



## Marco Debiasi

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### EDUCATION

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UNIVERSITY OF CALIFORNIA, Irvine, California

*Ph.D. in Mechanical & Aerospace Engineering, 6/2000, GPA: 3.96 (4.00 scale)*

- Recipient of 'UCI Regents' Dissertation Fellowship' (Winter 2000).
- Dissertation: Acoustics of Dual-Stream High-Speed Jets.

This work presents the results of noise measurements in high-speed, round jets whose Mach number and velocity simulate the conditions of jet engines at take-off. The Mach number of the jet potential core ranged from 1.27 to 1.77 and the velocity ranged from 550 m/s to 1010 m/s. Most of the jets were silenced with a coflow that prevented the formation of Mach waves, a dominant contribution to supersonic jet noise. This method, called Mach Wave Elimination, relies on the shielding effect of the coflow which makes the motion of the eddies subsonic with respect to the surrounding streams, thus impeding the creation of Mach waves. Equal-thrust comparison of different experimental results shows that elimination of Mach waves is very effective in reducing noise in the direction of strongest emission. Except for localized shock-associated components, noise emission was found to be insensitive to nozzle exit pressure and to depend principally on the values of fully-expanded Mach number and velocity in the jet potential core. Jets with shorter Mach wave emitting region exhibited better noise suppression. Best results were obtained with an eccentric coflow that allows the shear layer of the upper part of the jet to grow naturally while silencing the jet in the downward direction. Coflows are capable of reducing the near-field screech peaks by up to 10 dB in imperfectly-expanded jets. Scaling the experimental results to a full-size engine shows that eccentric coflows reduce the noise perceived in the direction of peak emission by up to 11 dB. Preliminary analysis of the application of this silencing technique to engine design indicates that Mach wave elimination is feasible. Engines for supersonic business aircraft can apply this method and can be designed using the core of existing military turbofans.

- Graduate curriculum: mathematics (2 courses), fluid dynamics (3), computational fluid dynamics (1), turbulence (1), heat transfer (2), combustion (1), control (1), dynamics (1), instrumentation and data acquisition (1), manufacturing processes (1).

*M.S. in Mechanical Engineering, 6/1998*

- Masters Thesis: Noise Measurements in Supersonic Jets Treated with the Mach Wave Elimination Method.

UNIVERSITY OF PADUA, Padua, Italy

*B.S. in Mechanical Engineering, 6/1995, GPA: 110 cum Laude (110 scale)*

- Thesis: Metodi Pluriparametrici di Costruzione e Conteggio di Storie di Carico (Multi-parametric Methods for the Construction and Counting of Load Histories).
- Scholarships include: UC Education Abroad Program Scholarship (1991-1992), ATA (Automobile Technical Association, Italy) Scholarship (1995).

## PROFESSIONAL EXPERIENCE

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TEMASEK LABORATORIES (TL), NATIONAL UNIVERSITY OF SINGAPORE, Singapore  
*Senior Research Scientist, Experimental AeroScience Group (EAG) Head, from 4/2007*  
*Research Scientist, Aerodynamics Group, from 10/2006 to 4/2007*

- Direct the activities of the EAG.
    - Head 4 research scientists and 2 laboratory technicians.
    - Call and lead group meetings.
    - Appraise the performance of the group's members.
    - Define the research roadmap of the group and write the proposals for funding the research.
    - Supervise the design and execution of experiments.
    - Prepare reports and presentations for sponsors' reviews.
    - Organize the equipping of the EAG laboratory in the new NUS T-Lab. building.
  - Conduct research in:
    - the improvement of grid-fins for aircraft control;
    - the mixing and acoustics of high-speed jets from non-conventional nozzles;
    - the separation of flow and its active control in S-shaped inlets.
- In the above research I actively:
- plan the studies in cooperation with the CFD team of the TL (where pertinent);
  - design the experimental setups and contribute to their construction;
  - perform/direct the experimental measurements, analyze the data, and discuss the results;
  - write articles and papers for internationally recognized journals and conferences.
- Chairman of the TL Safety Committee.

THE OHIO STATE UNIVERSITY, Columbus, Ohio

*Post Graduate Researcher, Gas Dynamics and Turbulence Laboratory, from 8/2001 to 10/2006*

- Directed the experimental activities of an interdisciplinary group exploring closed-loop flow control within the Collaborative Center of Control Science (CCCS) at The Ohio State University.
  - Wrote part of the AFOSR/AFRL proposal that funded the CCCS projects in 2006.
  - Co-authored a winning SBIR research proposal on supersonic cavity-flow control
  - Co-authored a winning DURIP research proposal for use of closed-loop flow control to improve airfoils lift.
  - Directed and supervised the design and execution of experiments.
  - Assisted the development of real-time, output and state-feedback controllers.
  - Wrote articles and papers on flow control for internationally recognized journals and conferences.
- Studied the flow and acoustics of self-excited resonant flows.
  - Designed and constructed a subsonic cavity-flow wind tunnel.
  - Developed codes in Simulink, dSPACE, Labview, and Matlab for flow control and data acquisition and analysis.
  - Established an extensive cavity-flow database for a variety of speeds and geometries with and without actuation.
  - Investigated the effect of acoustic modes in confined cavity flows.
  - Designed and tested a synthetic-jet actuator for shear-layer flow control and quantified its dynamics.
  - Contributed to the development of a dynamic compensator for the actuator above.
  - Studied the dynamics, aeroacoustics, and control of impinging high-speed jets.
- Design Engineer and Project Manager of the Feedback Controlled Air-Supply System for GDTL (\$750,000 project).
  - Conceptualized the system and defined its performance requirements and overall architecture.
  - Supervised the design, manufacturing, assembly, installation, and testing of the system by Aero Systems Engineering, Speer Mechanical, and A.E. Ehrke.
- Lent technical support to the research in GDTL.
  - Responsible for the safety of the GDTL laboratory.
  - Assisted to incorporate advanced diagnostics and control systems in various GDTL experimental facilities.
  - Helped to set-up flow imaging techniques (Mie and Rayleigh scattering, PIV, schlieren, fast-speed movies, still images both phase-locked and not) for studying flow physics.

- Developed algorithms for locating acoustic sources from a jet in 3-D space.
- Mentored various graduate and undergraduate students working at GDTL.
- Received very positive comments and compliments from the supervisor, colleagues, and OSU faculties.

UNIVERSITY OF CALIFORNIA, Irvine, California

*Post Graduate Researcher, UCEI Research – Mixing Enhancement using Axial Flow, 7/2000 to 7/2001*

- Investigated the mixing enhancement of liquids and gases by the flow instability in a coaxial gaseous flow.
  - Designed and incorporated a liquid injection system in the UCI high-speed jet facility.
  - Fabricated injection components and set up the experimental apparatus.
  - Obtained schlieren and stroboscopic images of the mixing of liquid and gas streams.
  - Wrote a Fortran code to obtain the particle size distribution of a spray from laser diffraction measurements.
  - Conducted a preliminary assessment of the characteristics of the liquid breakup and of the parameters required to control the mixing mechanism by the coaxial flow.

UNIVERSITY OF CALIFORNIA, Irvine, California

*Research Assistant, NASA Research – Mach Wave Elimination in Supersonic Jets, 10/1996 to 3/2000*

- Investigated the physics and aeroacoustics of high-speed jets and studied novel concepts for controlling jet engine noise.
  - Operated a high-speed jet facility for small-scale reproduction of hot dual-stream subsonic and supersonic jets.
  - Designed and constructed an anechoic chamber and a microphone supports for polar measurements of jet noise.
  - Used different digital and analog signal acquisition systems.
  - Recorded and analyzed data from schlieren images, pressure transducers, and microphones.
  - Established an extensive database of the acoustics of dual-stream jets in a wide range of operating conditions.
  - Contributed to the development of a passive control technique for suppressing jet noise.
  - Developed conceptual designs for quiet supersonic jet engines, analyzed their performance, and extrapolated their full-scale acoustic effect.
  - Developed Fortran and Matlab codes for analysis of jets aeroacoustics and of gas-turbine engine cycles.
  - Presented the results in internationally recognized journals and conferences.
  - Received excellent reviews from the advisor and other UCI faculties.
- Additional research and laboratory activities.
  - Helped fellow students in preparing and executing experiments to study the evolution of large eddies in shear layers and to study variable density mixing layers under transverse and streamwise pressure gradients.

UNIVERSITY OF PADUA, Padua, Italy

*Researcher, FIAT Auto Research – Advances in Life Prediction of Structures, 6/1995 to 6/1996*

- Developed and tested innovative concepts for characterizing and testing the structural integrity of automotive components.
  - Introduced a novel, DNA-sequence based coding method for real-time construction of random load histories consisting of cycles of specified amplitude, frequency, and mean value.
  - Implemented a digital modulator-demodulator for constructing and counting load histories.
  - Studied the surface stress close to the weld bead of plates in cross joints by using finite elements methods.
  - Studied the propagation of cracks in notched components and refined predictive models for crack failure.

AERONAUTICA MILITARE ITALIANA (ITALIAN AIR FORCE), Florence and Padua, Italy

*Second Lieutenant, Arma Aeronautica – Ruolo Servizi, 1/1994 to 4/1995*

- Logistic support of several SAM-based air defense groups within the 1<sup>st</sup> Aero-Brigade.
  - Directed a section providing spare parts and supplies to combat-ready units.
  - Superintended ground services.
  - Responsible for organizing and ensuring airport security (2 days/month).

## TEACHING EXPERIENCE

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NATIONAL UNIVERSITY OF SINGAPORE, Singapore

*Teaching Associate – Department of Mechanical Engineering, from 1/2008*

- Lecture classes (size 40-50), prepare and give exams in ME4231 “Aerodynamics & Propulsion”.
- Consistently receive positive teaching evaluations.

THE OHIO STATE UNIVERSITY, Columbus, Ohio

*Post Graduate Researcher, from 8/2001 to 10/2006*

- Given class lectures in gas dynamics and flow control.

UNIVERSITY OF CALIFORNIA, Irvine, California

*Teaching Assistant, Courses: Compressible Flow, Aircraft Performance, Thermodynamics, 10/1997 to 6/1999*

- Class sizes of 12 to 60.
- Consistently received excellent class evaluations.

## PUBLICATIONS AND PROCEEDINGS

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### BOOKS

Samimy, M., Debiasi, M., Caraballo, E., Serrani, A., Yuan, X., Little, J., and Myatt, J. H., “Reduced-order Model-based Feedback Control of Subsonic Cavity Flows”, in **Active Flow Control**, papers contributed to the Conference “Active Flow Control 2006”, Berlin, Germany, September 27-29, 2006. Series: [Notes on Numerical Fluid Mechanics and Multidisciplinary Design \(NNFM\)](#), Vol. 95, XIII, editor Rudibert King, Springer, 2007. (ISBN: 978-3-540-71438-5)

### JOURNAL PUBLICATIONS

1. Yuan, X., Caraballo, E., Little, J., Debiasi, M., Serrani, A., Özbay, H., Myatt, J.H., and Samimy, M., “Feedback Control Design for Subsonic Cavity Flows”, **Applied and Computational Mathematics**, Vol. 8, No. 1, pp. 70-91, June 2009.
2. Malone, J., Debiasi, M., Little, J., and Samimy, M., “Analysis of the spectral relationships of cavity tones in subsonic resonant cavity flows”, **Physics of Fluids**, Vol. 21, 055103, May 2009.
3. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., “Seven tuning schemes for an ADALINE model to predict floor pressures in a subsonic cavity flow”, **Transactions of the Institute of Measurement and Control**, Vol. 31, No. 1, pp. 97-112, February 2009.
4. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., “Neural network-based modelling of subsonic cavity flows”, **International Journal of Systems Science**, Vol.39, No.2, pp.105-117, February 2008.
5. Kim, K., Debiasi, M., Schultz, R., Serrani, A., and Samimy, M., “Dynamic Compensation of a Synthetic Jetlike Actuator for Closed-Loop Cavity Flow Control”, **AIAA Journal**, Vol. 46, No. 51, pp. 232-240, January 2008.
6. Caraballo, E., Little, J., Debiasi, M., and Samimy, M., “Development and Implementation of an Experimental-Based Reduced-Order Model for Feedback Control of Subsonic Cavity Flows”, **Journal of Fluids Engineering**, Vol. 129, pp. 813-824, July 2007.
7. Little, J., Debiasi, M., Caraballo, E., and Samimy, M., “Effects of open-loop and closed-loop control on subsonic cavity flows”, **Physics of Fluids**, Vol. 19, 065104, June 2007.
8. Samimy, M., Debiasi, M., Caraballo, E., Serrani, A., Yuan, X., Little, J., and Myatt, J. H., “Feedback control of subsonic cavity flows using reduced-order models”, **Journal of Fluid Mechanics**, Vol. 579, pp. 315-346, May 2007.
9. Yan, P., Debiasi, M., Yuan, X., Little, J., Özbay, H., and Samimy, M., “Experimental Study of Linear Closed-Loop Control of Subsonic Cavity Flow”, **AIAA Journal**, Vol. 44, No. 5, pp. 929-938, May 2006.
10. Debiasi, M., and Samimy, M., “Logic-Based Active Control of Subsonic Cavity-Flow Resonance”, **AIAA Journal**, Vol. 42, No. 9, pp. 1901-1909, September 2004.
11. Papamoschou D., and Debiasi, M. "Conceptual Development of Quiet Turbofan Engines for Supersonic Aircraft”, **AIAA Journal of Propulsion and Power**, Vol. 19, No.2, 2003, pp. 161-169, March-April 2003.

12. Debiasi, M., and Papamoschou, D., "Noise from Imperfectly Expanded Supersonic Coaxial Jets", *AIAA Journal*, Vol. 39, No. 3, pp. 388-395, March 2001.
13. Papamoschou, D., and Debiasi, M., "Directional Suppression of Noise from a High-Speed Jet", *AIAA Journal*, Vol. 39, No. 3, pp. 380-387, March 2001.
14. Papamoschou, D., and Debiasi, M., "Noise Measurements in Supersonic Jets Treated with the Mach Wave Elimination Method", *AIAA Journal*, Vol. 37, No. 2, pp. 154-160, February 1999.

#### CONFERENCE PAPERS

1. Debiasi, M., Zeng, Y., and Chng, T.L., "Swept-back Grid Fins for Transonic Drag Reduction", AIAA Paper 2010-4244, 28<sup>th</sup> AIAA Applied Aerodynamics Conference, Chicago, IL, June-July 2010.
2. Zeng, Y., Cai, J., Debiasi, M., and Chng, T.L., "Numerical Study on Drag Reduction for Grid-Fin Configurations", AIAA Paper 2009-1105, 47<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, January 2009.
3. Debiasi, M., Herberg, M. R., Tsai, H. M., and Papamoschou, D., "Mixing Characteristics of Elliptical Jets with Plug", AIAA Paper 2008-0787, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2008.
4. Debiasi, M., Herberg, M. R., Yan, Z., Dhanabalan, S. S., and Tsai, H. M., "Control of Flow Separation in S-ducts via Flow Injection and Suction", AIAA Paper 2008-0074, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2008.
5. Debiasi, M., Dhanabalan, S. S., Tsai, H. M., and Papamoschou, D., "Mixing Enhancement of High-Bypass Turbofan Exhausts via Contouring of Fan Nozzle", AIAA Paper 2007-4497, 37<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Miami, FL, June 2007.
6. Debiasi, M. and Tsai H. M., "Effects of Tangential Blowing on High-Speed Jets", AIAA Paper 2007-3861, 37<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Miami, FL, June 2007.
7. Caraballo, E., Little, J., Debiasi, M., Serrani, A., and Samimy, M., "Reduced Order Model for Feedback Control of Cavity Flow - The Effects of Control Input Separation", AIAA Paper 2007-1125, 45<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2007.
8. Kim, K., Debiasi, M., Schultz, R., Serrani, A., and Samimy, M., "Dynamic Compensator for a Synthetic-Jet-Like Compression Driver Actuator in Closed-Loop Cavity Flow Control", AIAA Paper 2007-0880, 45<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2007.
9. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., "Support Vector Networks for Prediction of Floor Pressures in Shallow Cavity Flows", in 2006 CCA/CACSD/ISIC, Munich, Germany, October 2006.
10. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., "Iterative and Batch Mode Algorithms for Modeling of Aerodynamic Cavity Flows Under Boundary Excitations", in International Conference on Nonlinear Problems in Aviation and Aerospace (ICNPAA'06), Budapest, Hungary, June 2006.
11. Debiasi, M., Little, J., Caraballo, E., Yuan, X., Serrani, A., Myatt, J. H., and Samimy, M., "Influence of Stochastic Estimation on the Control of Subsonic Cavity Flow – A Preliminary Study", AIAA Paper 2006-3492, 3<sup>rd</sup> AIAA Flow Control Conference, San Francisco, CA, June 2006.
12. Caraballo, E., Yuan, X., Little, J., Debiasi, M., Serrani, A., Myatt, J. H., and Samimy, M., "Further Development of Feedback Control of Cavity Flow Using Experimental Based Reduced Order Model", AIAA Paper 2006-1405, 44<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2006.
13. Little, J., Debiasi, M., and Samimy, M., "Flow Structure in Controlled and Baseline Subsonic Cavity Flows", AIAA Paper 2006-0480, 44<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2006.
14. Yan, P., Debiasi, M., Yuan, X., Caraballo, E., Serrani, A., Özbay, H., Myatt, J. H., Samimy, M., "Modeling and Feedback Control for Subsonic Cavity Flows: A Collaborative Approach", Paper WeIB18.6, 2005 Joint CDC-ECC Conference, Seville, Spain, December 2005.
15. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., "A Generalizing Fuzzy Model for Shallow Cavity Flow Under Different Mach Regimes", Proc. of the 2005 IEEE Conference on Control Applications, Toronto, Canada, August 28-31, 2005, pp.67-72.
16. Caraballo, E., Yuan, X., Yan, P., Debiasi, M., Serrani, A., Samimy, M., and Myatt J. H., "Feedback Control of Cavity Flow Using Experimental Based Reduced Order Model", AIAA Paper 2005-5269, 35<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Toronto, ON, June 2005.
17. Efe, M. Ö., Debiasi, M., Yan, P., Özbay, H., and Samimy, M., "Control of Subsonic Cavity Flows by Neural Networks – Analytical Models and Experimental Validation", AIAA Paper 2005-0294, 43<sup>rd</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2005.

18. Debiasi, M., Little, J., Malone, J., Samimy, M., Yan, P., and Özbay, H., “An Experimental Study of Subsonic Cavity Flow – Physical Understanding and Control”, AIAA Paper 2004-2123, 2<sup>nd</sup> AIAA Flow Control Conference, Portland, OR, June 2004.
19. Efe, M. Ö., Debiasi, M., Özbay, H., and Samimy, M., “Modeling of Subsonic Cavity Flows by Neural Networks”, Proc. of the IEEE International Conference on Mechatronics (ICM'04), Istanbul, Turkey, June 3-5, 2004, pp.560-565.
20. Samimy, M., Debiasi, M., Caraballo, E., Malone, J., Little, J., Özbay, H., Efe, M. Ö., Yan, P., Yuan, X., DeBonis, J., Myatt, J. H., and Camphouse, R. C., “Exploring Strategies for Closed-Loop Cavity Flow Control”, AIAA Paper 2004-0576, 42<sup>nd</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2004.
21. Yan, P., Debiasi, M., Yuan, X., Caraballo, E., Efe, M. Ö., Özbay, H., Samimy, M., DeBonis, J., Camphouse, C., Myatt, J. H., Serrani, A., and Malone, J., “Controller Design for Active Closed-Loop Control of Cavity Flows”, AIAA Paper 2004-0573, 42<sup>nd</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2004.
22. Samimy, M., Debiasi, M., Caraballo, E., Özbay, H., Efe, M. Ö., Yuan, X., DeBonis, J., Myatt, J. H., “Development of Closed-loop Control for Cavity Flows”, AIAA Paper 2003-4258, 33<sup>rd</sup> AIAA Fluid Dynamics Conference and Exhibit, Orlando, FL, June 2003.
23. Debiasi, M., Samimy, M., “An Experimental Study of the Cavity Flow for Closed-Loop Flow Control”, AIAA Paper 2003-4003, 33<sup>rd</sup> AIAA Fluid Dynamics Conference and Exhibit, Orlando, FL, June 2003.
24. Samimy, M., Debiasi, M., Caraballo, E., Özbay, H., Efe, M. Ö., Yuan, X., DeBonis, J., and Myatt, J. H., “Closed-Loop Active Flow Control – A Collaborative Approach”, AIAA Paper 2003-0058, 41<sup>st</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2003.
25. Samimy, M., Kastner, J., and Debiasi, M., “Control of an Impinging High Speed Jet Using Hartmann Tube Based Fluidic Actuators”, AIAA paper 2002-2822, 1<sup>st</sup> AIAA Flow Control Conference, St. Louis, MO, June 2002.
26. Papamoschou, D., and Debiasi, M., “Mach Wave Elimination Applied to Turbofan Engines”, AIAA paper No. 2002-0368, 40<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2002.
27. Debiasi, M., and Papamoschou, D., “Cycle Analysis for Quieter Supersonic Turbofan Engines”, AIAA paper 2001-3749, 37<sup>th</sup> AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Salt Lake, July 2001.
28. Papamoschou, D., and Debiasi, M., “Targeted Mach Wave Elimination”, AIAA paper 2000-0085, 38<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2000.
29. Debiasi, M., and Papamoschou, D., “Application of the Mach Wave Elimination Method to Supersonic Jet Engines”, Proceedings of the XIV International Symposium on Air Breathing Engines, Florence, Italy, September 1999.
30. Debiasi, M., and Papamoschou, D., “Acoustics of Under- and Over-Expanded Coaxial Jets”, AIAA paper 99-0081, 37<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 1999.
31. Papamoschou, D., and Debiasi, M., “Noise Measurements in Supersonic Jets Treated with the Mach Wave Elimination Method”, AIAA paper 98-0280, 36<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 1998.

#### THESES AND DISSERTATIONS

1. Ph.D. Dissertation: Acoustics of Dual-Stream High-Speed Jets, University of California, Irvine, June 2000.
2. M.S. Thesis: Noise Measurements in Supersonic Jets Treated with the Mach Wave Elimination Method, University of California, Irvine, June 1998.
3. University Degree Thesis: Metodi Pluriparametrici di Costruzione e Conteggio di Storie di Carico (Multi-parametric Methods for the Construction and Counting of Load Histories), University of Padua, Italy, June 1995.

#### ORAL PRESENTATIONS

1. Debiasi, M., Zeng, Y., and Chng, T.L., “Swept-back Grid Fins for Transonic Drag Reduction”, AIAA Paper 2010-4244, 28<sup>th</sup> AIAA Applied Aerodynamics Conference, Chicago, IL, June-July 2010
2. Debiasi, M., Herberg, M. R., Tsai, H. M., and Papamoschou, D., “Mixing Characteristics of Elliptical Jets with Plug”, AIAA Paper 2008-0787, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2008.
3. Debiasi, M., Herberg, M. R., Yan, Z., Dhanabalan, S. S., and Tsai, H. M., “Control of Flow Separation in S-ducts via Flow Injection and Suction”, AIAA Paper 2008-0074, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2008.

4. Debiasi, M., Dhanabalan, S. S., Tsai, H. M., and Papamoschou, D., "Mixing Enhancement of High-Bypass Turbofan Exhausts via Contouring of Fan Nozzle", AIAA Paper 2007-4497, 37<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Miami, FL, June 2007.
5. Debiasi, M. and Tsai H. M., "Effects of Tangential Blowing on High-Speed Jets", AIAA Paper 2007-3861, 37<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Miami, FL, June 2007.
6. Debiasi, M., Little, J., Caraballo, E., Yuan, X., Serrani, A., Myatt, J.H., and Samimy, M., "Influence of Stochastic Estimation on the Control of Subsonic Cavity Flow – A Preliminary Study," AIAA Paper 2006-3492, 3<sup>rd</sup> AIAA Flow Control Conference, San Francisco, CA June 2006.
7. Debiasi, M., Little, J., and Samimy, M., "Flow Structure in Baseline and Controlled Subsonic Cavity Flows," 58th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Chicago, IL, November 2005.
8. Caraballo, E., Yuan, X., Yan, P., Debiasi, M., Serrani, A., Samimy, M., and Myatt J. H., "Feedback Control of Cavity Flow Using Experimental Based Reduced Order Model," AIAA Paper 2005-5269, 35<sup>th</sup> AIAA Fluid Dynamics Conference and Exhibit, Toronto, ON, June 2005.
9. Debiasi, M., Little, J., Malone, J., Samimy, M., Yan, P., and Özbay, H., "An Experimental Study of Subsonic Cavity Flow – Physical Understanding and Control," AIAA Paper 2004-2123, 2<sup>nd</sup> AIAA Flow Control Conference, Portland, OR, June 2004.
10. Debiasi, M., Samimy, M., "An Experimental Study of the Cavity Flow for Closed-Loop Flow Control," AIAA Paper 2003-4003, 33<sup>rd</sup> AIAA Fluid Dynamics Conference and Exhibit, Orlando, FL, June 2003.
11. Debiasi, M., and Papamoschou, D., "Cycle Analysis for Quieter Supersonic Turbofan Engines", AIAA paper No. 2001-3749, 37<sup>th</sup> AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Salt Lake, July 2001.
12. Debiasi, M., and Papamoschou, D., "Application of the Mach Wave Elimination Method to Supersonic Jet Engines", Proceedings of the XIV International Symposium on Air Breathing Engines, Florence, Italy, September 1999.
13. Debiasi, M., and Papamoschou, D., "Acoustics of Under- and Over-Expanded Coaxial Jets", AIAA paper No. 99-0081, 37<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 1999.

## PROFESSIONAL AFFILIATIONS

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- American Institute of Aeronautics and Astronautics (AIAA)
  - Reviewer for AIAA Journal (from 1/2006).
  - Chair (from 6/2004), Vice-Chair (from 4/2003), and Secretary (10/2001 to 4/2003) of the AIAA Columbus Section.
  - Editor of the monthly newsletter "AIAA Columbus Section News" (from 1/2002 to 6/2004).
- American Society of Mechanical Engineers (ASME) (to 12/2006)
- American Physical Society (APS) (11/2005 to 12/2006)

## TECHNICAL EXPERTISE

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- Theoretical and experimental low and high-speed fluid dynamics, flow measurements, actuation and control, aeroacoustics, flow noise reduction, turbulence, liquid and gas injection and mixing.
- Experimental techniques: pressure and acoustic measurements, Mie and Rayleigh scattering, shadowgraph and schlieren imaging, particle image velocimetry, flow-velocity measurements, thermal measurements, design, calibration, and testing of instrumentation, control with hardware-in-the-loop.
- Equipment: microphones, loudspeakers, dynamic and static pressure transducers, Nd:YAG lasers, optical systems, CCD, CMOS and film cameras, hot-wires, thermocouples, jet atomizers, National Instruments ADC and DAC converters and acquisition systems, dSPACE DSPs and control systems.
- Some experience in the implementing different feedforward, feedback, and adaptive control techniques including linear control, H-infinity, Neural-Network, Fuzzy Logic.
- Preliminary design and performance analysis of gas turbine engines.
- Design, construction, and operation of low and high-speed flow facilities (free jets and wind tunnels) and anechoic facilities.
- Direction of experimental activities and laboratory personnel.
- Computer: MS Office, MS Windows, LaTeX, HTML, Matlab, Simulink, dSPACE, Labview, Solidworks; limited Fortran, Autocad, and Ansys.

## **ADDITIONAL SKILLS**

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- Bilingual: fluent in English and Italian.
- Organization of social and cultural events: AIAA Columbus Section Distinguished Lectures (5/2002, 3/2003, 2/2004, 4/2004, 3/2005) and Dinner and Lecture Meetings (11/2003, 10/2004, 11/2004).
- Photography.
- Website development.

## **OTHERS**

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- Recipient of the AIAA 2002-2003 Communication Award in the Very Small Section Category.