

Miguel Palaviccini

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OBJECTIVE

I am looking for a doctoral level career allowing my knowledge and experience to be applied to solve problems in the flow control and/or fluid dynamics fields and help shape the new generation of aircrafts through creative and robust solutions and designs.

EDUCATION

Ph.D., Aerospace Engineering | University of Florida, Gainesville FL

Dissertation: *Control of Three-Dimensional Flow over a Turret*

Advisor: Louis N. Cattafesta III

Expected Graduation: December 2012; GPA: 3.8/4.0

M.S., Mechanical Engineering | University of Florida, Gainesville FL

Graduated December 2008; GPA: 3.8/4.0

B.S., Aerospace Engineering | University of Florida, Gainesville FL

Graduated December 2006 *Summa Cum Laude*; GPA: 3.9/4.0, Dean's List 2003-2006

EXPERIENCE

Graduate Research Assistant | University of Florida, Gainesville FL

Interdisciplinary Microsystems Group

January 2007 – Present

- Investigated the fluid dynamics of a submerged, three-dimensional turret at low subsonic speeds using a variety of measurement tools – including hot-wire anemometry, particle image velocimetry, and oil flow visualization. Currently developing passive and active flow control strategies for reducing aero-optic degradation in the wake region of a three-dimensional turret at low subsonic speeds.
- Performed adaptive, closed-loop control algorithm experiments to suppress Rossiter modes resulting from flow-induced cavity oscillations.
- Implemented closed-loop disturbance rejection algorithms using time-domain analysis techniques and system identification methods to delay separation at high angles of attack on a NACA0025 airfoil.
- Provided expertise and technical oversight to undergraduate students on flow control projects.
- Mentored applicants of *NSF Graduate Research Fellowship*; Overseeing three winners and two honorable mention recipients.

Research Consultant | Interdisciplinary Consulting Corporation, Gainesville FL

Interdisciplinary Consulting Corporation

- Developed a MATLAB and LabVIEW-based downhill simplex optimization sub-function for The Boeing Company; **April 2010**
- Characterized velocity output of an electrodynamic based actuator using hot-wire anemometry and compared results to an analytical model for The Boeing Company; **March 2006**

Teaching Assistant | University of Florida, Gainesville FL

Active Flow Control

August 2010 – December 2010

- Worked alongside Dr. Cattafesta to create comprehensive course notes and answer graduate student inquiries

Fluid Mechanics

August 2009 – December 2009

- Instructed 30+ undergraduate students in semi-weekly recitation sections
- Prepared lesson plans, quizzes and graded course material

Aerodynamics

January 2008 – May 2008

- Developed elaborate course material to supplement in-class notes
- Planned and taught weekly, two-hour recitation courses

Visiting Researcher | University of Southampton, UK

Advanced Fluid Mechanic Research Group

May 2007 – August 2007

- Utilized surface oil flow visualization and particle image velocimetry to examine flow around passive vortex generators for implementation in Formula 1 vehicles

Undergraduate Research Assistant | University of Florida, Gainesville FL

Interdisciplinary Microsystems Group

May 2005 – December 2006

- Aided in experimental setup of a study characterizing an electrodynamic actuator, integral to Dr. Ryan Holman's Ph.D. dissertation: *An Experimental Investigation of Flows from Zero-Net Mass-Flux Actuators*
- Supported graduate researchers by modeling and creating technical drawings of parts for fabrication and use in a subsonic blow-down tunnel
- Conducted experiments in a closed-return tunnel and calculate needed chilled water capacity to maintain a constant temperature throughout experimental runs

- AIAA Design Build Fly International Competition** | University of Florida, Gainesville FL
Lead Engineer **September 2006 – April 2007**
- o Managed a 40+ team of students in designing, fabricating, and demonstrating flight capabilities of an unmanned, electric powered, radio-controlled aircraft to best meet three separate mission profiles
 - o Guided team to University's first top-10 finish
- Avionics and Propulsions Lead Engineer* **September 2005 – April 2006**
- o Designed and optimized the avionics and propulsion system used in a high lift, large weight-capacity UAV and served as test pilot for all aircraft flight-testing
- Aerodynamic Team Member* **September 2003 – April 2004**
- o Worked in a team to develop, integrate, and evaluate different airfoils using XFOIL to optimize the L/D ratio for a high-lift UAV
- Tutor** | University of Florida, Gainesville FL
Academic Technology Teaching Center **January 2004 – May 2005**
- o Provided private instruction to students in calculus and physics and prepared two-hour review sessions prior to four major exams per semester

TRAINING

- University of Florida** | Gainesville FL **January 2006 – Present**
- o **Fluid Mechanics:** Inviscid, Viscous, Turbulence, Compressible Flow
 - o **Controls:** Flow Control, Control System Theory, Non-Linear Control, State Variable Methods
 - o **Experimental:** Data Measurement and Analysis, Optimal Estimation, Digital Signal Processing
- University of Poitiers** | Poitiers France **December 2009**
- o Professional Development Short Course on Flow Control Methods and Applications
- dSPACE Learning Center** | Wixom MI **June 2009**
- o Real-Time System Hands-on Training Workshop
- University of Florida Research and Engineering Education Facility** | Shalimar FL **April 2009**
- o LaVision Stereo Particle Image Velocimetry Training

SOFTWARE

AutoCAD | Dantec Streamware | DaVis | MATLAB | LabView | Photoshop CS5 | Simulink | Solidworks

AWARDS

National Science Foundation: Honorable Mention, 2007
University of Florida Alumni Graduate Fellowship Recipient, 2007 – 2011
Elected to Tau Beta Pi Engineering Honor Society, 2005

JOURNAL PUBLICATIONS

Takahashi, H., Liu, F., **Palaviccini, M.**, Oyarzun, M., Griffin, J., Ukeily, L., and Cattafesta, L. "Experimental Study of Adaptive Control on High-Speed Flow-Induced Cavity Resonance," *Journal of Fluid Science and Technology*, vol. 6, no. 5, pp. 701-716, July 2011.

Yang, S., Liu, F., Oyarzun, M., **Palaviccini, M.**, and Cattafesta, L., "Transfer Matrix Modeling of Synthetic Jet Actuators," *Journal of Fluid Science and Technology*, in progress.

CONFERENCE PUBLICATIONS

Takahashi, H., Liu, F., **Palaviccini, M.**, Oyarzun, M., Griffin, J., Ukeily, L., and Cattafesta, L. "Progress on Active Control of Open Cavities," *49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*, AIAA 2011-1221, Orlando, FL, AIAA, January 2011.

Palaviccini, M., George, B., and Cattafesta, L. "Passive Flow Control over a Three-Dimensional Turret with a Flat Aperture," *41st AIAA Fluid Dynamics Conference and Exhibit*, AIAA Paper 2011-3265, Honolulu, Hawaii, AIAA, June 2011.

Takahashi, H., Liu, F., **Palaviccini, M.**, Oyarzun, M., Ukeily, L., and Cattafesta, L., "Experimental Study of Adaptive Control on High-Speed Flow-Induced Cavity Resonance," *Seventh International Conference on Flow Dynamics*, Sendai, Japan, Tohoku University Global COE Program, November 2010.

Arunajatesan S., Oyarzun, M., **Palaviccini, M.**, and Cattafesta, L., "Modeling of Zero-Net-Mass-Flux Devices for Feedback Flow Control," *47th AIAA Aerospace Sciences Meeting*, *AIAA Paper 2009-0743*, January 2009.

Arunajatesan S., Song, Q., **Palaviccini, M.**, and Cattafesta, L., "Towards Adaptive Closed-Loop Control of Transonic Cavity Flows," *4th Flow Control Conference*, AIAA 2008-3861: AIAA, June 2008.

ACTIVITIES

Private Pilot: License (Part 61) obtained with 40.2 hours of training. Over 50 flight hours in Cessna 172SP, Cessna 152, and Piper Warrior PA-28

Remote Control Airplane Pilot: *Academy of Model Aeronautics* member since 1999

University of Florida Ultimate Frisbee Club Team Member: 2010 USA Ultimate National Champion and 2011 first team all-region

University of Florida Intramural Champion: Twelve times total in Softball, Ultimate Frisbee, Flag Football, Dodgeball and Cornhole

Nature and Wildlife Photographer: www.miguelpalaviccini.com