

CURRICULUM VITAE - MARK D. MAUGHMER, Ph.D.

Professor of Aerospace Engineering  
The Pennsylvania State University  
University Park, Pennsylvania 16802

EDUCATIONAL BACKGROUND

University of Illinois, Urbana, Illinois

Ph.D., Aeronautical and Astronautical Engineering, 1983.

Dissertation: "Trailing Edge Flow Conditions as a Factor in Airfoil Design"

Princeton University, Princeton, New Jersey

M.S.E., Aerospace and Mechanical Sciences, 1975.

Thesis: "The Development of a Reciprocating, Wind-Driven, Mechanical-Power Generator"

University of Illinois, Urbana, Illinois

B.S., Aeronautical and Astronautical Engineering, 1972.

PROFESSIONAL EXPERIENCE

January 1984 - Present

Assistant Professor, 1984-1991; Associate Professor, 1991-2001;

Professor, 2001-Present

Department of Aerospace Engineering

The Pennsylvania State University, University Park, Pennsylvania

Courses Taught: Aeronautics, theoretical aerodynamics, fluid dynamics, aircraft design, engineering mathematics, aerodynamics laboratory, wing theory, aircraft stability and control.

Research Activities: Airfoil design, analysis, and testing. Wing planform optimization.

Wing/fuselage junction geometries for drag reduction. Low Reynolds number

aerodynamics. Natural laminar flow aerodynamics. Aerodynamics of flight controls.

Winglet design for fixed-wing aircraft and wind turbines. Wind-tunnel measurements on airfoils for aircraft, rotorcraft and wind turbines. Performance enhancement of rotorcraft.

University Activities: Senior Member, Graduate Faculty; Faculty Senate, Committee on

Undergraduate Instruction; College Faculty Council, Undergraduate Studies Committee;

College Sabbatical Leave Committee; Penn State Soaring Club (faculty advisor).

Departmental Activities: Sigma Gamma Tau (faculty advisor). American Institute of Aeronautics

and Astronautics (faculty advisor). Departmental Seminar Coordinator. Committee

participation: New Faculty Search; Scholarship; Undergraduate Curriculum; Space and

Facility Planning; Laboratory Facilities and Safety; Graduate Academic Affairs; Strategic Planning.

August 2005 – August 2006 (Sabbatical Leave)

Visiting Professor

Department of Aerospace Engineering and Engineering Mechanics

The University of Texas at Austin, Austin, Texas

Summer 2004

Boeing A.D. Welliver Summer Faculty Fellow

Boeing Commercial Airplane Division, Seattle, WA

## PROFESSIONAL EXPERIENCE (cont'd)

September 1993-July 1994 (Sabbatical Leave)

Visiting Research Scientist

DLR-Braunschweig, Germany

Institute of Design Aerodynamics

Research Activity: Design and wind-tunnel testing of an airfoil using suction for laminar flow control.

Summer 1985, 1986

NASA/ASEE Summer Faculty Fellow

NASA-Langley Research Center, Hampton, Virginia

Transonic Aerodynamics Division, Airfoil Aerodynamics Branch

Research Activity: Design of an airfoil for a high-altitude, long-endurance flight vehicle (UAV).

August 1977-December 1983

Graduate Research/Teaching Assistant

Department of Aeronautical and Astronautical Engineering

University of Illinois, Urbana, Illinois

Research Concentration: Analytical and numerical work directed toward airfoil design and development.

Summer 1978

Visiting Research Engineer, Vortex Research Facility

NASA-Langley Research Center, Hampton, Virginia

Research Activity: Experimental program that explored the particle deposition patterns from agricultural aircraft.

June 1974-August 1977

Research Engineer, Professional Research Staff, Flight Mechanics

Laboratory and Advanced Flight Concepts Laboratory

Department of Aerospace and Mechanical Sciences

Princeton University, Princeton, New Jersey

Research Activities: Analytical and experimental efforts directed toward modern LTA (lighter-than-air) aircraft. Experimental program involving high-speed, tracked ground vehicles. Analytical, wind-tunnel, and full-scale programs to develop the Princeton Sailwing for use on aircraft, sailboats, and windmills.

September 1972-May 1974

Graduate Assistant in Research/Teaching

Advanced Flight Concepts Laboratory

Department of Aerospace and Mechanical Sciences

Princeton University, Princeton, New Jersey

Research Activities: Investigation examining the aerodynamic characteristics of numerous wind-energy machines. Flight-test program concerned with aircraft handling qualities.

## CONSULTING ACTIVITIES

Schempp-Hirth Flugzeugbau GmbH, Kirchheim/Teck, Germany

Designed winglets for production, high-performance sailplanes, Ventus 2ax, Ventus 2bx, Ventus 2cx, Discus 2b, Discus 2c, Duo-Discus, Arcus, Quintus, 2001-Present.

M&H Soaring, Incorporated, Elmira, NY

Collaborative research program to design, test, and manufacture winglets for racing sailplanes, 1994-Present.

## CONSULTING ACTIVITIES (cont'd)

Airfoils, Incorporated, State College, PA  
Collaborative airfoil design and testing activities, 1989-Present.

Hogan Lovells US LLP, Houston, TX  
Expert witness/consultant for patent dispute involving winglets, 2011-Present.

Aerobatic Display Ltd., Oxfordshire, United Kingdom  
Designed winglets and conceived performance improvements for MXS aircraft of Breitling Red Bull Air Racing Team, 2008-2009.

Fried, Frank, Harris, Schriver and Jacobson, LLP, Washington, D.C.  
Expert witness/consultant for a patent dispute involving winglets, 2009.

The Insitu Group, Bingen, WA  
Aircraft design activities in support of uninhabited air vehicle product development, 2005-2006.

Flugtechnik and Leichbau, Braunschweig, Germany  
Designed winglets for the world's largest high-performance sailplane, Eta, 2005.

General Electric Corporation, Wind-Energy Division, Greenville, SC  
Participated in the design of winglets for wind turbines, 2004.

Naval Research Laboratory, Alexandria, VA  
Conducted wind-tunnel tests on an airfoil for use on a folding-wing unmanned-air vehicle, 2004.

AdvanTek International, Boothwyn, PA  
Conducted wind-tunnel experiments on a circulation-controlled airfoil for wind turbine applications, 2002-2003.

National Renewable Energy Laboratory, Golden, CO  
Reviewed a series of technical papers, 2002.

Schweizer Aircraft Corporation, Elmira, NY  
Analyzed and made recommendations regarding the airfoil for the SAC 2-37A aircraft, 1993-1994. Designed winglets and tip extensions for the SAC 2-37A, 1995. Made recommendations regarding airfoil for SAC 2-38, 1999.

SSE Incorporated, Pennsauken, NJ  
Assisted with design and performance calculations for an autonomous paraplane delivery system, 1998-1999.

Groen Brothers Aviation, Salt Lake City, UT  
Defined aerodynamic characteristics for the design of a gyroplane rotor airfoil, 1996-1999.

Raspet Flight Research Laboratory, Mississippi State University, Starkville, MS  
Provided assistance for business-jet winglet design activities, 1996.

FloWind Corporation, San Rafael, CA  
Made wind-tunnel measurements of wind-turbine airfoils, 1995.

Field Aviation, Inc., Toronto, Canada  
Designed and supervised wind-tunnel tests of ski and strut fairings for use on a DeHavilland DHC-7 aircraft, 1991.

CONSULTING ACTIVITIES (cont'd)

New Composite Matrix Designs, Friedens, PA  
Involved in the design of four-place, turbojet-powered aircraft, 1991-1993.

Anadrill/Schlumberger, Sugar Land, TX  
Involved in the design of a small power-generating turbine, 1990.

Metatron, Ltd, Wyckoff, NJ  
Performed conceptual design studies for a hovering vehicle, 1990.

Performance Enhancement, Inc., Katy, TX  
Designed airfoil section for sailplane winglet applications, 1990.

NASA-Langley Research Center, Hampton, VA  
Participated in Low-Turbulence Pressure Tunnel tests of an airfoil designed for high-altitude, long-endurance missions, 1987.

McCaughey Accessory Division, Cessna Aircraft Company, Dayton, OH  
Performed analytical propeller section studies, 1980.

Princeton Combustion Research Laboratories, Princeton, NJ  
Contributed to research effort concerning the use of wind energy for agricultural application, 1979.

All American Engineering Company, Wilmington, DE  
Participated in fabricating a 40 ft. span, hybrid balloon/helicopter (AEROCRANE) flight test model, 1977.

#### PROFESSIONAL AFFILIATIONS, HONORARY AFFILIATIONS, AND AWARDS

American Institute of Aeronautics and Astronautics  
Associate Fellow, 2002  
Aircraft Design Technical Committee, 1987-1990  
Chairman, 2012-2013, Vice-Chairman, 2010-2012, Central Pennsylvania Professional Section  
Session Chairman: AIAA Aircraft Design and Operations Meeting, 1989 AIAA/FAA General Aviation Systems Meeting, 1990; AIAA/ICAS International Air and Space Symposium and Exposition, 2003; AIAA Aerospace Sciences Meeting, 2008  
Reviewer: *AIAA Journal*; *AIAA Journal of Aircraft*; *AIAA Journal of Guidance, Control, and Dynamics*; *AIAA Journal of Aerospace Computing, Information, and Communication*  
Technical Judge: National Student Paper Competition, 1985, 1989; General Dynamics Team Aircraft Design Competition, 1988, 1989  
Sustained Service Award, 2010  
AIAA/ASEE John Leland Atwood Award, 2013

American Society of Engineering Education  
Session Chairman: ASEE Annual Conference, 1993, 1998-2009  
Aerospace Engineering Division, Executive Board, 1994-1999  
Aerospace Engineering Division Distinguished Service Award, 2006  
Fred Merryfield Engineering Educator Design Award, 2009

Organization Scientifique et Technique Internationale du Vol a Voile (OSTIV)  
Member of Board, 1997-Present  
U.S. Representative, 1997-Present  
Technical Chairman, 1999-Present  
Special Recognition Award, 2008  
Technical Editor, *Journal of Technical Soaring*, 2002-Present

#### PROFESSIONAL AFFILIATIONS, HONORARY AFFILIATIONS, AND AWARDS (cont'd)

American Helicopter Society  
 Aerodynamics Technical Committee, 2000-2002  
 Reviewer: *Journal of the American Helicopter Society*

Royal Aeronautical Society  
 Reviewer: *The Aeronautical Journal*

Experimental Aircraft Association  
 Sigma Xi (Scientific Research Honorary)  
 Tau Beta Pi (Engineering Honorary)  
 Phi Kappa Phi (General Scholastic Honorary)  
 Soaring Society of America  
 Technical Board Chairman, Configuration and Design, 1990-Present  
 Board of Directors, Collegiate Soaring Association, 1990-Present  
 Contributing Editor, *Soaring*, 2003-2006  
 Exceptional Service Award, 1991, 2004

University of Illinois, Department of Aeronautical and Astronautical Engineering: Outstanding Young  
 Alumnus Award, 1992

Penn State Alumni Association  
 Alumni Faculty Teaching Fellow Award, 2012

Penn State Engineering Society:  
 Outstanding Teaching Award, 1993  
 Premier Teaching Award, 2001

NASA Group Achievement Award, Heavy Lift Helicopter Investigation Team, 2007  
 Reviewer: *Aerospace Science and Technology; Journal of Aerospace Engineering and Technology; Wind  
 Energy; Experiments in Fluids; International Journal of Energy Research; International  
 Journal of Green Energy; Chinese Journal of Aeronautics*

Biographical listing in:  
 Marquis Who's Who in the East  
 Dictionary of International Biography  
 International Men of Achievement  
 Marquis Who's Who of Emerging Leaders in America  
 Marquis Who's Who in American Education  
 Marquis Who's Who in Science and Engineering

#### REFEREED JOURNAL PUBLICATIONS AND CONFERENCE PROCEEDINGS

- Coder, J.G., Maughmer, M.D., and Somers, D.M., "Theoretical and Experimental Results for the S414, Slotted, Natural-Laminar-Flow Airfoil," submitted for publication, *Journal of Aircraft*, Aug. 2013.
- Coder, J.G. and Maughmer, M.D., "CFD Compatible Transition Modeling Using an Amplification Factor Transport Equation," accepted for publication, *AIAA Journal*, Sept. 2013.
- Cole, J.A., Vieira, B.A.O., Coder, J.G., Premi, A., and Maughmer, M.D., "An Experimental Investigation into the Effects of Gurney Flaps on Various Airfoils," *Journal of Aircraft*, Vol. 50, No. 4, July-Aug. 2013, pp. 1287-1294.
- Maughmer, M.D. and Coder, J.G., "Comparisons of Theoretical Methods for Predicting Airfoil Aerodynamic Characteristics," accepted for publication, *Journal of Aircraft*, March 2013.
- Kinzel, M.P., Maughmer, M.D., and Duque, E.P.N., "Numerical Investigation on the Aerodynamics of Oscillating Airfoils with Deployable Gurney Flaps," *AIAA Journal*, Vol. 48, No. 7, July 2010, pp. 1457-1469.

#### REFEREED JOURNAL PUBLICATIONS AND CONFERENCE PROCEEDINGS (cont'd)

- Maughmer M.D. and Bramesfeld, G., "Experimental Investigation of Gurney Flaps," *Journal of Aircraft*, Vol.

45, No. 6, Nov.-Dec. 2008, pp. 2062-2067.

Bramesfeld, G. and Maughmer, M.D., "The Effects of Wake Rollup on Formation-Flight Aerodynamics," *Journal of Aircraft*, Vol. 45, No. 4, July-August 2008, pp. 1167-1173.

Bramesfeld, G. and Maughmer, M.D., "A Free-Wake, Lifting-Surface Model Using Distributed Vorticity Elements," *Journal of Aircraft*, Vol. 45, No. 2, March-April 2008, pp. 560-568.

Otani, I. and Maughmer, M.D., "The Conceptual Design of a Tailless Sailplane Having a Stabilizing Fuselage," *Technical Soaring, An International Journal*, Vol. 31, No. 3, July 2007, pp. 79-89.

Maughmer, M., Lesieutre, G., and Kinzel, M.P., "Miniature Trailing-Edge Effectors for Rotorcraft Performance Enhancement," *Journal of the American Helicopter Society*, Vol. 52, No. 2, April 2007, pp. 146-158.

Bramesfeld, G., Maughmer, M.D., and Willits, S.M., "Piloting Strategies for Controlling a Transport Aircraft after Vertical-Tail Loss," *Journal of Aircraft*, Vol. 43, No. 1, Jan.-Feb. 2006, pp. 216-225.

Maughmer, M.D., "The Evolution of Sailplane Wing Design," AIAA Paper 2003-2777. Reprinted in *Technical Soaring, An International Journal*, Vol. 27, No. 3 and 4, July and Oct. 2003, printed Feb. 2006, pp. 75-86.

Maughmer, M.D., "The Design of Winglets for High-Performance Sailplanes," *Journal of Aircraft*, Vol. 40, No. 6, Nov.-Dec. 2003, pp. 1099-1106. Reprinted in *Technical Soaring, An International Journal*, Vol. 27, No. 1 and 2, Jan. and April 2003, printed Oct. 2005, pp. 44-53.

Maughmer, M.D., Swan, T.J., and Willits, S.M., "The Design and Testing of a Winglet Airfoil for Low-Speed Aircraft," *Journal of Aircraft*, Vol. 39, No. 4, July-Aug. 2002, pp. 654-661. Reprinted in *Technical Soaring, An International Journal*, Vol. 26, No. 3, July 2002, printed March 2005, pp. 76-88.

Bramesfeld, G. and Maughmer, M.D., "An Experimental Investigation of Self-Actuating, Upper-Surface, High-Lift-Enhancing Effectors," *Journal of Aircraft*, Vol. 39, No. 1, Jan.-Feb. 2002, pp. 120-124.

Maughmer, M.D. and Kunz, P.J., "Sailplane Winglet Design," *Technical Soaring*, Vol. 22, No. 4, Oct. 1998, pp. 116-123.

Selig, M.S., Maughmer, M.D., and Somers, D.M., "A Natural Laminar Flow Airfoil for General Aviation Applications," *Journal of Aircraft*, Vol. 32, No. 4, July-Aug. 1995, pp. 710-715.

Dini, P. and Maughmer, M.D., "A Locally Interactive Laminar Separation Bubble Model," *Journal of Aircraft*, Vol. 31, No. 4, July-Aug. 1994, pp. 802-810.

Maughmer, M., Ozoroski, L., Straussfogel, D., and Long, L., "Validation of Engineering Methods for Predicting Hypersonic Vehicle Controls Forces and Moments," *Journal of Guidance, Control, and Dynamics*, Vol. 16, No. 4, July-Aug. 1993, pp. 762-769.

Selig, M.S. and Maughmer, M.D., "Generalized Multi-Point Inverse Airfoil Design," *AIAA Journal*, Vol. 30, No. 11, Nov. 1992, pp. 2618-2625.

Dini, P., Selig, M.S., and Maughmer, M.D., "A Simplified Transition Prediction Method for Separated Boundary Layers," *AIAA Journal*, Vol. 30, No. 8, Aug. 1992, pp. 1953-1961.

#### REFEREED JOURNAL PUBLICATIONS AND CONFERENCE PROCEEDINGS (cont'd)

Somers, D.M. and Maughmer, M.D., "The SM701 Airfoil, an Airfoil for World Class Sailplanes," *Technical*

*Soaring*, Vol. 16, No. 2, July 1992, pp. 70-77

- Selig, M.S. and Maughmer, M.D., "A Multi-Point Inverse Airfoil Design Method Based on Conformal Mapping," *AIAA Journal*, Vol. 30, No. 5, May 1992, pp. 1162-1170.
- Dini, P. and Maughmer, M.D., "A Computationally Efficient Modelling of Laminar Separation Bubbles," *Low Reynolds Number Aerodynamics*, Lecture Notes in Engineering, 54, T. J. Mueller (editor), Springer-Verlag, Heidelberg, 1989, pp. 174-188.
- Maughmer, M., Hallman, D., Ruszkowski, R., Chappel, G., and Waitz, I., "An Experimental Investigation of Wing/Fuselage Integration Geometries," *Journal of Aircraft*, Vol. 26, No. 8, Aug. 1989, pp. 705-711.
- Maughmer, M.D. and Somers, D.M., "Design and Experimental Results for a High-Altitude, Long-Endurance Airfoil," *Journal of Aircraft*, Vol. 26, No. 2, Feb. 1989, pp. 148-153.
- Maughmer, M.D. and Somers, D.M., "The Design of an Airfoil for a High-Altitude, Long-Endurance Remotely Piloted Vehicle," NASA Symposium on Natural Laminar Flow and Laminar Flow Control Research, NASA CP-2487, Vol. 3, Sept. 1987, pp. 777-794.
- Ormsbee, A.I. and Maughmer, M.D., "A Class of Airfoils Having Finite Trailing Edge Pressure Gradients," *Journal of Aircraft*, Vol. 23, No. 2, Feb. 1986, pp. 97-103.
- Maughmer, M.D. and Selig, M.S., "Low Reynolds Number Airfoil Design," *The Proceedings of the Conference on Low Reynolds Number Airfoil Aerodynamics*, UNDAS CP-77B123, University of Notre Dame, June 1985, pp. 15-26.
- Ormsbee, A.I., Bragg, M.B., Maughmer, M.D., and Jordan, F.L., "Scaling Wake-Particle Interactions for Aerial Applications Research," *Journal of Aircraft*, Vol. 18, No. 7, July 1981, pp. 592-596.
- Maughmer, M.D., "A Comparison of the Aerodynamic Characteristics of Eight Sailing Airfoil Sections," NASA/SSA Science and Technology of Low-Speed and Motorless Flight, NASA CP-2085, March 1979, pp. 155-176.

#### SELECTED CONFERENCE PAPERS, PRESENTATIONS, AND REPORTS

- Pipenberg, B.T. and Maughmer, M.D., "Experimental Analysis of Power Requirements for Fixed-, Flapping-, and Rotary-Wing Micro Air Vehicles," accepted for presentation, AIAA Science and Technology Forum and Exposition, National Harbor, MD, Jan. 13-17, 2014.
- Coder, J.G., Maughmer, M.D., and Somers, D.M., "Theoretical and Experimental Results for the S414, Slotted, Natural-Laminar-Flow Airfoil," AIAA Paper 2013-2655, 31<sup>st</sup> AIAA Applied Aerodynamics Conference, San Diego, CA, June 24-27, 2013.
- Kody, F. Maughmer, M.D., Schmitz, S, "Non-Harmonic Deployment of Active Devices for Rotor Performance Enhancement," American Helicopter Society International 69<sup>th</sup> Annual Forum, Phoenix, AZ, May 21-23, 2013.
- Coder, J.G. and Maughmer, M.D., "A CFD-Compatible Transition Model Using an Amplification Factor Transport Equation," AIAA Paper 2013-0253, 51<sup>st</sup> Aerospace Sciences Meeting, Grapevine, TX, Jan. 7-10, 2013.

#### SELECTED CONFERENCE PAPERS, PRESENTATIONS, AND REPORTS (cont'd)

- Coder, J.G. and Maughmer, M.D., "Numerical Validation of the Squire-Young Formula for Profile Drag Prediction," AIAA Paper 2013-0966, 51<sup>st</sup> Aerospace Sciences Meeting, Grapevine, TX, Jan. 7-10,

2013.

- Cole, J.A., Maughmer, M.D., and Bramesfeld, G., "Aerodynamic Design Considerations for Tiltrotor Wing Extensions and Winglets," AIAA Paper 2013-1088, 51<sup>st</sup> Aerospace Sciences Meeting, Grapevine, TX, Jan. 7-10, 2013.
- Vieira, B.O.A. and Maughmer, M.D., "An Evaluation of Dynamic Stall Onset Prediction Methods for Rotorcraft Airfoil Design," AIAA Paper 2013-1093, 51<sup>st</sup> Aerospace Sciences Meeting, Grapevine, TX, Jan. 7-10, 2013.
- Coder, J.G. and Maughmer, M.D., "Computational Methods in Sailplane Design," XXXI OSTIV Congress, Uvalde, TX, Aug. 8-16, 2012.
- Choephel, T., Coder, J.G., and Maughmer, M.D., "Boundary-Layer Flow Control on the S903 Airfoil Using Fluidic Oscillators," AIAA Paper 2012-2655, 30<sup>th</sup> AIAA Applied Aerodynamics Conference, New Orleans, LA, June 25-28, 2012.
- Coder, J.G. and Maughmer, M.D., "One-Equation Transition Closure for Eddy-Viscosity Turbulence Models in CFD," AIAA Paper 2012-0672, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, Jan. 9-12, 2012.
- Maniaci, D.C. and Maughmer, M.D., "Winglet Design for Wind Turbines Using a Free-Wake Vortex Analysis Method," AIAA Paper 2012-1158, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, Jan. 9-12, 2012.
- Premi, A., Maughmer, M.D., and Brophy, C., "Flow Quality Measurements and Qualification of The Pennsylvania State University Low-Speed, Low-Turbulence Wind Tunnel," AIAA, Paper 2012-1214, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, Jan. 9-12, 2012.
- Maughmer, Mark D., "Aerodynamics Education at Penn State University," Invited Oral Presentation, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, Jan. 9-12, 2012.
- Coder, J.G., Vieira, B.A.O., and Maughmer, M.D., "Development of an Unsteady Aerodynamic Model for Upstream Miniature Trailing-Edge Effectors," American Helicopter Society International 67<sup>th</sup> Annual Forum, Virginia Beach, VA, May 2011.
- Palacios, J., Kinzel, M.P., Overmeyer, A., Szefi, J., Smith, E.C., and Maughmer, M.D., "A Comparison of Active Gurney Flaps and Trailing-Edge Flaps for Rotorcraft," American Helicopter Society International 67<sup>th</sup> Annual Forum, Virginia Beach, VA, May 2011.
- Cole, J.A., Vieira, B.A.O., Coder, J.G., Premi, A., and Maughmer, M.D., "An Experimental Investigation into the Effects of Gurney Flaps on Various Airfoils," AIAA Paper 2011-1250, 49<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando FL, Jan. 4-7, 2011.
- Coder, J.G., Maughmer, M.D., and Martin, P.B., "CFD Investigation of Unsteady Rotorcraft Airfoil Aerodynamics: MiTEs and Dynamic Stall," AIAA Paper 2011-1125, 49<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando FL, Jan. 4-7, 2011.
- Vieira, B.A.O., Kinzel, M.P., and Maughmer, M.D., "Unsteady Aerodynamics of Miniature Trailing-Edge Effectors Based on Indicial Methods," AIAA Paper 2011-1049, 49<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando FL, Jan. 4-7, 2011.

#### SELECTED CONFERENCE PAPERS, PRESENTATIONS, AND REPORTS (cont'd)

- Basom, B.J. and Maughmer, M.D., "Inviscid Analysis of Horizontal-Axis Wind Turbines Using Distributed Vorticity Elements," AIAA Paper 2011-0539, 49<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando FL, Jan. 4-7, 2011.



- Cole, J.A., Maughmer, M.D., and Jackson, K.L., "Structures Education Within the Penn State Flight Vehicle and Fabrication Course," (Invited), AIAA Paper 2011-1012, 49th AIAA Aerospace Sciences Meeting, Orlando FL, Jan. 4-7, 2011.
- Cole, J.A., Maughmer, M.D., and Schmidt, K.J., "The Flight Vehicle Design and Fabrication Course: Two Decades of Project-Based Learning at Penn State," (Invited), AIAA Paper 2010-9153, 10<sup>th</sup> AIAA Aviation Technology, Integration, and Operations Conference, Fort Worth, TX, Sept. 13-15, 2010.
- Maughmer, M.D. and Coder, J.G., "Comparisons of Theoretical Methods for Predicting Airfoil Aerodynamic Characteristics," U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-106, August 2010.
- Somers, D.M. and Maughmer, M.D., Design and Experimental Results for the S415 Airfoil, U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-114, August 2010.
- Somers, D.M. and Maughmer, M.D., Design and Experimental Results for the S408 Airfoil, Airfoils, Incorporated, February 2010.
- Maughmer, M.D., "The Penn State Human-Powered Airplane Project," SSA Convention, Little Rock, AR, Jan. 20-30, 2010.
- Somers, D.M. and Maughmer, M.D., "A New Airfoil Concept," SSA Convention, Little Rock, AR, Jan, 28-30, 2010.
- Somers, D.M. and Maughmer, M.D., Design and Experimental Results for the S414 Airfoil, U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-112, August, 2010.
- Roedts, R.L. and Maughmer, M.D., "Rotorcraft Performance Enhancements Due to a Lower-Surface Effector," European Rotorcraft Forum, Hamburg, Germany, Sept. 22-25, 2009.
- Schmidt, K. J. and Maughmer, M. D., "Is Student Performance Declining? A Look at Twenty-Five Years of Data," AC 2009-394, ASEE Annual Conference, Austin TX, June 14-17, 2009.
- Somers, D.M. and Maughmer, M.D., Design and Experimental Results for the S407 Airfoil, U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-109, August 2010.
- Bae, E.S., Gandhi, F., and Maughmer, M.D., "Optimally Scheduled Deployments of Miniature Trailing-Edge Effectors for Rotorcraft Power Reduction," American Helicopter Society Annual Forum, Grapevine, TX, May 27-29, 2009.
- Somers, D.M. and Maughmer, M.D., Design and Experimental Results for the S411 Airfoil, U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-111, August 2010.
- Somers, D.M. and Maughmer, M.D., "Design and Experimental Results for the S406 Airfoil," U.S. Army Aviation Research, Development and Engineering Command, U.S. Army RDECOM TR 10-D-107, August 2010.

SELECTED CONFERENCE PAPERS, PRESENTATIONS, AND REPORTS (cont'd)

- Somers, D. M. and Maughmer M.D., "Experimental Results for the E 387 Airfoil at Low Reynolds Numbers in the Penn State Low-Speed, Low-Turbulence Wind Tunnel," AHS Specialist's Conference on Aeromechanics, San Francisco, CA, Jan. 23-25, 2008.

- Martin, P., Rhee, M., Maughmer, M., and Somers, D., "Airfoil Design and Testing for High-Lift Rotorcraft Applications," AHS Specialist's Conference on Aeromechanics, San Francisco, CA, Jan. 23-25, 2008.
- Maughmer, M.D. and Somers, D.M., "Low-Speed, Experimental Results for a Tiltrotor Airfoil," Airfoils, Incorporated, November 2007.
- Maughmer, M.D. and Somers, D.M., "Low-Speed, Experimental Results for Two, Heavy Lift Tiltrotor Airfoils," Airfoils, Incorporated, October 2007.
- Maughmer, M.D. and Schmidt, K.J., "Teaching Free-Hand Drawing in Aerospace Engineering," AC 2007-1054, ASEE Annual Conference, Honolulu, HI, June 25-27, 2007.
- Somers, D.M. and Maughmer, M.D., "Experimental Results for the E387 Airfoil at Low Reynolds Numbers in The Pennsylvania State University Low-Speed, Low-Turbulence Wind Tunnel," Airfoils, Incorporated, May 2007.
- Bramesfeld, G. and Maughmer, M.D., "The Effects on Formation-Flight Aerodynamics Due to Wake Rollup," AIAA Paper 2007-729, AIAA Aerospace Sciences Meeting, Reno, NV, Jan. 8-11, 2007.
- Thiel, M., Lesieutre, G., Maughmer, M., and Koopmann, G., "Actuation of an Active Gurney Flap for Rotorcraft Applications," AIAA Paper 2006-2181, AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Newport, RI, May 1-4, 2006.
- Carrier, W., Johnson, M., Tubbesing, F., Maughmer, M., and Ravindra, K., "A Panel Discussion on Aerospace Education-Industry-Academia Perspective," (Invited), AIAA Aerospace Sciences Meeting, Reno, NV, Jan. 9-12, 2006.
- Maughmer, M.D., "The Design of Winglets for Low-Speed Aircraft," (Invited), Sport Aviation Symposium, An International Meeting on Light and Ultra Light Aircraft Design, Politecnico di Milano, Milano, Italy, October 24-26, 2005.
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