09/09

# CURRICULUM VITA

STEPHEN M. BATILL, Ph.D., P.E.

Professor of Aerospace and Mechanical Engineering
University of Notre Dame, Notre Dame, Indiana 46556.

## Educational Background

University of Notre Dame - B. S. in Aerospace Engineering, 1969.
University of Notre Dame - M. S. in Aerospace Engineering, 1970.
University of Notre Dame - Ph.D. in Aerospace Engineering, 1972.

## Professional Experience

University of Notre Dame

Professor, Department of Aerospace and Mechanical Engineering - Responsible for developing and teaching undergraduate courses in engineering systems and product design. Has also taught aircraft design, solid and structural mechanics, aircraft structures, aerodynamics and aeroelasticity. Current research activities related to engineering systems and product design methodology and optimization, risk and failure in engineering decision-making, and the application of simulation, artificial intelligence and soft computing to engineering design. September 1978 - present.
Aerospace and Mechanical Engineering Department Chair (2002-2008)
Director, Hessert Center for Aerospace Research (1991 - 1998)
Director, London Engineering Program, Fall 1996
Co-Director, London Summer Engineering Program, Summer 2009

Visiting Professor, Product Innovation Management Department, Faculty of Industrial Design Engineering, Technical University Delft, (Jan. – July 2009)
Fulbright Scholar – Netherlands (Jan. – July 2009)

Scholar in Residence (Aug. – Dec. 2008)
IDEO, Palo Alto, California,

Visiting Professor (Aug. – Dec. 2008)
Department of Aeronautics and Astronautics
Stanford, California

Associate Dean for Educational Programs, College of Engineering
Responsible for new, multidisciplinary academic program development across the College, the implementation of a new First Year of Studies curriculum for a students in the College and the development of the College Learning Center. 1999 - 2002

Visiting Professor (Aug. – Dec. 1996)
Department of Aeronautics
Imperial College London
London, England

Visiting Scientist (Aug. – Dec. 1993) National Transonic Facility, NASA Langley Research Center, Hampton, Virginia

United States Air Force Academy, Department of Aeronautics, Colorado:
Assistant Professor: Responsible for teaching undergraduate courses in basic aerodynamics and flight mechanics, advanced subsonic and supersonic aerodynamics, and aircraft structures. Responsible for developing a new course and textbook in structural analysis and design. Principal Investigator on funded research programs. Curriculum Advisor, Academic Advisor and Scheduling Officer. Directed numerous student laboratory research projects. January 1976 - August 1978.

Air Force Flight Dynamics Laboratory, Design Analysis Group, Vehicle Dynamics and Structures Division, Wright-Patterson Air Force Base:
Aeronautical/Project Engineer: Responsible for government and contractor research programs in optimal structural design and aeroelastic optimization. Conducted research in preliminary design methods and transonic aerodynamic analysis. July 1973 - January 1976.

Air Force Flight Dynamics Laboratory, Aeroelastic Group, Vehicle Dynamics Division, Wright-Patterson Air Force Base:
Aeronautical Engineer: Responsible for conducting and monitoring contractor research in the areas of flutter analysis, structural optimization and automated design, wind tunnel and flight flutter testing. July 1972 - July 1973.

Consulting Activities
AlliedSignal Aerospace Corporation, Guidance Systems Division
Ten Ech Environmental Consultants
Argonne National Laboratories
Wilson Sporting Goods Company
Utilimaster Corporation
Sofamor Danek Manufacturing

Military Service
ROTC Commission in June 1969.
Commissioned Officer in U. S. Air Force, 1969-1978.
Tendered Regular Commission, 1977, Final rank - Captain.

Professional Recognition and Honors
Air Force Commendation Medal with Cluster, 1975, 1978.
Argonne National Laboratory Summer Faculty Fellowship, 1979.
ASEE, Dow Outstanding Young Faculty Award (Ill./Ind. Section), 1981.
Associate Fellow, American Institute of Aeronautics and Astronautics, 1982.
Outstanding Faculty Advisor Award, Notre Dame Student Chapter, 1985-86
American Institute of Aeronautics and Astronautics.
Department of Aerospace and Mechanical Engineering, Faculty Award, 1985, 1998.

AIAA Faculty Advisor Award, Great Lakes Region, 1989.
ASEE Outstanding Paper/Presentation Award, Illinois/Indiana Regional Conference, March 1992.
Society of Automotive Engineers, 1991 Arch T. Colwell Merit Award
University of Notre Dame Kaneb Award for Excellence in Teaching and Curriculum Development, 1999, 2006.
John Leland Atwood Award, American Society for Engineering Education and the American Institute of Aeronautics and Astronautics, 2000.
Fulbright Scholar – Netherlands (Jan. – July 2009)

Professional Membership and Service

Associate Fellow , American Institute of Aeronautics and Astronautics
- Multidisciplinary Design Optimization Technical Committee, 2000 – 2004.
- Student Chapter Faculty Advisor, University of Notre Dame, 1981 -1989.
- Ground Testing Technical Committee, 1981-1984.
- Chairman, St. Joseph Valley Section, 1985 - 1999.
- Treasurer, St. Joseph Valley Section, 1982-1985.
- Vice Chairman, St. Joseph Valley Section, 1979-1980.
- Education Committee Chairman, Rocky Mountain Section, 1977.

Member, American Society of Mechanical Engineers
Member, American Society for Engineering Education
Member, Sigma Gamma Tau, National Aerospace Honor Society
- National President, 1994-1997.
- National Vice President, 1991-1994.
- Great Lakes Regional Coordinator, 1988-1992.
- Notre Dame Student Chapter Advisor, 1981-1994, 1997-Present

Member Tau Beta Pi, National Engineering Honor Society
National Council of Engineering Examiners, Item Writer, Aerospace Discipline

Journals Reviewed :
- Journal of Fluid Mechanics
- ASME Journal of Fluids Engineering
- ASME Journal of Dynamic Systems and Control
- ASME Journal of Vibration and Acoustics
- Experiments in Fluids
- AIAA Journal
- AIAA Journal of Aircraft
- AIAA Journal of Spacecraft and Rockets
- AIAA Journal of Guidance, Control and Dynamics
- AIAA Journal of Propulsion and Power
- Journal of Fluids and Structures
- ASCE Journal of Structural Engineering
- ASCE Journal of Aerospace Engineering
- ASCE Journal of Computing in Structures
- Neural Computations

University of Notre Dame Service
Vice President for Research Search Committee, 2006-2007
College of Engineering Dean's Search Committee, 2005-2007
Provost's Advisory Committee, 2005 - 2008
University Committee for International Studies, 2004 - 2007
University Valedictorian Selection Committee, 2004 - 2006
University of Notre Dame Faculty Senate, 1979 - 1982, 1994
(Chairman of Student Affairs Committee, 1979 - 1980).
American Institute of Aeronautics and Astronautics, Notre Dame Student
Chapter, Faculty Advisor, 1981 - 1989.
Sigma Gamma Tau, National Aerospace Honor Society
Faculty Advisor, 1981 - 1994, 1997 - Present
University Campus Life Council, 1982.
Jesse H. Jones Faculty Research Fund Committee, 1983 - 1988.
Engineering College Council, 1982 - 1988, 1989 - 1992, 1999-Present
Committee on Appointments, Promotions and Tenure, Aerospace and Mechanical Engineering, 1983 - 1989, 1997- 2000, 2002- Present.
Provost's Code of Honor Committee, 1985 - 1986.
University Honor Code Committee, 1987 - 1993.
University Faculty Grievance Committee, 1987-1993.
Chairman 1992-1993.
Faculty Fellow, International Institute for Peace Studies, 1988-1992.
Jesse H. Jones Faculty Research Equipment Fund Committee, 1990.
Department Committee on Computer Facilities and Utilization, 1989-1996.
Department Committee on Goals and Planning, 1988-1999.
Aerospace Engineering Undergraduate Curriculum Committee- 1978-1999.
Department Committee on Undergraduate Instructional Labs
Director, Hessert Center for Aerospace Research, 1991 - 1998
Academic Council, 1994-1996.
AME Department Chair Recommendation Committee, 1996.
Director, London Engineering Program, Fall 1996.
College Computing Committee, 1997-1998.
College Curriculum Enhancement Committee, 1998-1999.
AME Department Chairman Review Committee, 1999.
Provost Task Force on Curriculum Innovation, 1999.
Rhodes/Marshall/Mitchell Scholars Selection Committee, 1999-2002.
College of Engineering Executive Committee, 1999 - present.
Ad-Hoc Committee on Undergraduate Engineering/Business Curriculum, 2000.
Universal Notre Dame Night Presentations: Long Island, NY, 2002, Ft. Walton Beach, FL. 2004

Courses Taught at the University of Notre Dame
Introduction to Engineering Systems I
Introduction to Engineering Systems II
Engineering Concepts
Mechanics I - Statics
Mechanics II - Dynamics

Mechanics of Solids
Introduction to Aeronautics
Structural Mechanics I
Differential Equations and Applied Mathematics
Ideal Aerodynamics
Design Methodology*
Manufacturing and Assembly for Aerospace Systems*
Flight Mechanics and Introduction to Design*
Aerospace Design *
Aerodynamics Laboratory
Aerospace Structures*
Aerospace Structures Lab*
Matrix Methods in Structural Analysis*
Mechanical Engineering Senior Design Project*
Artificial Intelligence and Soft Computing in Mechanical Engineering
Risk and Failure in Engineering Systems*
Technology Forecasting*
Introduction to Aeroelasticity*
Advanced Measurements Laboratory
(Various prefix and number systems have been used to identify these courses since 1978. Courses indicated with an asterisk were developed or substantially modified by Dr. Batill)

Master's Theses Supervised

Weiyu Liu - "Gradient-enhanced Response Surface Approximations Using Neural Networks," August 2000
L. Nathaniel Georges - "A Study of Finite Element Modeling of Thin-Walled Structures," May 1993.
J. Kevin Costello - "Development of Instrumentation and Methods for Flight Test of Remotely Piloted Vehicles", Dec. 1992.
James O'Leary - "Configurational Optimization for Axisymmetric Structures", May 1992.
David M. Carey - "On-line Digital Data Processing for Flight Flutter Testing", May 1991.
Walter H. Howard - "A Study of the Use of Remotely Piloted, Sub-scale Aircraft for High Reynolds Number Testing", January 1990.
Daniel T. Jensen - "A Drag Prediction Methodology for Low Reynolds Number Flight Vehicles", January 1990.
Scott A. Thompson -"Separated Flow Field on a Pitching Delta Wing," August 1989.
Wenzong Chen - "Modeling and Parameter Estimation of Nonlinear Systems", May 1989.
Sedra M. Walton - "Aerodynamic Characteristics of Half-Span and Full-Span Delta Wings with and without Canards," May 1989.
Richard A. Swift - "Finite Element Analysis for Conceptual Design of Aerospace Structures", May 1989.
Jose V. Nebres - "Flow around Yawed, Stranded Cables," May 1989.
John M. Bacarro - "Modeling and Parameter Identification of Dynamic Systems with Application to Aircraft Landing Gear", May 1988.

Scott P. LeMay - "Leading Edge Vortex Dynamics on a Pitching Delta Wing", May 1988.
Joseph J. Hoffman - "The Use of Surface Paneling Techniques to Predict Flows in Three-Dimensional Converging Inlets", May 1983.
Michael J. Caylor - "An Experimental Investigation of the Flow Field in Three-Dimensional Wind Tunnel Inlets", May 1983.
Nikolaos Adonakis - "Calibration and Evaluation of a Transonic Wind Tunnel", May 1981.

Doctoral Dissertations Directed

Dhanesh Padmanabhan, " Reliability Optimization in an Multidisciplinary Design Environment," August 2003.
Weiyu Liu, "Gradient Enhanced Global Response Surface Approximations," August 2003.
Marc A. Stelmack, " Concurrent Subspace Design for Mixed Continuous-Discrete Design," May 1999.
Richard S. Sellar - "Multidisciplinary Design Using Artificial Neural Networks for Discipline Coordination and System Optimization ," May 1997.
James K. Pinkelman - "Time Domain Identification of Linear Dynamic Structural Systems Using Total Least Squares," May 1995.
Richard A. Swift - "Structural Design Using Neural Networks," December 1992.
Jose V. Nebres - "Boundary Layer Separation and Vortex Formation in the Near Wake of Quasi-Cylindrical Bluff Bodies," August 1992.
Joseph J. Hollkamp - "Identification of Discrete Time Series Models for Structural Response Prediction," May 1989.

Funded Research Support at the University of Notre Dame

Development of Design Criteria for a High Speed Flow Visualization Technique Department of Air Force, (PI with Co-PIs R.C. Nelson and T.J. Mueller), 1979-1980 - ($69,486)

The Structure of Separated Flow Regions Occurring Near the Leading Edge of Airfoils-Including Transition, NASA Langley Research Center, (Co-PI with T.J. Mueller), 1980-1981 - ($75,282)

An Evaluation of the Influence of Nonlinear Landing Gear Characteristics on Aircraft Taxi Dynamics, Air Force Wright Aeronautical Laboratories, 1980-1981 - ($17,174)

Development of Design Procedures for Three-Dimensional Wind Tunnel Contractions, Air Force Wright Aeronautical Laboratories, 1981-1982 – ($77,817)

Vortex Loop Dynamics – A Phenomenological Model for Turbulent Boundary Layer Structure, AFOSR, (Co-PI with T.L.Doligalski), 1981-1985 – ($195,676)

Equipment for an Advanced Measurements Laboratory in Fluid Mechanics and Aerodynamics, National Science Foundation, (Co-PI with R.C. Nelson, T.J. Mueller and A.A. Szewczyk), 1981-1983 – ($27,000)

Experimental Studies of the Boundary Layer Characteristics of a Two-Dimensional Airfoil at Low Reynolds Numbers, Office of Naval Research (Co-PI with T.J. Mueller and R.C. Nelson), 1981-1982 – ($32,000)

Parametric Identification for Aerospace Structures, Air Force Wright Aeronautical Laboratories, 1984-1986 – ($148,690)

Aerodynamic Testing of a Radio Frequency Expandable Decoy, STG Electrosystems Incorporated, (Co-PI with R.C. Nelson), 1984 -1985 – ($84,000)

Vortex Dynamics of Highly Swept Wings Undergoing Unsteady Motions, NASA Langley, (Co-PI with R.C. Nelson), 1986-1989 – ($110,959)

NASA Minority Training Grant, NASA Langley, (Co-PI with R.C. Nelson), 1986-1987 – ($16,800)

Flow Field Measurements of Stranded Cables, Department of Navy, (PI with Co-PI R.C. Nelson), 1987-1989 – ($90,040)

Parametric Identification for Aerospace Structures, Department of the Air Force 1988 – ($12,756)

Canard/Wing Vortex Interaction, NASA - Graduate Student Researchers Program – Minority Focus, (Co-PI with R.C. Nelson), 1988-1989 – ($18,000)

Advanced Aeronautics Design Program, NASA - University Space Research Association,1988-1994 – ($125,528)

Application of Microcomputers to Aircraft Preliminary Design, Apple Computer, Inc., 1988-1989 – ($10,587)

Flow About Cables and Cylinders with Surface Irregularities,Department of Navy 1988-1992 – ($29,941)

Preliminary Design of Flight Vehicle Structures, Department of the Air Force 1989-1993 – ($169,582)

Digital Data Processor for Flight Flutter Testing, NASA Ames Research Center, 1990-1992 – ($59,993)

Time Domain Parameter Identification, NASA Ames Research Center,1992-1995 – ($72,961)

Laser Doppler Velocimeter and Phase Doppler Particle Analyzer, Aerometrics, Incorporated, (Co-PI with P.F. Dunn, E.J. Jumper, R.C. Nelson and F.O. Thomas), 1993-1994 – ($82,075)

Wind Tunnel Data System Accuracy Assessment, NASA Langley Research Center, 1993-1994 – ($40,663)

Neural Network Application to Structural Design, CSA Engineering, Incorporated (PI with J.E. Renaud), 1993-1994 – (29,406)

Multidisciplinary Design Technology Development, NASA Langley Research Center, (Co-PI with J.E. Renaud and J.B. Brockman),1994-1997 – ($743,911)

Multidisciplinary Design Subject to Uncertainty, General Motors Corporation (Co-PI with J.E. Renaud), 1995-2003 – ($7,000)

Visiting Scholar Support, Japanese Patent Office,1997-1999 – ($12,000)

Engineering Faculty Development Workshop, National Science Foundation 1998–1999 – ($62,502)

Journal Articles

1. Batill, S. M. and Ingram, C. W., "Determining Aircraft Stability Coefficients from Dynamic Motions", AIAA Journal of Aircraft, Vol. 8, No. 11, pp. 932-934, November 1971.
2. Wilkinson, K., Markowitz, J., Lerner, E., George, D., and Batill, S. M., "FASTOP: A Flutter and Strength Optimization Program for Lifting Surface Structures", AIAA Journal of Aircraft, Vol. 14, No. 6, pp. 581-587, June 1977.
3. Batill, S. M. and Mueller, T. J., "Visualization of Transition in the Flow Over an Airfoil Using the Smoke-Wire Technique", AIAA Journal, Vol. 19, No. 3, pp. 340-345, March 1981.
4. Mueller, T. J. and Batill, S. M., "Experimental Studies of Separation on a Two - Dimensional Airfoil at Low Reynolds Numbers", AIAA Journal, Vol. 20, No. 4, pp. 457-463, April 1982.
5. Batill, S. M. and Hoffman, J. J., "The Aerodynamic Design of Three -Dimensional, Subsonic Wind Tunnel Inlets," AIAA Journal, Vol. 24, No. 2, pp. 268-269, Feb. 1986.
6. Hollkamp,J.J.,Batill,S.M., "Noise Bias in Various Formulations of Ibrahim's Time Domain Technique," AIAA Journal, Vol. 27, No. 8, pp 1142-1145, Aug 1989.
7. Batill, S. M. and Hollkamp, J. J., "Parameter Identification of Discrete Time Series Models for Structural Response Prediction," AIAA Journal, Vol. 27, No. 11, pp. 1636- 1643, Nov. 1989.
8. LeMay, S.P., Batill, S.M., and Nelson, R.C., "Vortex Dynamics on a Pitching Delta Wing," AIAA Journal of Aircraft, Vol. 27, No. 2, pp.131-138, Feb. 1990.
9. Hollkamp, J.J., Batill, S.M., " Time Series Models for Nonlinear Systems" ASCE Journal of Aerospace Engineering, Vol.3, No.4, pp.271-284, Oct 1990.

10. Hollkamp, J.J., Batill, S.M., " Automated Parameter Identification and Order Reduction for Discrete Time Series Models," AIAA Journal, Vol.29, No.1, pp.96-103, Jan. 1991.
11. Thompson, S.A., Batill, S.M., Nelson, R.C., "The Separated Flow Field On A Slender Wing Undergoing Transient Pitching Motions," AIAA Journal of Aircraft, Vol. 28, No. 8, pp. 489-495, August 1991.
12. Hollkamp, J.J., Batill, S.M., "A Recursive Algorithm for Discrete Time Domain Parameter Identification", ASME Journal of Dynamic Systems, Measurement and Control, Vol. 114, No.1,pp. 27-33, March 1992.
13. Nebres, J., Batill, S.M., Nelson, R.C.,"Flow about yawed, stranded cables," Experiments in Fluids, Vol. 14, pp.49-58, Jan. 1993.
14. Nebres, J., Batill, S.M.,"Flow around the Circular Cylinder with a Single Large-Scale Surface Perturbation," Experiments in Fluids, Vol. 15, pp. 369-379, Dec. 1993.
15. Pinkelman, J.K. , Batill, S.M. and Kehoe, M.W., "Total Least Squares Criteria in Parameter Identification for Flight Flutter Testing," AIAA Journal of Aircraft, Vol. 33, No. 4, July-August 1996.
16. Wujek, B., Renaud, J., Batill, S.M., and Brockman, J., "Concurrent Subspace Optimization Using Design Variable Sharing in a Distributed Computing Environment," Concurrent Engineering: Research and Applications, Vol. 4, No. 4, pp.361-377, Dec. 1996.
17. Nigim, H.H., and Batill, S.M.,"Flow About Cylinders with Surface Perturbations," Journal of Fluids and Structures, Vol. 11, pp. 893-907, 1997.
18. Batill, S.M., Sellar, R.S. and Stelmack, M., "A Framework for Multidisciplinary Design Based upon Response-Surface Approximations," AIAA Journal of Aircraft, Vol. 36, No. 1,pp. 287-297, 1999.
19. Batill, S.M., Stelmack, M.A., and Yu, X.Q., "Multidisciplinary Design of an Electric-Powered UAV, Aircraft Design, Vol. 2, No. 1, pp. 1-18, 1999.
20. Stelmack, M., Batill, S., Beck, B., "Design of an Aircraft Brake Component Using an Interactive Multidisciplinary Design Optimization Framework," ASME Journal of Mechanical Design, Vol. 122, No. 1, pp. 70-76, March 2000.
21. Gu, X., Renaud, J.E., Batill, S.M., Brach, R.M., Budhiraja, A., "Worst Case Propagated Uncertainty of Multidisciplinary Systems in Robust Optimization", Structural Optimization, Volume 20, Number 3, pp. 190-213, Published by Springer-Verlag, Germany, 2000.
22. Gu, X., Renaud, J.E., Ashe, L.M., Batill, S.M., Budhiraja, A.S., Krajewski, L.J., "Decision Based Collaborative Optimization under Uncertainty", ASME Journal of Mechanical Design, Volume 124, Number 1, pp. 1- 13, March 2002.
23. Padmanabhan, D., Agarwal, H., Renaud, J.E., Batill, S.M., "A study using Monte Carlo Simulation for failure probability calculation in Reliability-Based Optimization," Optimization and Engineering, Volume 7, Number 3, pp. 297-316, September 2006.

Chapters in Books

1. Batill, S.M., and Nelson, R.C., "Low Speed, Indraft Wind Tunnels", in Frontiers in Experimental Fluid Mechanics: Lecture Notes in Engineering, No. 46, Springer-Verlag, Berlin, pp. 25-94, 1989.

2. Nigim, H. H. and Batill, S.M., "Experimental Modelling of the Flow Field About Cylinders with Surface Perturbations, " Engineering Turbulence 2, Rodi and Marato (Eds.), Elsevier, Amsterdam, pp. 563-572, 1993.
3. Nigim, H. H. and Batill, S.M., "Flow about Cylinders with Large-Scale Asymmetric Surface Perturbations," Turbulence, Heat and Mass Transfer 2, Hanjalic and Peeters (Eds.), Delft University Press, pp. 105-110, 1997.
4. Wujek, B.A., Renaud, J.E., Batill, S.M., "A Concurrent Engineering Approach for Multidisciplinary Design in a Distributed Computing Environment", Multidisciplinary Design Optimization: State-of-the-Art, N. Alexandrov and M.Y. Hussaini (Ed.), SIAM Series: Proceedings in Applied Mathematics 80, pp. 189 - 208, 1997.
5. Wujek, B., Renaud, J., Batill, S., Johnson, E., and Brockman, J., "Design Flow Management and Multidisciplinary Design Optimization in Application to Aircraft Concept Sizing, "Integrated Product and Process Development, Methods, Tools and Technologies, Usher, J.M., Roy, U. and Parsaei, H.R, Editors, John Wiley and Sons, Inc., New York, pp.355-376,1998 .

Conference Proceedings and Symposium Papers

1. Batill, S. M. and Ingram, C. W., "An Investigation of Unsteady Aerodynamics on an Oscillating Airfoil", AIAA paper No. 73-318, Dynamics Specialist Conference, Williamsburg, Virginia, 9 pages, March 1973.
2. Wilkinson, K., Markowitz, J., Lerner, E., George, D., and Batill, S. M., "Application of the Flutter and Strength Optimization Program (FASTOP) to the Sizing of Metallic and Composite Lifting Surface Structures", 17th Structures, Dynamics and Materials Conference, 10 pages, May 1976.
3. Batill, S. M. and Mueller, T. J., "Flow Visualization of Boundary Layer Transition Using Smoke-Wire Techniques", Bulletin of American Physical Society, Vol. 24, No. 8, 1979.
4. Batill, S. M. and Mueller, T. J., "Visualization of the Laminar Turbulent Transition in the Flow Over an Airfoil Using the Smoke-Wire Technique", AIAA Paper No. 80-0421, 11th Aerodynamic Testing Conference, Colorado Springs, Colorado, March 1980.
5. Mueller, T. J. and Batill, S. M., "Experimental Studies of the Laminar Separation Bubble on a Two-Dimensional Airfoil at Low Reynolds Number", AIAA Paper No. 80-1440, Fluid and Plasma Dynamics Conference, Snowmass, Colorado, 12 pages, July 1980.
6. Batill, S. M., Nelson, R. C., Mueller, T. J., "High Speed Smoke Flow Visualization",Proceedings of the International Symposium on Flow Visualization, Bochum, Germany, pp. 497-501, September 9-12, 1980.
7. Batill, S. M., Nelson, R. C., Mueller, T. J., and Wells, W. C., "Smoke Flow
8. Visualization at Transonic and Supersonic Mach Numbers,", AIAA Paper No. 82-0188, pp. 1-11, January, 1982.
9. Doligalski, T. L, and Batill, S. M., "The Evolution of Unsteady Three-Dimensional Vortex Loops", Bulletin of American Physical Society, Vol. 27, No. 9, 1982.
10. Doligalski, T. L. and Batill, S. M., "The Evolution of Unsteady Three-Dimensional Vortex Loops", Drag Reduction Symposium Abstracts, National Academy of Sciences, Washington, D.C., September 1982.

11. Batill, S M. and Hoffman, J. J., "Aerodynamic Design of High Contraction Ratio, Subsonic Wind Tunnel Inlets", AIAA paper 84-0416, 22nd Aerospace Sciences Meeting, Reno, Nevada, January 1984.
12. Caylor, M. J. and Batill, S. M., "An Experimental Study of High Contraction Ratio, Subsonic Wind Tunnel Inlets", AIAA paper 84-0618-CP, Proceedings of the 13th Aerodynamic Testing Conference, San Diego, California, March 1984.
13. Batill, S. M., Doligalski, T. L., "Three-Dimensional, Unsteady Vortex Loop Dynamics", AIAA paper 85-0444, 23rd Aerospace Sciences Meeting, Reno, Nevada, January 1985.
14. Batill, S. M. and Doligalski, T. L., "Three-Dimensional Vortex Structures in Wall Bounded Flows", 4th International Symposium on Flow Visualization, Paris, France, pp. 1-5, August 1986.
15. Mueller, T. J., Batill, S. M., et. al., "Low Reynolds Number Wind Tunnel Measurements", International Conference on Aerodynamics at Low Reynolds Numbers, October 1986.
16. Batill, S. M., Bacarro, J.M., "Modeling and Identification of Nonlinear Dynamic Systems with Application to Aircraft Landing Gear," AIAA Paper 88-2315, Proceedings of the AIAA 29th Structures, Structural Dynamics and Materials Conference, Williamsburg, VA, pp.871-884, April 1988.
17. Batill, S. M., Hollkamp,J.J., "Parameter Identification of Discrete Time Series Models for Transient Response Prediction," AIAA Paper 88-2231, Proceedings of the AIAA 29th Structures, Structural Dynamics and Materials Conference, Williamsburg, VA, pp.158-166, April 1988.
18. LeMay, S.P.,Batill, S. M., Nelson,R.C., "Leading Edge Vortex Dynamics on Pitching Delta Wing," AIAA Paper 88-2559, Proceedings of the AIAA 6th Applied Aerodynamics Conference, Williamsburg, VA, pp.312-320, June 1988.
19. Batill, S.M., Nelson, R.C., Dunn, P.F., "Unmanned Flight Vehicles - From Concept to Prototype : An Undergraduate Design Experience", AIAA Paper 88-4414, AIAA/AHS/ASEE Aircraft Design, Systems and Operations Conference, Atlanta, Georgia, Sept. 1988.
20. Hollkamp, J.J., Batill, S.M., "An Instrumental Variable Approach to Reduce Noise Bias in Ibrahim's Time Domain Technique," Published in Recent Advances in Control of Nonlinear and Distributed Parameter Systems, Robust Control and Aerospace Applications, Bentsman,J. and Joshi, S., Editors, Dynamics and Control Division of the ASME, DCS-Vol. 10. , pp. 169-173, Chicago, Illinois, November, 1988.
21. Thompson, S.A., Batill, S.M. and Nelson, R.C. " Separated Flow on a Slender Wing Undergoing Unsteady Pitching Motion," AIAA Paper 89-0194, pp. 1-14, AIAA 27th Aerospace Sciences Meeting, Reno, Nevada, Jan. 1989.
22. Hollkamp,J.J., and Batill, S.M., "Time Series Models for Nonlinear Systems," AIAA Paper 89-1197, pp. 362-370, Proceedings of the AIAA 30th Structures, Structural Dynamics and Materials Conference, Mobile, Alabama, April 1989.
23. Hollkamp,J.J., and Batill, S.M., "An Experimental Study of Noise Bias in Discrete Time Series Models," AIAA Paper 89-1193, pp. 317-326, Proceedings of the AIAA 30th Structures, Structural Dynamics and Materials Conference, Mobile, Alabama, April 1989.

24. Nebres, J.V., Batill, S.M., Nelson, R.C., "Wake Studies on Yawed, Stranded Cables," Proceedings of the Conference on Low Reynolds Number Aerodynamics, Notre Dame, Indiana,published in Low Reynolds Number Aerodynamics: Lecture Notes in Engineering , No. 54, Springer-Verlag, Berlin, pp. 433-446, 1989.
25. Walton, S.M., Nelson, R.C., Batill, S.M., "A Comparison of Aerodynamic Characteristics of Half-Span and Full-Span Delta Wings," AIAA Paper 89-2161, AIAA 7th Applied Aerodynamics Conference, Seattle, Washington, August 1989.
26. Howard, W., Jensen, D., and Batill, S., "Design of Unmanned Flight Vehicle Systems for Aerodynamic Data Acquisition," AIAA Paper 89-2110, AIAA/AHS/ASEE Aircraft Design, Systems and Operations Conference, Seattle, Washington, August 1989.
27. Batill, S.M., Nelson, R.C. and Nebres, J.V., "Flow Field Studies on Yawed, Stranded Cables," 5th International Symposium on Flow Visualization, Prague, Czechoslovakia, August 1989.
28. Thompson,S.A., Batill, S.M., and Nelson, R.C.,"Unsteady Surface Pressure Distributions On A Delta Wing Undergoing Large Amplitude Pitching Motions," AIAA Paper 90-0311, 28th Aerospace Sciences Meeting, Reno, Nevada, January 1990.
29. Hollkamp, J.J., Batill, S.M., "A Recursive Algorithm for Discrete Time Domain Parameter Identification," AIAA Paper 90-1221, Dynamic Specialist Conference, Long Beach, CA, April 1990.
30. Howard, W.H., Batill, S.M.. "A Concept Study on the Use of Remotely Piloted, Sub-Scale Aircraft for High Reynolds Number Testing," AIAA Paper 90-1263, 5th Biannual Flight Test Conference, Ontario, CA, May 1990.
31. Thompson, S.A., Batill, S.M., and Nelson, R.C., "Delta Wing Surface Pressures for High Angle of Attack Maneuvers," AIAA Paper 90-2813, Atmospheric Flight Mechanics Conference, Portland, Oregon, August 1990.
32. Arena, A.S., Thompson, S.A., Nelson, R.C. , and Batill, S.M., "Dynamic Surface Pressure Measurements on a Delta Wing Constrained to Pitching or Rolling Motion," NASA High Angle of Attack Technology Conference, Hampton, Virginia, October 1990.
33. Batill, S.M., and Nebres, J.V., " Application of Digital Filtering Techniques to Unsteady Pressure Measurements," AIAA Paper 91-0061, 29th Aerospace Sciences Meeting, Reno, Nevada, January 1991.
34. Swift, R. and Batill, S.M., "Application of Neural Networks to Preliminary Structural Design," AIAA Paper 91-1038, AIAA/ASME/AHS/ASC 32nd Structures, Structural Dynamics and Materials Conference, Baltimore, Maryland, April 1991.
35. Batill, S.M., "Using Prototypes and Flight Validation in Teaching Aerospace Systems Design," SAE Paper 911176, Society of Automotive Engineers, 1991 Aerospace Atlantic Meeting, Dayton, Ohio, April 1991.
36. Batill, S.M., Nebres, J.V., "Data Correction for Pressure Transmission Lines Using Discrete Time Series Models," 14th ICIASF Meeting, Rockville, Maryland, October, 1991.
37. Swift, R.A. and Batill, S.M., "A Recursive Learning Approach for Neural Networks in Preliminary Structural Design," (Invited Paper) 28th Annual Technical Meeting, Society of Engineering Science, Gainesville, Florida, November 1991.

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"Being More Certain about Experimental Uncertainty," 31st Annual Subsonic Aerodynamic Testing Association, Chrysler Technical Center, Auburn Hills Michigan, June 1995.

"An Investigation of the Total Least Squares Criteria in Time Domain Based Parameter Identification for Flight Flutter Testing," AIAA/ASME/ASCE/ AHS/ASC 36th Structures, Structural Dynamics and Materials Conference, New Orleans, Louisiana, April 1995.

"Optimization of Mixed Discrete/Continuous Design Variable Systems using Neural Networks," 5th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Panama City, Florida, September 1994.

"Experimental Uncertainty and Wind Tunnel Measurements" 81st Semiannual Meeting, Supersonic Tunnel Association, Buffalo New York, April 1994.

"Design, Installation and Calibration of an Anechoic Wind Tunnel," 29th Annual Subsonic Aerodynamic Testing Association Meeting, Pforzheim, Germany, June 1993.

"Structural Design Space Definition Using Neural Networks and a Reduced Knowledge Base," AIAA/AHS/ASEE Aerospace Design Conference, Irvine, California, February 1993.

"System Design Projects for Undergraduate Design Education," AIAA/AHS/ASEE Aerospace Design Conference, Irvine, California, February 1993.

"Flow around a Cylinder with Helical Surface Perturbations,"6th International Symposium on Flow Visualization, Yokahama, Japan, October 1992.

"Lessons Learned in Teaching Aerospace Systems Design," 1992 Illinois/Indiana Section Annual Conference, Notre Dame, Indiana, March 1992.

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"Flow about Cylinders with Helical Surface Protrusions," 30th Aerospace Sciences Meeting, Reno, Nevada, January 1992.

"Data Correction for Pressure Transmission Lines Using Discrete Time Series Models," 14th International Congress on Instrumentation in Aerospace Simulation Facilities, Rockville, Maryland, October 1991.

"Application of Digital Filtering Techniques to Unsteady Pressure Measurements," 29th Aerospace Sciences Meeting, Reno, Nevada, January 1991.

"Time Domain Corrections For Remote, Unsteady Surface Pressure Measurements," 26th Subsonic Aerodynamic Testing Association Meeting, Turin, Italy, May 1990.

"Flow Field Studies on Yawed, Stranded Cables," 5th International Symposium on Flow Visualization, Prague, Czechoslovakia, August 1989.

"Time Series Models for Nonlinear Systems," AIAA 30th Structures, Structural Dynamics and Materials Conference, Mobile, Alabama, April 1989.

"An Experimental Study of Noise Bias in Discrete Time Series Models," AIAA 30th Structures, Structural Dynamics and Materials Conference, Mobile, Alabama, April 1989.

"Applications of Remotely Piloted Vehicles for Aerodynamic Data Acquisition", USRA Advanced Aeronautics Design Winter Conference, Santa Clara, California, January 1989.

"Modeling and Identification of Nonlinear Dynamic Systems with Application to Aircraft Landing Gear", AIAA 29th Structures, Structural Dynamics and Materials Conference, Williamsburg, Virginia, April 1988.

"Modal Analysis and Testing", ASME Spring National Design Engineering Show and Conference, Chicago, Illinois, March 1988.

"Three Dimensional, Unsteady Vortex Loop Dynamics", AIAA 23rd Aerospace Sciences Meeting, Reno, Nevada, January 1985.

"Aerodynamic Design of High Contraction Ratio, Subsonic Wind Tunnel Inlets," 22nd AIAA Aerospace Sciences Meeting, Reno, NV, January 1984.

"High Contraction Ratio Wind Tunnel Inlet Design" 59th Semi-Annual Supersonic Aerodynamic Testing Association Meeting, Colorado Springs, CO, April 1982.

"Smoke Flow Visualization at Transonic and Supersonic Speeds," 20th AIAA Aerospace Sciences Meeting, Orlando, FL, January 1981.

"Supersonic Tunnel Inlet Performance," 56th Semi-Annual Supersonic Aerodynamic Testing Association Meeting, Cambridge, MA, October 1981.

"High Speed Smoke Flow Visualization," 54th Semi-Annual Supersonic Aerodynamic Testing Association Meeting, New York, NY, October 1980.

"Experimental Studies of the Laminar Separation Bubble on a Two-Dimensional Airfoil at Low Reynolds Number," AIAA 13th Fluid and Plasma Dynamics Conference, Snowmass, CO, July 1980.

"Road Vehicle Aerodynamic Stability," Subsonic Aerodynamic Testing Association, Warren, MI, June 1980.

"Visualization of the Laminar-Turbulent Transition in the Flow over an Airfoil using the Smoke-Wire Technique," AIAA Aerodynamic Testing Conference, Colorado Springs, CO, March 1980.

"Flow Visualization of Boundary Layer Transition Using the Smoke Wire Technique," 32nd Meeting of the American Physical Society, Notre Dame, IN, November 1979.

Invited Seminars and Talks

"The Ultimate Tour of IDEO: Reflections of a Scholar-in-Residence," IDEO Chicago, Oct. 2009.

"Reflections on the Ultimate Tour of IDEO," 40th Anniversary Top Ten Talk, Industrial Design Engineering School, Technical University Delft, Netherlands, Feb. 2009.

"The Ultimate Tour of IDEO: Reflections of a Scholar-in-Residence," IDEO KnowHow, Palo Alto, California, Dec. 2008.

"Team-based, Project-Oriented Capstone Design Experiences in Engineering," School of Aeronautics and Astronautics, Purdue University, Lafayette, Indiana, Feb. 1998.

" Applications of Mixed Continuous/Discrete Optimization Methods and the Concurrent Subspace Design Framework ," NASA Langley Research Center, Hampton, Virginia, Dec. 1997

Multidisciplinary Design Optimization- Concurrent Subspace Optimization using Artificial Neural Network Response Surfaces," NASA Langley Research Center, Hampton, Virginia, Jan. 1997

"Coordination of Discipline Specialists in Non-Hierarchic System Design " Imperial College of Science, Technology and Medicine, London, England, Nov. 1996.

"Coordination of Discipline Specialists in Non-Hierarchic System Design " University of Cardiff, Wales, United Kingdom, Nov. 1996.

"Introducing the Product Realization Process in the Undergraduate Curriculum: From Mission Definition to Flight Validation," Royal Institute of Technology , Stockholm, Sweden, Mar. 1996.

"Coordination of Discipline Specialists in Multidisciplinary Design Optimization," FFA, Aeronautical Research Institute of Sweden, Stockholm, Sweden, Mar. 1996.

"Experimental Uncertainty and Large-Scale Wind Tunnel Facilities," FFA, Aeronautical Research Institute of Sweden, Stockholm, Sweden, Mar. 1996.

"Multidisciplinary Design Optimization- An Application of Concurrent Subspace Optimization," NASA Langley Research Center, Hampton, Virginia, Oct. 1995

"Multidisciplinary Design Optimization Framework for Education and Research" Boeing Commercial Airplane Group, Seattle, Washington, August 1995.

"Time Domain Based Parameter Identification for Flight Flutter Testing," McDonnell Douglas Corporation, St. Louis, Missouri, June 1995.

"A Framework for Aerospace Systems Design Education," McDonnell Douglas Corporation, St. Louis, Missouri, June 1995.

"Multidisciplinary Design Optimization and the Design of Mixed Continuous Discrete Systems Using Response Surface Mapping", Department of Mechanical and Aeronautical Engineering, Western Michigan University, March 1995.

"Technology Development for Multidisciplinary Design Optimization," NASA Langley Research Center, Hampton, Virginia, Oct. 1994

"Neural Network Applications in Structural Design," Wright-Patterson Air Force Base, Dayton, Ohio, February 1994.

"Application of Neural Networks to Preliminary Structural Design" Structural Dynamics Division Seminar, NASA Langley Research Center, Hampton, Virginia, November 1993.

"Experimental Uncertainty and Drag Measurements in Wind Tunnels" ( A series of 8 one-hour -lectures) NASA Langley Research Center, Hampton, Virginia, August - December 1993.

"Application of Finite Element Analysis to Flight Vehicle Preliminary Structural Design," Flight Dynamics Directorate, Wright-Patterson Air Force Base, Ohio, May 1993.

"Flow About Cylinders with Large-Scale Surface Protrusions," Third ONR Workshop on Vortex Shedding and Vortex Wakes, Ohio State University, May 1992.

"Flow Field Studies on Stranded Cables," Naval Coastal Systems Center, Panama City, FL, October 1991.

"Automated Processing of Flutter Test Data," Vehicle Technology Branch of the NASA Dryden Flight Research Center, Edwards AFB, CA, October 1991.

"Using ASTROS in Preliminary Structural Design" Flight Dynamics Directorate, Wright Patterson Air Force Base, OH, August 1991.

"A Digital Data Processing Procedure for Correcting Unsteady Surface Pressure Measurements," Mechanical and Aerospace Engineering Seminar, Illinois Institute of Technology, Chicago, IL, March 1991.

"Parameter Identification and Discrete Time Series Models", Vehicle Technology Branch, Dryden Flight Research Facility, Edwards AFB, CA, October 1990.

"Surface Pressure Distributions and Near Wake Structure on Yawed, Stranded Cables," Naval Coastal Systems Center, Panama City, FL, August 1990.

"Finite Element Methods in Preliminary Structural Design," Structures and Dynamics Division of the Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, OH, July 1990.

"Surface Pressure Measurements on Stranded Cables," Naval Ocean Systems Center, San Diego, CA, April 1990.

"Unsteady Aerodynamics of Delta Wings at High Angle of Attack," National Aeronautics Laboratory, NLR, Amsterdam, Holland, August 1989.

" Discrete Time Series Models for Structural Response Prediction," Bayerische Motoren Werke, BMW, Munich, Germany, August 1989.

"Remotely Piloted or Autonomous Flight Vehicle Systems", NASA Headquarters, Washington DC, February 1989.

"Vortex Dynamics of Highly Swept Wings Undergoing Unsteady Motions", NASA Langley Research Center, Hampton VA, January 1989.

"Flow Field Measurement for Stranded Cables", Naval Costal Systems Center, Panama City, Florida, October 1988.

"Time Series Model Identification for Transient Response Prediction", Wright Aeronautical Laboratories, Ohio, September 1988.

"Research Programs in Aerospace Engineering", Boeing Commercial Airplane Company, Seattle, Washington, June 1988.

"Application of Remotely Piloted Vehicles in Aircraft Design," Department of Aeronautics and Astronautics, Purdue University, February 1988.

"Flow Visualization of a 70° Delta Wing Undergoing Pitching Oscillations and Step Inputs", NASA Langley Research Center, Hampton, Virginia, December 1987.

"Experimental Studies on Unsteady Delta Wings", Ohio State University, Columbus, OH, September 1987.

"Linear and Nonlinear Methods in Structural Parameter Identification", Air Force Wright Aeronautical Laboratories, Ohio, September 1987.

"Model Design and Facility Development for Unsteady Delta Wing Aerodynamics," NASA Langley Research Center, Hampton, VA, May 1987.

"Ethics in Engineering Education," Calvin College, Grand Rapids, MI, November 1986.

"Application of FFT to Transient Dynamic Data and Structural Parameter Estimation", Air Force Wright Aeronautical Laboratories, Ohio, April 1986.

"Design of Three Dimensional Wind Tunnel Inlets", Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, OH, August 1985.

"Influence of Surface Roughness on Airfoil Aerodynamic Characteristics," NASA Lewis Research Center, Cleveland, OH, August 1984.

"Experimental Studies of Vortex Loops in Uniform Flows," Michigan State University, East Lansing, MI, March 1983.

"Influence of Boundary Layer Transition on Low Speed Aerodynamic Characteristics," General Motors Research Lab, Warren, MI, September 1982.

"Modeling of Nonlinear Gear Systems for Transient Response Prediction", Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio, January 1982.

"Modeling of Nonlinear Oleo-pneumatic Landing Gear Systems," Cleveland Pneumatic Corp., Cleveland, OH, July 1981.

"Flow Visualization and Low Reynolds Number Airfoil Aerodynamics'" NASA Lewis Research Center, October 1979.