zimmerman, D.C., and Lyde, T.L., “Sensor Failure Detection and Isolation in Flexible Structures Using the Eigensystem Realization Algorithm,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 16, No. 3, 1993, pp. 490-497.¹
12. Zimmerman, D.C., “A Darwinian Approach to the Actuator Number and Placement Problem with Nonnegligible Actuator Mass,” *Mechanical Systems and Signal Processing*, Vol. 7, No. 4, 1993, pp. 363-374.
13. Zimmerman, D.C. and Kaouk, M., “Structural Damage Detection Using a Minimum Rank Update Theory,” *ASME Journal of Vibration and Acoustics*, April 1994, Vol. 116, No. 2, pp. 222-231.
14. Zimmerman, D.C., Simmermacher, T., “Structural Health Monitoring Using Vibration Measurements and Engineering Insight,” *ASME Design Engineering Division Special Anniversary Issue*, Vol. 117, June, 1995, pp. 214-221.²

1. *awarded 1993 ASME Adaptive Structures and Material Systems Best Paper Award*

2. *invited contribution for special issue commemorating the 50th anniversary of the ASME Design Division*

15. Zimmerman, D.C., and Simmermacher, T., "Model Correlation Using Multiple Static Load and Vibration Tests," *AIAA Journal*, Vol. 33, No. 11, 1995, pp. 2182-2188.
16. Zimmerman, D.C., Smith, S.W., Kim, H.-M., and Bartkowicz, T., "An Experimental Study Of Structural Damage Detection Using Incomplete Measurements," *ASME Journal of Vibration and Acoustics*, Vol. 118, No. 4, October 1996, pp. 543-550.
17. Zimmerman, D.C. and Kaouk, M., "Structural Health Assessment Using a Partition and Element Model Update Technique," *Journal of Chinese Society of Mechanical Engineers*, Vol. 19, No. 1, February 1998.³
18. Pappa, R.S., James III, G.H., and Zimmerman, D.C., "Autonomous Modal Identification of the Space Shuttle Tail Rudder," *AIAA Journal of Spacecraft and Rockets*, Vol. 35, No. 2, March-April 1998, pp. 163-169.
19. Abdalla, M., Grigoriadis, K.M. and Zimmerman, D.C., "Enhanced Structural Damage Detection Using Alternating Projections," *AIAA Journal*, Vol. 36, No. 7, July 1998, pp. 1305-1311.
20. James, G., Zimmerman, D.C., and Cao, T., "Development of a Coupled Approach for Structural Damage Detection," *AIAA Journal*, Vol. 36, No. 12, December, 1998, pp. 2209-2217.
21. Zimmerman, D.C., Yap, C.K., and Hasselman, T., "Evolutionary Approach for Model Correlation," *Mechanical Systems and Signal Processing*, Vol. 13, No. 4, July 1999, pp. 609-625.
22. Zimmerman, D.C., "Looking into the Crystal Ball: The Continued Need for Multiple Viewpoints in Damage Detection," *Journal of Key Engineering Materials*, Vol. 167-168, June 1999, pp. 76-90.
23. Cao, T., and Zimmerman, D.C., "Procedure to Extract Ritz Vectors from Dynamic Testing Data," *ASCE Journal of Structural Engineering*, Vol. 125, No. 12, pp. 1393-1400.
24. Abdalla, M., Grigoriadis, K.M., and Zimmerman, D.C., "Structural Damage Detection Using Linear Matrix Inequality Methods," *ASME Journal of Vibration and Acoustics*, Vol. 122, No. 4, October 2000, pp. 448-455.
25. Kaouk, M., Zimmerman, D.C. and Simmermacher, T.W., "Assessment of Damage Affecting all Structural Properties Using Experimental Modal Parameters," *ASME Journal of Vibration and Acoustics*, Vol. 122, No. 4, October 2000, pp. 456-463.
26. Zimmerman, D.C., "Model Validation and Verification of Large and Complex Space Structures," *Inverse Problems in Engineering*, Vol. 8, No. 2, April 2000, pp. 93- 118.
27. Zimmerman, D.C., Kim, H.M, Bartkowicz, T.J., and Kaouk, M., "Damage Detection Using Expanded Dynamic Residuals," special edition on System Identification in *ASME Journal of Dynamic Systems, Measurement and Control*, Vol. 123, No. 4, 2001, pp. 699-705.
28. Yap, K.C., and Zimmerman, D.C., "A Comparative Study of Structural Dynamics Modification and Sensitivity Method Approximation," *Mechanical Systems and Signal Processing*, 16(4), 2002, pp. 585-597.
29. Yap, K.C. and Zimmerman, D.C., "A Comparison of Modal Data Matching and Dynamic Residual Optimization in Structural Damage Detection," *International Journal of COMADEM*, 5(4), October 2002, pp. 5-11.
30. Boxoen, T., and Zimmerman, D.C., "Advances in Experimental Ritz Vector Identification," *ASCE Journal of Structural Engineering*, 129(8), August 2003, pp. 1131-1140.
31. Abdalla, M., Grigoriadis, K., and Zimmerman, D., "LMI Hybrid Expansion Reduction Damage Detection Method," *Journal of Vibration and Control*, 9(8), August 2003, pp. 983-996.
32. Zimmerman, D.C., Hasselman, T., and Anderson, M.C., "Approximation and Calibration of Nonlinear Structural Dynamics," *Nonlinear Dynamics*, Vol. 39, Issue 1-2, Jan 2005, pp. 113-128.

3. *invited contribution for special issue on System Identification arranged by Dr. Jer--Nan Juang*

33. Zimmerman, D.C., Simmermacher, T., and Kaouk, M., "Model Correlation and System Health Monitoring Using Frequency Domain Measurements," *Structural Health Monitoring: An International Journal*, Vol. 4, No. 3, Sept, 2005, pp. 213-228.
34. Zimmerman, D.C., and Jorgensen, S.S.F., "Parallel Multi-Species Genetic Algorithm for Physics and Parameter Estimation in Structural Dynamics," *AIAA Journal*, Vol. 43, No. 10, October, 2005, pp. 2224-2231.
35. Zimmerman, D.C., "Statistical Confidence Using Minimum Rank Perturbation Theory," accepted and to appear, *Mechanical Systems and Signal Processing*.
36. Cao, T., and Zimmerman, D.C., "Application of Load Dependent Ritz Vectors in Structural Damage Detection," submitted for publication, *AIAA Journal*.
37. Zimmerman, D.C., and Layton, D.S., "Large Angle Slewing Maneuvers Using Performance Driven Darwinian Learning Controllers: Theory and Experiment," submitted for publication, *AIAA Journal of Guidance, Control and Dynamics*.
38. Jeancolas, H., and Zimmerman, D.C., "Improving the Accuracy of Measured Ritz Vectors and Structural Damage Estimates," submitted for publication, *ASCE Journal of Structural Engineering*.
39. Lopez, F., and Zimmerman, D.C., "Structural Damage Localization Using Element Signature Recognition," submitted for publication, *AIAA Journal*
40. Link, R.J. and Zimmerman, D.C., "An Approach for Model Updating of a Multi-Physics MEMs Micromirror," submitted for publication, *ASME Journal of Vibration and Acoustics*.

1.6.2 Book Chapters

41. Zimmerman, D.C. and Weaver Smith, S., "Model Refinement and Damage Location For Intelligent Structures," *Intelligent Structural Systems* (H.S. Tzou, G.L. Anderson - Eds.), Kluwer Academic Publishers, 1992, pp. 403-452.

1.6.3 Industry/University Magazine

42. Kim, H.M., Bartkowicz, T.J., Smith, S.W., and Zimmerman, D.C., "Structural Health Monitoring of Large Structures," *Sound and Vibration*, April, 1995, Acoustical Publications, Inc.

1.6.4 Government Publications

43. Pappa, R.S., James III, G.H., and Zimmerman, D.C., "Autonomous Modal Identification of the Space Shuttle Tail Rudder," NASA LaRC Technical Memorandum 112866, June 1997.

1.6.5 Proceedings - invited by session organizer

44. Inman, D.J., Mayne, R.W., and Zimmerman, D.C., "Comments on Electromechanical Actuators for Controlling Flexible Structures," Proceedings of the Fifth AFOSR Forum on Space Structures, Monterey, California, August 1987.
45. Zimmerman, D.C., and Inman, D.J., "Actuator/Structure Interaction," Proceedings of the 2nd NASA/DOD Controls Structure Interaction Technology Conference, Colorado Springs, Colorado, November 1987, pp. 376-387.
46. Taylor, L.W. Jr., and Zimmerman, D.C., "PDEMODO - Software for Controls-Structure Optimization," Proceedings of the 4th NASA Workshop on Computational Control of Flexible Aerospace Systems, Williamsburg, VA, July 11-13, 1990.
47. Zimmerman, D.C., and Rhoads, C., "Neural Network Implementation of the Low Authority - Threshold Control Technique," Society of Experimental Mechanics Spring Conference, Milwaukee, WI, June 10-13, 1991.

48. Leigh, T. and Zimmerman, D.C., "An Implicit Method for the Nonlinear Modelling and Simulation of Piezoceramic Actuators Displaying Hysteresis," ASME Winter Annual Meeting, Atlanta, Georgia, December 1991.
49. James, G., Zimmerman, D.C., and Cao, T., "Development of a Coupled Approach for Structural Damage Detection," Proceedings of the 35 Aerospace Sciences Meeting & Exhibit, Reno, NV, January 1997, AIAA Paper No. 97-0362.
50. Cao, T.T. and Zimmerman, D.C., "Effects of Noise on Measured Ritz Vectors", 1997 ASME Design Engineering Technical Conferences, ASME Paper DETC97/VIB-4230.
51. Pappa, R.S., James III, G.H., and Zimmerman, D.C., "Autonomous Modal Identification of the Space Shuttle Tail Rudder," ASME Paper DETC97/VIB-4250.
52. Smith, S.W., Zimmerman, D.C., Bartkowicz, T.J., and Kim, H.-M., "Experiments for Damage Location in a Damped Structure," ASME Paper DETC97/VIB-4231.
53. Zimmerman, D.C. and James, G.H. III, "Statistical Confidence Using Minimum Rank Perturbation Theory," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp.
54. Zimmerman, D.C., James, G.H. and Cao, T.T., "Recent Structural Health Monitoring Technologies with Spacecraft Component Experimental Validation," Proceeding of the SEM Spring Meeting, Houston, TX, June 1998, pp. 114-117
55. Abdalla, M., Zimmerman, D.C., and Grigoriadis, K.M., "Structural Damage Detection Using Strain Data via Linear Matrix Inequality Methods, Proceedings of the 1999 American Controls Conference, San Diego, CA.
56. Zimmerman, D.C., "Navigating Expensive and Complex Design Spaces Using Genetic Algorithms," Proceedings of the ASME DETC'99, September 1999, Las Vegas, NV, DETC99-816.

1.6.6 Proceedings - Full Paper Review

57. Zimmerman, D.C., "Threshold Control for Nonlinear and Time-Varying Mechanical Systems," 1989 ASME Design Technical Conference - Failure Prevention, Reliability and Stress Analysis, Vol. H00506, Montreal, Canada, November 1989.
58. Zimmerman, D.C., and Maddahian, A., "Quadratic Tuning of Proof-Mass Actuators," Proceedings of the 1990 ASME International Computers in Engineering Conference and Exposition, Boston, Mass., August 5-9, 1990.
59. Zimmerman, D.C., "A Darwinian Approach to the Actuator Number and Placement Problem with Nonnegligible Actuator Mass," Proceedings of the 13th Biennial ASME Conference on Mechanical Vibrations and Noise, Miami Florida, September 1991.
60. Abdalla, M., Zimmerman, D.C., and Grigoriadis, K.M., "Reduced Parameter Update in Structural Systems Using LMIs," *Proceedings of the 2000 American Control Conference*, Chicago, Illinois, 2000.

1.6.7 Proceedings - Abstract Review

61. Zimmerman, D.C., Inman, D.J., and Juang, J.-N., "Vibration Suppression Using a Constrained Rate-Feedback - Threshold Control Strategy," Proceedings of the 28th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, Monterey, California, April 1987, pp. 125-134.
62. Zimmerman, D.C., Inman, D.J., and Juang, J.-N., "Low-Authority - Threshold Control for Large Flexible Structures," Proceedings of the AIAA/ASME/ASCE/AHS 29th Structures, Structural Dynamics, and Materials Conference, Williamsburg, VA, April, 1988, pp. 459-469.

63. Zimmerman, D.C. and Widengren, M., "Model Correction Using a Symmetric Eigenstructure Assignment Technique," Proceedings of the 30th Structures, Structural Dynamics, and Materials Conference, Mobile, AL, April 1989, pp. 1947-1954.
64. Zimmerman, D.C., "Structure/Control Synthesis with Nonnegligible Actuator Mass," Proceedings of the 31st Structures, Structural Dynamics, and Materials Conference, Long Beach, CA, April 2-4, 1990, pp. 241-246.
65. Zimmerman, D.C., and Delphenich, D., "Pulse Control of Simple Mechanical Systems Using Proof-Mass Actuators, Proceedings of the AIAA 32nd SDM Conference, Baltimore, MD, April 8-10, 1991, pp. 2137-2145.
66. Zimmerman, D.C., and Lyde, T.L., "Sensor Failure Detection and Isolation in Flexible Structures Using the Eigensystem Realization Algorithm," 33rd AIAA Structures, Structural Dynamics and Materials Conference, Dallas, Texas, April 1992
67. Zimmerman, D.C., and Kaouk, M., "Structural Damage Detection Using a Subspace Rotation Algorithm," 33rd AIAA Structures, Structural Dynamics and Materials Conference, Dallas, Texas, April 1992.
68. Kaouk, M., and Zimmerman, D.C., "Structural Damage Assessment Using a Generalized Minimum Rank Perturbation Theory," Proceedings of the 34th AIAA Structures, Structural Dynamics and Materials Conference, LaJolla, CA, April 1993, pp. 1529-1538.
69. Zimmerman, D.C., and Layton, D.S., "Large Angle Slewing Maneuvers Using Performance Driven Darwinian Learning Controllers: Theory and Experiment," Proceedings of the 34th AIAA Structures, Structural Dynamics and Materials Conference, LaJolla, CA, April 1993, pp. 3540-3550.
70. Zimmerman, D.C., Smith, S.W., Kim, H.-M., and Bartkowicz, T., "An Experimental Study Of Structural Damage Detection Using Incomplete Measurements," Proceedings of the AIAA Dynamic Specialists Conference, April, 1994, Hilton Head, SC, pp. 307-317.
71. Larson, C.B., Zimmerman, D.C., and Marek, E.L., "A Comparative Study of Metrics for Modal Pre-Test Sensor and Actuator Selection," Proceedings of the AIAA Dynamic Specialists Conference, April, 1994, Hilton Head, SC, pp. 150-163.⁴
72. Zimmerman, D.C., and Simmermacher, T., "Model Refinement and System Health Monitoring Using Data From Multiple Static Loads and Vibration Tests," Proceedings of the AIAA Dynamic Specialists Conference, April, 1994, Hilton Head, SC, pp. 325-335.
73. Simmermacher, T., Mayne, R. and Zimmerman, D.C., "Large Angle Slewing Maneuvers via $H-\infty$ Control," Proceedings of the 35th AIAA Structures, Structural Dynamics and Materials Conference, April, 1994, Hilton Head, SC, pp. 1910-1914.
74. Sugavanam, S., and Zimmerman, D.C., "Asymptotic Observer Design Using Backpropagation Through Time," Proceedings of the 35th AIAA Structures, Structural Dynamics and Materials Conference, April, 1994, Hilton Head, SC, pp. 2479-2486.
75. Simmermacher, T., Zimmerman, D.C., Mayes, R., Reese, G., and James, G., "The Effects of Finite Element Grid Density on Model Correlation and Damage Detection of a Bridge," Proceedings of the 36th AIAA Structures, Structural Dynamics and Materials Conference, New Orleans, LA, April, 1995, pp. 2249-2258.
76. Kaouk, M., and Zimmerman, D.C., "Reducing the Required Number of Modes for Structural Damage Assessment," Proceedings of the 36th AIAA Structures, Structural Dynamics and Materials Conference, New Orleans, LA, April, 1995, pp. 2802-2812.
77. Zimmerman, D.C., Simmermacher, T., and Kaouk, M., "Model Correlation And System Health Monitoring Using Frequency Domain Measurements," Proceedings of the AIAA/ASME Adaptive Structures Forum, New Orleans, LA, April, 1995, pp. 3318-3326.

4. *awarded 1994 AIAA Dynamic Specialist Conference Best Paper Award*

78. Santos, J.M.C.D., and Zimmerman, D.C., "Damage Detection Using Minimum Rank Update Theory and Parameter Estimation," Proceedings of the AIAA/ASME Adaptive Structures Forum, April, 1996, Salt Lake City, UT, pp. 168-175.
79. Bartkowicz, T.J., Kim, H.-M., Zimmerman, D.C., and Smith, S.W., "Autonomous Structural Health Monitoring System: A Demonstration," Proceedings of the 37th AIAA Structures, Structural Dynamics and Materials Conference, April, 1996, Salt Lake City, UT, pp. 1758-1764.
80. Zimmerman, D.C., Kim, H.M, Bartkowicz, T.J., and Kaouk, M., "Damage Detection Using Expanded Dynamic Residuals," AIAA Structures, Structural Dynamics and Materials Conference, April 1998, proceedings to be published.
81. Zimmerman, D.C., Inman, D.J., and Horner, G.C., "Dynamic Characterization and Microprocessor Control of the NASA-UVA Proof-Mass Actuator," Proceedings of the 25th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials, and Dynamics Specialists Conferences, Palm Springs, California, May 1984, pp. 573 - 577.
82. Zimmerman, D.C., Horner, G.C., and Inman, D.J., "Microprocessor Controlled Force Actuator," Proceedings of the 27th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, San Antonio, Texas, May 1986, pp. 243-251.
83. Zimmerman, D.C., and Cudney, H.H, "Practical Implementation Issues for Active Control of Large Flexible Structures," Proceedings of the 6th VPI&SU/AIAA Symposium on the Dynamics and Control of Large Structures, Blacksburg, Virginia, June 1987, pp. 275-290.
84. Zimmerman, D.C., and Inman, D.J., "Threshold Control for Simple Mechanical Systems," Collection of abstracts of papers presented at the 7th ASCE Engineering Mechanics Division Specialty Conference, Blacksburg, VA, May, 1988, pp. 85.
85. Zimmerman, D.C., and Widengren, M., "Equivalence Relations for Model Correction of Nonproportionally Damped Linear Systems," Proceedings of the 7th VPI&SU/AIAA Symposium on Dynamics and Control of Large Structures, Blacksburg, VA, May 1989, pp. 523-538.
86. Zimmerman, D.C., and Kaouk, M., "Model Refinement/Damage Detection Using Measured Test Data," Proceedings of the 4th NASA/DOD CSI Technology Conference, Orlando, FL November 5-7, 1990, pp. 87-100.
87. Zimmerman, D.C. and Kaouk, M., "An Inverse Problem Approach For Structural Damage Detection - Finite Element Model Refinement" Proceedings of the 8th VPI&SU Symposium on Dynamics and Control of Large Structures, May 6-8, 1991, Blacksburg, VA, pp. 181-192.
88. Zimmerman, D.C., "A Darwinian Approach to Control-Structure Design," Proceedings of the Fifth Annual NASA/DOD Controls-Structures Interaction Technology Conference, Lake Tahoe, Nevada, March 1992, pp. 303-314
89. Weaver Smith, S., and Zimmerman, D.C., "A Comparison of Refined Models for Flexible Subassemblies," Proceedings of the Fifth Annual NASA/DOD Controls-Structures Interaction Technology Conference, Lake Tahoe, Nevada, March 1992, pp. 215-230.
90. Maben, E. and Zimmerman, D.C., "Advances in Parameter Estimation Techniques Applied to Flexible Structures," NASA Workshop on Distributed Parameter Modelling and Control of Flexible Aerospace Systems, Williamsburg, VA, June 8-10, 1992, pp. 215-239 (published as NASA Conference Publication 3242, June 1994).
91. Rhoades, C. and Zimmerman, D.C., "Neural Network Low Authority Threshold Control of Linear and Nonlinear Mechanical Systems: Theory and Experiment," Proceedings of the SPIE Smart Structures and Materials '93 Conference, Feb 1993, Albuquerque, NM.
92. Larson, C., and Zimmerman, D.C., "On the Use of Genetic Algorithms in Structural Damage Detection," Proceedings of the 11th International Modal Analysis Conference, Feb, 1993, Orlando, FL, pp. 1083-1094.

93. Kaouk, M., and Zimmerman, D.C., "Evaluation of the Minimum Rank Update in Damage Detection: An Experimental Study," Proceedings of the 11th International Modal Analysis Conference, Feb, 1993, Orlando, FL, pp. 1061-1068.
94. Zimmerman, D.C., "Model Refinement of the Harris Multi-Hex Prototype Structure: Experimental Results," Proceedings of the 11th International Modal Analysis Conference, Feb, 1993, Orlando, FL, pp. 696-702.
95. Kaouk, M. and Zimmerman, D.C., "Simultaneous Damage Extent Evaluation of Mass, Damping and Stiffness Properties Using a Minimum Rank Update Theory", Proceeding of the 9th VPI&SU Symposium on Dynamics and Control of Large Structures, Blacksburg, VA, pp. 445-456.
96. Leath, W.J. and Zimmerman, D.C., "Analysis of Neural Network Supervised Training with Application to Structural Damage Detection", Proceeding of the 9th VPI&SU Symposium on Dynamics and Control of Large Structures, Blacksburg, VA, 1993, pp. 583-594.
97. Smith, S.W, Baker, J.R., Kaouk, M, and Zimmerman, D.C., "Mode Shape Expansion for Visualization and Model Correlation," Proceeding of the 9th VPI&SU Symposium on Dynamics and Control of Large Structures, Blacksburg, VA, pp. 385-396.
98. Zimmerman, D.C., Simmermacher, T, and Kaouk, M., "Multiple Configuration - Test Procedures for the Correlation of Structural Models," Proceedings of the 12 International Modal Analysis Conference, Jan-Feb 1994, Honolulu, HA, pp. 474-480.
99. Kaouk, M., and Zimmerman, D.C., "Structural Damage Detection Using Measured Modal Data And *No* Original Analytical Model," Proceedings of the 12 International Modal Analysis Conference, Jan-Feb 1994, Honolulu, HA, pp. 731-737.
100. Larson, C.B., Zimmerman, D.C., and Marek, E.L., "A Comparison of Vibration Test Planning for Model Refinement and Damage Detection," Proceedings of the 12 International Modal Analysis Conference, Jan-Feb 1994, Honolulu, HA, pp. 205-211.
101. Kim, H.-M., Bartkowicz, T.J., Smith, S.W., and Zimmerman, D.C, "Structural Health Monitoring of Large Structures," NASA Conference Publication 3263, Proceedings of the Dual-Use Space Technology Transfer Conference and Exhibition," February 1-4, 1994, NASA JSC Gilruth Center, Houston, TX, pp. 314-318.
102. Zimmerman, D.C., Simmermacher, T., and Kaouk, M., "On the Role of Engineering Insight & Judgement in Structural Damage Detection," 13th International Modal Analysis Conference, Feb. 1995, Nashville, TN, pp. 179-184.
103. Zimmerman, D.C., and Kaouk, M., and Simmermacher, T., "Structural Damage Detection Using Frequency Response Functions", 13th International Modal Analysis Conference, Feb. 1995, Nashville, TN, pp. 414-420.
104. Kaouk, M., and Zimmerman, D.C., "Structural Health Assessment Using A Partition Model Update Technique," 13th International Modal Analysis Conference, Feb. 1995, Nashville, TN, pp. 1673-1679.
105. Gafka, G. and Zimmerman, D.C., "Structural Damage Detection via Least Squares Dynamic Residual Force Minimization with Quadratic Measurement Error Inequality Constraint," Proceedings of the 14th International Modal Analysis Conference, Feb. 1996, Dearborn, MI, pp. 1278-1284.
106. Santos, J.M.C.D., and Zimmerman, D.C., "Damage Detection in Complex Structures Using Component Mode Synthesis and Residual Modal Force Vectors," Proceedings of the 14th International Modal Analysis Conference, Feb. 1996, Dearborn, MI, pp. 1299-1305.
107. Zimmerman, D.C., Smith, S.W., Kim, H.-M., and Bartkowicz, T.J., "Spacecraft Applications for Damage Detection Using Vibration Testing," Proceedings of the 14th International Modal Analysis Conference, Feb. 1996, Dearborn, MI, pp. 851-856.
108. Cao, T., and Zimmerman, D.C., "Application of Load Dependent Ritz Vectors in Structural Damage Detection," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1319-1324.

109. Cao, T., and Zimmerman, D.C., "A Procedure to Extract Ritz Vectors from Dynamic Testing Data," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1036-1042.
110. Simmermacher, T. and Zimmerman, D.C., "Model Refinement and Damage Detection Using Nearfield Acoustic Holography" 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1758-1764.
111. Simmermacher, T., Kaouk, M., and Zimmerman, D.C., "Exploiting Aliasing Effects in the Eigensystem Realization Algorithm," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 50-63.
112. Zimmerman, D.C., Yap, C.K., and Hasselman, T., "Evolutionary Approach for Model Correlation," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 551-557.
113. Abdallah, M., Grigoriadis, K., and Zimmerman, D.C., "Enhanced Damage Detection Using Alternating Projections," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1325-1331.
114. Smith, S.W., Zimmerman, D.C., Kim, H.-M., and Bartkiewicz, T.J., "Damage Detection in Damped Structures," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1096-1102.
115. James, G., Zimmerman, D.C., and Simmermacher, T.W., "Reduction/Expansion Studies for Damage Identification of Continuous Aerospace Structures," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1772-1778.
116. James, G., Zimmerman, D.C., and James, G., "Utilization of Large Experimental/Analytical Data Sets for Structural Health Monitoring of Aerospace Structures," 15th International Modal Analysis Conference, Orlando, FL, Feb. 1997, pp. 1765-1771.
117. James, George H., Zimmerman, D.C., and Grygier, M., "An Experimental Database for Model Correlation and Damage Detection Studies Based on the Space Shuttle Vertical Stabilizer Assembly (VSA) Test Article," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 1264-1270.
118. James, George H., Zimmerman, D.C., and Mayes, R.L., "An Experimental Study of Frequency Response Function (FRF) Based Damage Assessment Tools," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 151-157
119. Cao, T.T., Zimmerman, D.C., and James, G., "Identification of Ritz Vectors From Ambient Test Data," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 1609-1614.
120. Yap, Keng C. and Zimmerman, D.C., "A Comparison of Structural Dynamic Modification and Sensitivity Method Approximations," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 1409-1415.
121. Yap, Keng C. and Zimmerman, D.C., "The Effect of Coding in Genetic Algorithm Based Structural Damage Detection," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 165-171.
122. Abdalla, M.O., Grigoriadis, K., and Zimmerman, D.C., "Enhanced Damage Detection Using Linear Matrix Inequalities (LMI's)," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 144-150.
123. Smith, S.W., Eckert, J.C., and Zimmerman, D.C., "Zero-Gravity Damage Evaluation (Z-GraDE)," Proceedings of the SEM International Modal Analysis Conference XVI, Santa Barbara, CA, Feb. 1998, pp. 158-164.
124. Hasselman, H., Anderson, M., and Zimmerman, D.C., "Fast Running Approximations of High Fidelity Physics Models," 69th Shock and Vibration Symposium, Minneapolis/St. Paul, MN, October 12-16, 1998

125. Herendeen, D., Woo, L., Hasselman, T., and Zimmerman, D.C., "Analysis Test Correlation and Model Updating of Dynamic Systems Using MDO Software Tools," 1998 AIAA Multi-Disciplinary Optimization Conference, Panama City, FL.
126. Cao, T.T., Zimmerman, D.C., and James, G.H., "Identification of Ritz Vectors From the Space Shuttle Vertical Stabilizer Assembly Test Article," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 2005-2010.
127. Lopez, F., and Zimmerman, D.C., "A Pattern Recognition Approach for Damage Localization Using Incomplete Measurements," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 579-585.
128. Zimmerman, D.C., James, G.H., and Cao, T.T., "An Experimental Study of Damage Detection Using Modal, Strain, and Ritz Properties," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 586-592.
129. Chhipwadia, K.S., Zimmerman, D.C., and James, G.H., "Evolving Autonomous Modal Parameter Extraction," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 819-825.
130. James, G.H., Zimmerman, D.C., and Chhipwadia, K.S., "Application of Autonomous Modal Identification to Traditional and Ambient Data Sets," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 840-845.
131. Yap, K.C., and Zimmerman, D.C., "Damage Detection of Gyroscopic Systems Using an Asymmetric Minimum Rank Perturbation Theory," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 1366-1372.
132. Abdalla, M., Grigoriadis, K.M., and Zimmerman, D.C., "Experimental Validation of the LMI Methods for Structural Damage Detection," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 1373-1379.
133. Zimmerman, D.C., Hasselman, T., and Anderson, M., "Approximation and Identification of Nonlinear Structural Dynamics," Proceedings of the SEM International Modal Analysis Conference XVII, Orlando, FL, Feb. 1999, pp. 1518-1524.
134. Zimmerman, D.C., "Model Validation and Verification of Large and Complex Space Structures," Proceedings of the 2nd International Conference on Identification in Engineering Systems, Wales, Swansea, March 1999, pp. 18-32.⁵
135. Hasselman, T.K., Zimmerman, D.C., and Herendeen, D.L., "An Integrated FEA Software Capability For Dynamic Model Validation and Verification, Proceedings of the 40th AIAA Structures, Structural Dynamics and Materials Conference, St. Louis, MO, April 1999, AIAA Paper No. 99-1595.
136. Zimmerman, D.C., "Looking Into the Crystal Ball: The Continued Need for Engineering Judgement in Damage Detection", Proceedings of the Euromech International Workshop: DAMAS 99 - Structural Damage Assessment Using Advanced Signal Processing Procedures, July 1999, Dublin, Ireland, pp. 15-29.⁶
137. Lopez, F.P. and Zimmerman, D.C., "Stiffness Perturbation Analysis of Reduced Models," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 1232-1236
138. Yap, K.C. and Zimmerman, D.C., "Dynamic Least Square Parameter Estimation of Structures," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 1513-1519.

5. *Keynote Paper/Presentation*

6. *Keynote Paper/Presentation*

139. Hasselman, T.K., Coppelino, R., and Zimmerman, D.C., "Criteria for Modeling Accuracy: A State-of-the-Practice Survey," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 335-341,
140. Yap, K.C., and Zimmerman, D.C., "Optimal Sensor Placement for Dynamic Model Correlation," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 607-612.
141. Lopez, F.P., and Zimmerman, D.C., "Evaluation of Reduced Models for Damage Localization Using Subspace Recognition," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 1200-1206.
142. James, G.H., Zimmerman, D.C., Cao, T.T., and Lopez, F., "Model-Based Damage Detection of the Space Shuttle VSA Data Set," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 1213-1217.
143. Abdalla, M., Grigoriadis, K., and Zimmerman, D., "LMI Hybrid Expansion Reduction Damage Detection Method," Proceeding of the 18th SEM International Modal Analysis Conference, Feb. 2000, San Antonio, TX, pp. 1537-1542.
144. Yap, K.C., and Zimmerman, D.C., "A Comparison of Modal Data Matching and Dynamic Residual Optimization in Structural Damage Detection," Proceedings of the 13th International Congress on Condition Monitoring and Diagnostic Engineering Management, Houston, TX, December 2000 pp. 329-338.
145. Boxeon, T, and Zimmerman, D.C., "Advances in Ritz Vector Testing," Proceeding of the 19th SEM International Modal Analysis Conference, Feb. 2001, Kissimmee, FL.
146. Zimmerman, D.C., and Hemez, F.M., "Model Validation: From Research to Industry?," Proceeding of the 19th SEM International Modal Analysis Conference, Feb. 2001, Kissimmee, FL.
147. Lopez, F, and Zimmerman, D.C., "Nonlinear Damage Detection Using a Time-Domain Minimum Rank Perturbation Theory," SPIE Nondestructive Evaluation for Health Monitoring of Structural and Biological Systems, San Diego, CA, March 18-20, 2002, Vol. 4702, pp. 179-190.
148. Jeancolas, H, and Zimmerman, D.C., "Improving the Accuracy of Measured Ritz Vectors," SEM International Modal Analysis Conference," Los Angeles, CA, February 2002.
149. Lopez, F., and Zimmerman, D.C., "Stiffness Tracking Using a Time-Domain Minimum Rank Perturbation Theory," Proceedings of the SEM International Modal Analysis Conference," Los Angeles, CA, February 2002.
150. Lopez, F., and Zimmerman, D.C., "Nonlinear Damage Tracking Using a Minimum Rank Secant Stiffness Estimation," Proceedings of the SEM International Modal Analysis Conference, Kissimmee, FL, February 2003, Paper #150.
151. Zimmerman, D.C. and Jorgensen, S.S.F, "Parallel Multi-Species Genetic Algorithm for Parameter Estimation in Structural Dynamics," Proceedings of the SEM International Modal Analysis Conference, January 2004, Dearborn, MI., Paper # 384.
152. Mallick, S., and Zimmerman, D.C., "Multi-Axis Vibration Isolation of Sensitive Electronics in Police Trunks," Proceedings of the SEM International Modal Analysis Conference, February 2005, Orlando, FL, Paper #290
153. Taylor, S, and Zimmerman, D.C., "Damage Detection in a Cargo Bay Frame Using Ritz Vectors," Proceedings of the SEM International Modal Analysis Conference, February 2005, Orlando, FL, Paper #355
154. Link, R.J. and Zimmerman, D.C., "An Approach for Model Updating of a Multi-Physics MEMs Micromirror," Proceedings of the SEM International Modal Analysis Conference, February 2005, Orlando, FL, Paper #279

155. Zimin, V., and Zimmerman, D.C., "Structural Damage Detection Using Time Domain Periodogram Analysis," Proceedings of the SEM International Modal Analysis Conference, February, 2006, St. Louis, MO, Paper #218.

1.7 PRESENTATIONS

All proceedings and conference papers listed in prior sections have an associated conference presentation. I believe that part of graduate education is the experience of organizing and summarizing research results in the form of conference presentations. Therefore, I have asked my students to present 36 of the above listed conference papers.

1.7.1 Workshop/Symposium Presentations

1. Zimmerman, D.C., and Inman, D.J., "Actuator/Structure Interaction," Colorado Springs, Colorado, November 1987.
2. Zimmerman, D.C., "Structural Dynamics and Control at the University of Florida," Orlando, Florida, February, 1989 (Florida Space Research and Development Workshop - poster presentation)
3. Zimmerman, D.C., "Space Structure and Space Robotics: An Overview," Orlando, Florida, February, 1989 (Florida Space Research and Development Workshop - invited presentation)
4. Zimmerman, D.C., "In-Space Performance Prediction: What New Tools are Needed?," Melbourne, Florida, April 1989 (7th Annual Air Force Forum on Space Structures - invited presentation).
5. Zimmerman, D.C., "Hardware Reliability Issues for Large Space Systems Control," Melbourne, Florida, April 1989 (7th Annual Air Force Forum on Space Structures - invited presentation).
6. Zimmerman, D.C., "Recent Advances in Structural Model Validation and Health Monitoring: Theory and Experiment," Space Station Freedom On-Orbit Structural Verification Workshop, Space Station Freedom Office, Reston, VA, December 14-15, 1992.
7. Zimmerman, D.C. and Simmermacher, T., "Precision Modeling and Structural Health Monitoring," AIAA Houston 19th Annual Technical Symposium, May, 1994, University of Houston-Clear Lake, Houston, TX.
8. Zimmerman, D.C. and C.B. Larson, "Genetic Algorithm Techniques for Structural Dynamic Applications," AIAA Houston 19th Annual Technical Symposium, May, 1994, University of Houston-Clear Lake, Houston, TX.⁷
9. Zimmerman, D.C., "Genetic Algorithms for Navigating Expensive and Complex Design Spaces," 1995 Texas Systems Day, Oct, 1995, Houston, TX.
10. Zimmerman, D.C., James, G.H., and Cao, T.T., "Recent Structural Health Monitoring Technologies with Spacecraft Component Experimental Validation," SEM Spring Meeting, Houston, TX, June 1998 (a special two hour presentation allocated by the SEM Spring Meeting Organizers).
11. Zimmerman, D.C., "Institute for Intelligent Bio-Nano Materials and Structures," Nanospace 2002, Galveston, TX, June, 2002.
12. Zimmerman, D.C., "Institute for Intelligent Bio-Nano Materials and Structures," Texas Nano-Vivo Summit, Houston, TX, August, 2002.
13. Zimmerman, D.C., "Application of Intelligent Systems in Biomedical Engineering," Joint UK/Texas Symposium: Tissue Engineering and Regenerative Medicine," March 29-30, 2004, Imperial College, London, UK.

7. *Best Paper Presentation Award, Session 13 -- Structural Analysis*

14. Zimmerman, D.C., Structural Health Monitoring Case Studies: Analysis Aided with Engineering Insight, 58th Machinery Failure Prevention Technology Conference, April, 26-29, 2004, Virginia Beach, VA.⁸

1.7.2 University, Government and Industrial:

15. Seminars on the topic “Low-Authority - Threshold Control of Large Space Structures” presented at:
Princeton University, March 1987
University of Florida, March 1987
University of Massachusetts at Amherst, March 1987
University of Notre Dame, February 1987
Virginia Polytechnic Institute & State University, January 1987
Vanderbilt University, January 1987
Drexel University, December 1986
16. “Overview of Large Space Structure Technology,” University of Florida, September, 1987.
17. “Control/Structure/Actuator Interaction: Theory and Experiment,” Harris Corporation, Melbourne, Florida, October, 1988.
18. “Correcting Finite Element Models Using a Symmetric Eigenstructure Assignment Technique,” University of Florida, February, 1989.
19. “Model Correction Using a Symmetric Eigenstructure Assignment Technique,” State University of New York at Buffalo, February, 1989.
20. “Simultaneous Structure/Control Synthesis with Nonnegligible Actuator Mass,” NASA Langley Research Center (ASEE final program), August, 1989.
21. “Some Recent Advances in the Symmetric Eigenstructure Assignment Technique”, Florida Institute of Technology, December, 1989.
22. “Dynamics and Control of Large Space Structures,” University of Colorado at Boulder, March, 1990.
23. “A Genetic Approach to the Actuator Number and Placement Problem with Nonnegligible Actuator Mass,” NASA Langley Research Center, August, 1990.
24. “A Genetic Approach to the Actuator Number and Placement Problem with Nonnegligible Actuator Mass,” University of Florida, September, 1990.
25. “A Darwinian Approach to Design Optimization: Application to Actuator Placement and Structural Design,” Virginia Polytechnic Institute and State University, October 1990.
26. “Evolutionary Based Optimization: Application to Control/Structure Interaction Theory,” University of Kentucky, February, 1991.
27. “Finite Element Model Adjustment/Damage Detection Using Measured Test Data,” Florida High Technology Industry Council Computer Integrated Engineering & Manufacturing Technology Transfer Forum, Orlando, FL, June, 1991.
28. “Finite Element Model Refinement with Application to the Harris Multi-Hex Prototype Experiment Facility,” Harris Corporation, Melbourne, FL, June 1991.
29. “The Dynamic System and Control Laboratory,” Dynacs Engineering, Clearwater, FL, November, 1991.
30. “Structural Model Refinement and Damage Detection,” Rennsalaer Polytechnic Institute, Troy, New York, February 1992.
31. “Structural Health Monitoring,” University of Florida, Gainesville, FL, February, 1992.

8. *Invited Speaker, opening session*

32. "Nondestructive Structural Health Monitoring and Model Validation Using Measured Vibration Data: Theory & Experiment," University of Houston, Houston, TX, March, 1993
33. "Nondestructive Damage Detection of Offshore Structures," Shell Oil Research Laboratories, Houston, TX, March, 1993.
34. "Model Refinement and Damage Assessment With Measured Modal Data," (with S.W. Smith, U. of Kentucky," NASA Johnson Space Center, Houston, TX, March 1993
35. "Nondestructive Structural Health Monitoring and Model Validation Using Measured Vibration Data: Theory & Experiment," University of Wisconsin, Madison, WI, March, 1993.
36. "An Overview of Genetic Algorithms with Engineering Optimization Applications," Sandia National Laboratories, Albuquerque, NM, September 1993
37. "Advanced Concepts in Genetic Algorithms," Sandia National Laboratories, Albuquerque, NM, September 1993
38. "Control Design With Genetic Algorithms," NASA JSC Guidance and Control Lunch and Learn Seminar Series, Webster, TX, December 1993.
39. "Optimization with Genetic Algorithms," Sandia National Laboratories, Albuquerque, NM, October, 1994.
40. "Structural Health Monitoring and Identification," Sandia National Laboratory Offshore Oil Industry Information Meeting, Albuquerque, NM, July 1995
41. "Coping with Reduced Models and Sensors in Structural Damage Detection," Los Alamos National Laboratory Damage Identification Workshop, September, 1995.
42. "Genetic Algorithms for Navigating Expensive and Complex Design Spaces," Sandia National Laboratories, Albuquerque, NM, September 1995
43. "A Hands-On Demonstration of an Autonomous Structural Health Monitoring Systems," McDonnell Douglas Aerospace, Houston, TX, November, 1995.
44. "Frequency Response Function (FRF) Based Damage Detection," McDonnell Douglas Aerospace, Houston, TX, September, 1996.
45. "Model Refinement and Damage Assessment with Measured Modal Data," University of Texas at Austin, Department of Aerospace Engineering, November 1996
46. "Genetic Algorithms and Neural Network Function Approximations", Sandia National Laboratories, Albuquerque, NM, November 1996.
47. "Genetic Algorithms and Their Use in Coarse Structural Dynamic Model Correlation," NASA Johnson Space Center, Houston, TX February 1997.
48. "Identification and Uses of Ritz Vectors in Structural Damage Detection," NASA Johnson Space Center, Houston, TX February 1997.
49. "Uses of Minimum Rank Perturbation Theory in Structural Damage Detection", University of Franche-Comte, Laboratoire de Mecanique Appliquee R. Chaleat, FRANCE, May 1997.
50. "Extensions of Minimum Rank Perturbation Theory", University of Franche-Comte, Laboratoire de Mecanique Appliquee R. Chaleat, FRANCE, May 1997.
51. "Identification and Application of Experimental Ritz Vectors", University of Franche-Comte, Laboratoire de Mecanique Appliquee R. Chaleat, FRANCE, May 1997.
52. "(R)evolutionary Optimization With No Theory", University of Franche-Comte, Laboratoire de Mecanique Appliquee R. Chaleat, FRANCE, June 1997.
53. "Genetic Algorithms for Navigating Expensive and Complex Design Spaces", University of Franche-Comte, Laboratoire de Mecanique Appliquee R. Chaleat, FRANCE, June 1997.

54. "Model Error Localization and Parameter Updating Using Genetic Algorithms," Universitat Gesamthochschule, Kassel, GERMANY, June 1997.
55. "Automated Modal Test Parameter Extraction," NASA Shuttle Program Technical Interchange Meeting, JSC, Houston, TX November 1998.
56. "Model Correlation Techniques Using UAI/NASTRAN," NASA Shuttle Program Technical Interchange Meeting, JSC, Houston, TX November 1998.
57. "Ritz Vectors: Experimental Measurement and Their Uses in Structural Damage Detection," University of Oklahoma, Norman, OK, April, 1999.
58. "Model Validation and Verification of Complex Structures," University of Maryland, College Park, MD, May, 1999.
59. "Autonomous Condition Based Performance for Advanced Systems," DARPA, Arlington, VA, November 1999.
60. Automated Tools for Model Correlation and Modal Parameter Extraction," NASA Shuttle Program Technical Interchange Meeting, GSFC, November 1999.
61. "On the Experimental Measurement of Structural Ritz Vectors," University of Florida, Gainesville, FL, December 1999.
62. "Ritz Vector Measurement and Application," Rice University, Houston, TX, January, 2000.
63. "Autonomous Condition Based Performance for Advanced Systems," Sandia National Laboratory, Albuquerque, NM, June 2000.
64. "Model Validation and Verification of Large and Complex Space Structures," Los Alamos National Laboratory, NM, June 2000.
65. "Genetic Algorithms for Navigating Expensive and Complex Design Spaces," Los Alamos National Laboratory, NM, June 2000.
66. "Zero-Gravity Flight Experiments," Los Alamos National Laboratory, Los Alamos, NM, June, 2002.
67. "Institute for Intelligent Bio-Nano Materials and Structures," NASA Johnson Space Center, Houston, TX, August, 2002.
68. "Advances in Ritz Vector Measurement with Applications to Structural Damage Detection," Texas A&M, February, 2003
69. "A Genetic Algorithm Approach for Vibration-Based Model Refinement and Damage Detection of Structures using Structural Approximations, Rice University, April 2003.
70. "Advances in Ritz Vector Measurement with Applications to Structural Damage Detection," Purdue University, April 2003.
71. "Intelligent Systems Research Program: Year 1 Summary," NASA Langley Research Center, August, 2003
72. "Intelligent Systems Research Program", NASA Langley Research Center, February, 2004.
73. "Intelligent Systems Research Program - Mid Year 3 Review, " NASA Langley Research Center, February, 2005
74. "Can we Really Predict the Future," The Future of HUMS within Defence Maintenance, London, UK, December , 2005

1.8 GRANTS AND CONTRACTS

1. National Aeronautics and Space Administration (NASA Langley Research Center), "Actuator Control Research", May 1983 - May 1987, \$66,000 (with D. Inman (Co-PI)).

2. Lenzar Optics Corporation, "Consulting Services for the Lenzar TV Sensor System," February, 1988, \$7,500 (with D. Jenkins (PI) and M. Eisenberg).
3. National Science Foundation, "Engineering Research Equipment Grant: Real-Time Active Control and Modal Test System," June, 1988, \$69,904 (with P. Hajela (Co-PI)).
4. National Science Foundation, "Undergraduate Instrumentation and Laboratory Improvement: Aerospace Design Workstations," November, 1988, \$146,532 (with B. Leadon (PI), H. Doddington, P. Hajela, B. Hirko).
5. MODCOMP Inc., "Classic 32/85 for the Dynamic Systems and Control Laboratory," November 1988, \$48,718.
6. Florida Technological Research and Development Authority, "Sensing and Control Technologies for Closed-Loop Life Support Systems," March, 1989, \$90,000 (with H. Doddington and G. Nevill).
7. NASA/ASEE Summer Faculty Fellowship Program, June-August, 1989, \$8,000.
8. NASA Langley Research Center, "Sensor/Actuator Dynamics in the Active Control of Flexible Structures," August 11, 1989 - August 10, 1991, \$124,934.
9. Nanoptics Incorporated, "Vibration Isolation of a Proton Microscope," October 1989, \$1000.
10. Florida High Technology and Industry Council, "Finite Element Model Adjustment and Validation Using Measured Test Data," (planning) January 1, 1990 - December 31, 1990, \$18,700.
11. Florida High Technology and Industry Council, "Finite Element Model Adjustment/Damage Detection Using Measured Test Data," (operational) January 1, 1991 - December 31, 1991, \$40,000.
12. Florida Space Grant Consortium Interinstitutional Space Research Program: "Structural Health Monitoring," May 1, 1990 - April 29, 1994, \$66,799.
13. Florida Space Grant Consortium Student Fellowship Program, "Structural Dynamics," May 1, 1990 - April 29, 1994, \$79,720.
14. Harris Corporation: "Finite Element Model Refinement with Application to the Harris Multi-Hex Prototype Experiment Facility," May 1, 1991 - August 31, 1992, \$15,000 (in conjunction with Florida Space Grant Consortium Grant above).
15. NSF/SUCCEED, "Teaching Modelling And Analysis Of Dynamic Systems From An Energy Balance Approach Using Multi-Media Tools," August 15, 1992 - August 14, 1995, \$213,606.
16. Sandia National Laboratories, "Optimization Methods for Structural Dynamics Test Design," April 1, 1993 - September 30, 1993, \$20,300.
17. McDonnell Douglas, "Enhanced Damage Detection for Large Space Structures," March 1, 1993 - December 31, 1993, \$25,000 (with Suzanne Smith, University of Kentucky)
18. NASA Headquarters, "Middeck Non-Destructive Evaluation - Phase A," January 17, 1994 - August 19, 1994, \$10,950 (subcontract from McDonnell Douglas).
19. McDonnell Douglas, "Enhanced Damage Detection for Large Space Structures," January 1, 1994 - December 28, 1994, \$52,000 (with Suzanne Smith, University of Kentucky)
20. NASA Langley Research Center, "Integrated Software for Improving the Design and Performance of Advanced Aerospace Structures," September 1, 1995 - August 31, 1996, \$28,242 (subcontract from ACTA, Inc.)
21. UH-Energy Laboratory, "Constrained Genetic Algorithms for Integrated Structure/Control Design of Large Space Structures," January 1, 1995 - August 31, 1995, \$10,353 (direct).
22. McDonnell Douglas, "Enhanced Damage Detection for Large Space Structures," January 1, 1995 - December 28, 1995, \$38,000 (with Suzanne Smith, University of Kentucky)

23. UH-ISSO, "Structural Health Monitoring of Space Structures," January 1, 1995 - August 31, 1995, \$3,310 (direct cost).
24. Texas Coordinating Board - ATP, "Loads Verification and Health Monitoring of Structures Using Test Measurements, January 1, 1996 - December 31, 1997, \$175,200.
25. McDonnell Douglas, "Autonomous Damage Detection And Applications," January 1, 1996 - December 28, 1996, \$36,500 (with Suzanne Smith, University of Kentucky)
26. UH-ISSO Aerospace Post Doctoral Program, "Structural Health Monitoring of Advanced Aerospace Systems, Sept. 1, 1995 - August 31, 1997, \$118,000.
27. UH-ISSO, "Structural Health Monitoring of Space Structures," January 16, 1996 - August 31, 1996, \$13,142.
28. UH-Energy Laboratory, "Fatigue Testing of Horizontal Axis Composite Wind Turbine Blades", May 15, 1996 - August 31, 1996, \$2,409 (graduate student assistantship)
29. NASA Johnson Space Center, "Mir Structural Dynamics Experiment (MiSDE) Flight Project," October 1, 1996 - March 31, 1998, \$35,000 (subcontract from McDonnell Douglas Aerospace).
30. Sandia National Laboratories, "Technical Support for Structural Health Monitoring, Model Correlation, and Ambient Vibration Analysis," November 1, 1996 - September 30, 1998, \$52,883.
31. McDonnell Douglas, "Autonomous Damage Detection and Applications," January 1, 1997 - December 28, 1997, \$34,500 (with Suzanne Smith, University of Kentucky).
32. NASA Langley Research Center, "Integrated Software for Improving the Design and Performance of Advanced Aerospace Structures - Phase II," January 1, 1997 - December 31, 1998, \$140,400 (subcontract from ACTA, Inc.)
33. NASA Reduced Gravity Office, "ZGRADE - Zero Gravity Damage Experiment," December 1996 - April, 1997 (access granted to NASA KC-135 Facility including 6-8 hours of actual flight time (80 parabolas)).
34. National Renewable Energy Laboratory, "A Preliminary Investigation of the Cannon Wind Eagle 300 Rotor Subassembly Joint Modeling And Updating with Test Data," November, 1997 - November 1998, \$17,376
35. Dynacs Engineering Co, "Efficient Model Reduction Methods for Large Scale Multibody Systems," \$9000, January 1998 - December 2001.
36. NASA Johnson Space Center, "Experimental Analysis Using a Laser Dynamic Range Imager (LDRI) Sensor," May 1, 1998 - April 30, 1999, NASA Funding, \$41,565, UH-ISSO funding, \$35,165 (direct).
37. University of Houston, "The NASA JSC/UH Design Partnership," May 2000 - August 2000, \$47,000.
38. NASA JSC Reduced Gravity Office, "ZGraMM - Zero Gravity Machinery Monitoring," September 2000 - March 2001, 60 parabolas on KC-135 aircraft (cost of access to flying laboratory estimated at \$50,000 for the two flights).
39. National Science Foundation, "Experimental Identification of Ritz Properties From Dynamic Testing", August 24, 1998 - August 23, 1999, \$64,783
40. Charles Stark Draper Laboratory, "UH-Draper Graduate Fellowship Program in Control Systems," January 1998 - August 2000, \$52,944.
41. National Science Foundation, "Evolutionary Updating of Model Structure and Parameters," September 15, 2000 - February 28, 2002, \$133,152.
42. NASA JSC/University of Houston, "The NASA JSC/UH Design Partnership," May 2001 - August 2001, \$47,000.

43. NASA JSC Reduced Gravity Office, “ZGraMM Part II - Zero Gravity Machinery Monitoring,” May 2001 - June 2001, 60 parabolas on KC-135 aircraft (cost of access to flying laboratory estimated at \$50,000 for the two flights).
44. National Science Foundation, “Failure Detection in Actively Controlled Structures,” September 15, 2001 - September 14, 2006, \$233,575.
45. University of Houston, “Failure Tolerant Intelligent Structural Systems: Structural Failure,” September 1, 2001 - August 31, 2002, \$20,000.
46. NASA JSC/University of Houston, “The NASA JSC/UH Design Partnership,” May 2002 - August 2002, \$47,000.
47. National Institute of Justice, “Next Generation Police Vehicle,” August, 2003 - December, 2003, \$52,000
48. University of Houston, “ Dynamic Modeling and Characterization of MEMs Devices,” September 2003 - August 2004, \$21,524.
49. NASA JSC, “Advancing Ritz Vector Damage Detection Capability,” May, 2004 - January, 2006, \$12,055.
50. University of Houston (TLC²), “Development of Intelligent Computational Algorithms for the Real-Time Detection of Nonlinear Structural Damage,” June 1, 2005-August 31, 2005, \$71,000.

1.9 NATIONAL MULTI-INSTITUTIONAL CENTERS

1. NASA Headquarters, “Texas Institute for Intelligent Bio-Nano Materials and Structures for Aerospace Vehicles,” August, 2002 - ???, \$3,599,987+ (funded for five years, with potential renewal for up to a total of ten years) (subcontract from Texas Engineering Experiment Station, total NASA budget \$15,000,000+)

1.10 EDITORSHIPS

1. Associate Editor, *Structural Health Monitoring: An International Journal*, February 2001 - present
2. Associate Editor, *Shock and Vibration*, Dec. 1999 - December 2002

1.11 COMMITTEES

1.11.1 National

1. Control of Flexible Structures (COFS) Workshop - Sensors/Actuators Panel, NASA Langley Research Center
2. AIAA Structural Dynamics Technical Committee - May 1991-May 1994.

1.11.2 State

1. Florida Space Research and Development University/College Task Force, 1/3/88 - 8/20/93

1.11.3 University of Houston

1. University of Houston Safety and Security Advisory Board - September 2005 - August 2008
2. University of Houston Faculty Senate - September 2004-August 2006
3. University of Houston Educational Policies and Student Affairs - September 2004-August 2005

4. University of Houston Committee Transportation and Parking Advisory Committee- September 2001 - August 2004
5. Cullen College of Engineering Tenure and Promotion Committee - September 2001 - present
6. University of Houston Committee of Principal Investigators - February 2001 - present
7. University of Houston Grants and Contracts Compliance Training Committee - July 1999 - present
8. University of Houston Title IX Committee - September 1999 - present
9. Mechanical Engineering Undergraduate Curriculum Committee - September 1993 - August 1996.
10. Mechanical Engineering Computer Committee - September 1993 - present.
11. Cullen College of Engineering Computer Committee - September 1996 - December 2003.

1.12 PROFESSIONAL ACTIVITIES:

1.12.1 Officer of Society:

Board Member, Society of Engineering Science, January 1995 - December 1999.

Secretary, Society of Engineering Science, January 1995 - December 1996.

1.12.2 Conference Organization and Session Chair:

Session Chairman, 20th International Modal Analysis Conference, February 2005, Orlando, Florida.

Session Developer & Chairman, 59th Machinery Failure Prevention Technology Forum, 2005, Virginia Beach, Virginia

Session Chairman, 20th International Modal Analysis Conference, February 2004, Dearborn, Michigan

Session Developer & Chairman, 59th Machinery Failure Prevention Technology Forum, 2004, Virginia Beach, Virginia

Session Chairman, 20th International Modal Analysis Conference, February 2003, Kissimmee, Florida.

Session Chairman, 20th International Modal Analysis Conference, February 2002, Los Angeles, California.

Member - Scientific Committee for International Conference on "Structural Dynamics - Modelling Test, Analysis, Correlation and Validation", 3 - 5 June 2002, Madeira Island, Portugal

Session Developer, 19th International Modal Analysis Conference, "SD2000 - Modal Updating: Transition from Research to Practice" (with F.M. Hemez, Los Alamos National Laboratory)

Session Chairman, 19th International Modal Analysis Conference, February 2001, Kissimmee, Florida.

Member - Scientific Committee for EUROMECH 365 International Workshop: DAMAS01, Structural Damage Assessment Using Advanced Signal Processing Procedures, Cardiff, Wales.

Session Chairman, 18th International Modal Analysis Conference, February, 2000, San Antonio, TX.

Member - Scientific Committee for EUROMECH 365 International Workshop: DAMAS99, Structural Damage Assessment Using Advanced Signal Processing Procedures, Dublin, Ireland.

Session Chairman, ASME DETC'99, September 1999, Las Vegas, NV

Session Chairman, 17th International Modal Analysis Conference, February, 1999, Orlando, FL

Member - AIAA Guidance, Navigation and Control Technical Committee (Houston local), Jan. 1993 - Dec. 1993.

Member - AIAA Structural Dynamics Technical Committee (Houston local) - Nov. 1996 - present.

Member - Scientific Committee for EUROMECH 365 International Workshop: DAMAS97, Structural Damage Assessment Using Advanced Signal Processing Procedures, Sheffield, UK.

Session Organizer/Chairman, 16th International Modal Analysis Conference, February, 1998, Santa Barbara, CA.

Conference Organizer - 1995 Texas Systems Day, October 14, 1995, Houston, TX.

Committee Member/Organizer - AIAA/ASME Adaptive Structures Forum, April 19-22, 1993, La Jolla, California.

Session Chairman, 15th International Modal Analysis Conference, February, 1997, Orlando, FL.

Session Chairman, AIAA Adaptive Structures Forum, April, 1995, New Orleans, Louisiana.

Session Chairman, AIAA/ASME/ASCE/AHS 35th SDM Conference, April 18 - April 20, 1994, Hilton Head, South Carolina.

Session Chairman, AIAA Dynamic Specialist Conference, April 21 - April 22, 1994, Hilton Head, South Carolina.

Session Chairman, AIAA Adaptive Structures Forum, April 21 - April 22, 1994, Hilton Head, South Carolina.

Session Chairman, AIAA/ASME/ASCE/AHS 34th SDM Conference, April 19-21, 1993, LaJolla, California.

Session Chairman, AIAA/ASME/ASCE/AHS 33rd SDM Conference, April, 1992, Dallas, Texas.

Session Chairman, Society of Engineering Science 28th Annual Technical Meeting, November 6-8, 1991, Gainesville, Florida

Session V-Chairman, Thirteenth Biennial ASME Conference on Mechanical Vibration and Noise, September 22-25 1991, Miami, Florida

Session V-Chairman, ASME Design Technical Conferences, September 17-20, 1989, Montreal, Quebec, Canada.

Session Chairman, ASME Design Technology Conferences, September 27-30, 1987, Boston, Massachusetts.

Session Chairman, 23rd Annual Meeting of the Society of Engineering Sciences, August 26-27, 1986, Buffalo, New York.

Faculty Advisor - University of Florida AIAA Student Chapter, Fall 1988 - 8/20/93

1.12.3 Other:

Nanotechnology Foundation Scientific Advisory Board - 1993-present

1.12.4 Reviewer for

National Science Foundation
Army Research Office
AIAA Journal
AIAA Journal of Guidance, Control, and Dynamics
AIAA Journal of Spacecraft and Rockets
ASME Journal of Applied Mechanics
ASME Journal of Vibration, Acoustics, Stress and Reliability in Design
ASME Journal of Vibration and Acoustics
ASME Journal of Mechanical Design
IEEE Transactions on Automatic Control
ASCE Journal of Aerospace Engineering
Journal of the Astronautical Sciences
Journal of Optimization Theory and Applications
Dynamics and Stability of Systems
Journal of Intelligent Material Systems and Structures
Inverse Problems in Engineering
AIAA Structures, Structural Dynamics and Materials Conference
IEEE Controls and Decision Conference
ASME/ASCE/SES Joint Symposium on Dynamics, Stability and Control of Structural Systems
Idaho Board of Education Specific Research Grant Program
Australian Research Council Large Grants Program
Shock and Vibration Digest
Jordan University

1.12.5 Societies and Organizations

American Society of Mechanical Engineers
American Institute of Aeronautics and Astronautics
Society of Experimental Mechanics
Society of Engineering Science
Tau Beta Pi
Pi Tau Sigma

1.13 TEACHING

1.13.1 Courses Taught

MECE 7397 Finite Element Analysis
MECE 7397 Optimal Control Theory
MECE 7397 Experimental Methods: Vibration Testing and Modal Analysis
MECE 6390 Modern Techniques of Structural Dynamics
MECE 5371 Mechanical Vibrations
MECE 5367 Control Systems Analysis & Design
MECE 4332 Mechanical Design III: Finite Element Methods in Design
MECE 3338 Mechanical Design II: Dynamics and Control of Mechanical Systems

EGM 4200	Mechanical Vibrations
EAS 4412	Synthesis of Guidance and Control Systems
EAS 4400	Stability and Control of Aircraft
EAS 6415	Guidance and Control of Aerospace Vehicles (FEEDS)
EGM 5421	Modern Techniques in Structural Dynamics (FEEDS)
EGM 6215	Theory of Structural Vibrations, Spring (FEEDS)
EAS 4201L	Aerospace Structures Laboratory 1, (1/5 of course)

1.13.2 Graduate Student Supervision

Degrees Granted (Ph.D. dissertations):

1. Omar, Ahmed Fahmy O., "Realization of Lift-Coefficients of Multi-Story Offshore Platforms Using Measured Test Data," Coastal and Oceanographic Engineering, 1992 (Co-Chairman with Dr. M. Sheppard, Coastal Engineering).
2. Kaouk, Mohamed, "Structural Damage Assessment and Finite Element Model Refinement Using Measured Modal Data," 1993.
3. Maben, Egbert, "Decentralized Control of Flexible Space Structures Using Time Varying Feedback," 1996.
4. Larson, Cinnamon, "Vibration Testing by Design: Excitation and Sensor Placement using Genetic Algorithms", 1996.
5. Simmermacher, Todd., "Damage Detection and Model Refinement of Coupled Structural Systems", 1996.
6. Abdallah, Musa., "Control Oriented Damage Detection Methods in Structures", 1999. (coadvise with K. Grigoriadis)
7. Cao, Timothy, "Identification of Ritz Vectors with Application to Structural Health Monitoring", 2000
8. Keng, Che-Keng., "Optimization of Incomplete Dynamics for Structural Model Refinement and Damage Assessment," 2000.
9. Lopez, Frank, "A Real Time, Time Domain Minimum Rank Perturbation Theory", 2002

Degrees Granted (M.S. theses):

1. Widengren, Martin, "An Analytical Method for the Symmetric Correction of Mathematical Models of Vibrating Systems Using Eigenstructure Assignment", 1989.
2. Bernzott, William, "Development of a Test Article for Simulating Characteristics of Large Flexible Space Structures," 1989.
3. Sugavanam, Sujatha, "Optimal Placement of Control Components with Nonnegligible Mass," 1990.
4. Yaker, David, "Modelling and Control for the NASA/KSC Closed-Loop Life Support Systems," 1991.
5. Ragner, Gary, "Development of Robotic Tactile Sensing using Piezoelectric Film," 1991.
6. Gates, N. Dale, "Stability Characteristics of a Tail Control Missile with Aerodynamic Cross-Coupling," 1991.

7. Delphnich, David, "Filtered Pulse Control for Vibration Suppression of Large Flexible Structures," 1991.
8. Lyde, Terri, "Failure Detection and Isolation Using a System Realization Approach," 1991.
9. Rhoades, Carol, "A Neural Network Implementation of the Low Authority Threshold Control Strategy," 1992.
10. Layton, David, "Genetic Algorithm Learning Control of Large Angle Slewing Maneuvers," 1992.
11. Leath, William, "Analysis of Neural Network Supervised Training with Application to Structural Damage Detection," 1993.
12. Prahlad, Sampath, "Damage Detection in Large Space Structures Using Genetic Algorithms," 1994.
13. Zaricki, Adam, "Solutions To Problems of Practical Application of a Vibration-Based Structural Damage Location Algorithm," 1995.
14. Gafka, George, "Structural Damage Detection via Least Squares Dynamic Residual Force Minimization with Quadratic Measurement Error Inequality Constraint," 1995.
15. Keng, Che-Keng, "Genetic Algorithms Approach For Vibration-Based Model Refinement and Damage Detection of Structures", 1997.
16. Krishnamurthy, Jayaram, "Loads Verification and Health Monitoring of Structures," 1997.
17. Chippwadia, Ketan., "Evolving Autonomous Identification of Modal Parameters", 1998
18. Lopez, Frank., "A Subspace Recognition Approach for Structural Damage Localization Using Incomplete Modal Measurements," 1999.
19. Boxeon, Thomas. "Advances in Experimental Ritz Vector Identification for Practical Structural Dynamics Applications," 2001.
20. Jeancolas, Hugues., "Identification of Ritz Vectors and their Application in Damage Detection," 2001
21. Sivaraman, A., "Autonomous Health Monitoring of Structural and Control Components," 2001.
22. Trauth, Ryan, "Structural Approximation Theories to Support Updating of Model Physics and Parameters," 2002
23. Jorgenson, Soren, "A Distributed Evolutionary Approach for Updating both Model Physics and Parameters," 2003
24. Mallick, Siddharth, "Vibration Isolation Platforms for Next Generation Police Vehicles", 2004
25. Link, Ryan, "An Approach for Model Updating of a Multi-Physics MEMs Micromirror, 2004
26. Shahsavari, Mehdi, "Hierarchical Binary Coding Based Structural Health Monitoring," 2005
27. Shen, ShanShan, "Fault Detection and Isolation of Actively Controlled Structures," 2005
28. Rudic, Aleksandar, "Structural Control and Damage Detection Test-bed," 2005

Degrees Granted (nonthesis M.S. option):

1. Jang, J.-W., Aerospace Engineering, 1991.
2. Kaouk, M., Aerospace Engineering, 1991.
3. Larson, Cinnamon, Engineering Science, 1992

Graduate Students Under Current Supervision:

1. Clark, Robert, "Model Validation and Verification of Nonlinear Systems," Ph.D. (part time)

2. Link, Ryan, "Adaptive Control to Accommodate Structural Failures", Ph.D.
3. Akar, Karem, "On the Use of Closed-Loop Control to Enhance Structural Damage Detection," Ph.D.
4. Chippwadia, K.C., topic under development, Ph.D. (part time)
5. Shen, Shanshan, topic under development, PhD
6. Bouaziz, Souhail, "Nonlinear Structural Health Monitoring", PhD
7. Taylor, Stuart, "Advances in Ritz Vector Identification and Their use in Structural Damage Detection," MS
8. Saripalli, Lavanya, "Hilbert-Huang Based Structural Damage Detection," MS

Postdoctoral Associates

1. dos Santo, Jose-Marie: Model Correlation and Damage Detection of Complex Models
2. James, George: Damage Detection in Complex Aerospace Structures
3. Lopez, Frank: Structural Fault Detection
4. Zimin, Valery: Hierarchical Binary Coding

1.13.3 Undergraduate student research supervision

High Honor Projects:

1. Reynolds, Sean, "Preliminary Truss Configuration Development Using Darwinian Search," 1990.
2. McFarland, Mike., "An Actuator Placement Strategy Considering Possible Failures," 1990.
3. Fauzz, Jerry, "Mass Tradeoff Studies in Dual Structure/Control Design," 1990.
4. Jackson, Bobby, "Experimental Active Control for Failure-Tolerant Intelligent Structural Systems," 1992.
5. Zaricki, Adam, "Effect of Eigenvector Expansion on Success of a Damage Detection Algorithm With Incomplete Measurement of Structural Eigenvectors," 1993.
6. Herdocia, Oscar, "Vibration Signatures in Zero-Gravity," 2001
7. Henegan, Matthew, "Advanced Vibration Signatures in Zero-Gravity," 2002
8. Taylor, Stuart, "Structural Damage Detection Using Ritz Vectors and Matrix Disassembly, 2005

NASA KC-135 "Vomit Comet" Undergraduate Student Flights/Projects:

1. Berrio, Jason, Herdocia, Oscar, Moran, Ruben, Shah, Jainik, Sidle, Brian, Stalcup, Brian, and Henegan, Matthew, "Zero Gravity Machinery Monitoring," 90 parabolic flights on KC-135, 2001
2. Myers, Eric, and Hayes, Roy, "Reduced Gravity Evaluation of Damage Detection," 40 parabolic flights on KC-135, 1997

1.13.4 AIAA Student Paper Competition Supervision

Graduate Student

1. Bernzott, W., "Development of a Test Article for Simulating Characteristics of Large Flexible Space Structures," 1989, 2nd Place Honors (out of approximate field of 12).
2. Sugavanam, S., "Optimal Placement of Control Components with Nonnegligible Mass," 1990.

3. Lyde, T., "Sensor Failure Detection and Isolation In Flexible Structures Using the Eigensystem Realization Algorithm (ERA)," 1991, 3rd Place Honors (out of approximate field of 11).
4. Rhoads, C., "Implementation of Advanced Control Laws Using Neural Networks", 1992, 2nd Place Honors (out of approximate field of 16)
5. Zaricki, A., "Structural Damage Detection With No Analytical Model and Incomplete Modal Data," 1994, 1st Place Honors.

Undergraduate Student

1. Buckles, C., and Rhoads, C., "A Simulation Model of a Bioregenerative Life Support System for Extended Space Missions ,1990, 2nd Place Honors (out of approximate field of 22).
2. McFarland, M., "An Actuator Placement Strategy Considering Possible Failures," 1991.
3. Fox, S., "Optimal Damping of Structures Using Viscoelastic Treatment," 1991.
4. Zaricki, A., "Effect of Eigenvector Expansion on Success of a Damage Detection Algorithm With Incomplete Measurement of Structural Eigenvectors", 1993.

Student Awards Obtained Under My Supervision:

1999 HEDS UP Mars Exploration Design Competition (Undergraduate) 3rd Place - Amir Hemmat, Chi Nguyen, Bharat Singh, and Keir Wylie)

1998 ASNT Scholarship - Mr. Musa Abdalla, Mr. Chee Keng Yap, Mr. Frank Lopez

1998 ASME OMAE Scholarship - Mr. Chee Keng Yap

1998 TSGC Fellowship - Mr. Frank Lopez

1995 AIAA Structures, Structural Dynamics and Materials Jefferson Goblet Award - Mr. Todd Simmermacher

1995 AIAA National Student Conference Best Paper Award (presented at 1995 AIAA Aerospace Sciences Meeting, Reno, NV) - Mr. Adam Zaricki

1994 AIAA Southeastern Student Conference Best Paper Award - Mr. Adam Zaricki