Gonzalo A. Garcia, PhD AE, MSc EE, BSc EE

Florida Atlantic University, Ocean and Mechanical Engineering, www.fau.edu
Post-doctoral fellow

garciag@fau.edu
garciagarreton@hotmail.com,

Professional Education

Doctor of Philosophy in Aerospace Engineering, 2013 (g*raduated with honors, GPA 3.95*).
Institution : University of Kansas KU, Lawrence, Kansas.
Research : Adaptive flight control design; Robust and predictive nonlinear flight control design.
Website : www.ae.engr.ku.edu

Master of Science in Electronic Engineering, 2006 (*thesis with highest score*).
Institution : Federico Santa Maria Technical University UTFSM, Valparaíso, Chile.
Research : Automatic control; System identification; Phenomenological modeling.
Website : www.elo.utfsm.cl

Bachelor of Science in Electronic Engineering, 1994 (*ranked second*).
Institution : Naval Polytechnic Academy, Viña del Mar, Chile.
Major : Radar interfacing design; Digital processing electronic hardware design.
Website : www.apolinav.cl

Postdoctoral Professional Preparation

Postdoctoral Associate, December 2015-February 2016.
Institution : University of Kansas, Lawrence, Kansas.
Organization : ITTC (The Information and Telecommunication Technology Center).
Research : Flight Control System with obstacle avoidance capability for fixed wing aircraft.
Website : www.ittc.ku.edu

Visiting Researcher, September 2015-December 2015.
Institution : Microsoft Corporation, Redmond, Washington.
Organization : MSR (Microsoft Research).
Research : Design and flight test a control system for nanoquadrotor, including predictive, and optimal guidance for trajectory following.
Website : www.microsoft.com/en-us/research

Postdoctoral Associate, November 2014-August 2015.
Institution : University of Kansas, Lawrence, Kansas.
Organization : CReSIS (Center for Remote Sensing of Ice Sheets).
Research : Adaptive flight control system design for multi agent, based on cooperative flight control; Online optimal trajectory generation.
Website : www.cresis.ku.edu

Postdoctoral Associate, February 2013-October 2014.
Institution : University of Kansas, Lawrence, Kansas.
Department : Aerospace Engineering Department.
Research : Advance flight control system design, based on robust and predictive nonlinear control.
Website : www.ae.engr.ku.edu

Books

Decentralized Robust Nonlinear Model Predictive Control for UAS, LAP Lambert Academic Publishing, Jun 2014.

Articles

Journals:

J11 Fabregas, E., Farias, G., Aranda-Escolastico, E., Garcia, G., Chaos, D., Dormido-Canto, S., and Dormido, S., "*Simulation and Experimental Results of a New Control Strategy for Point Stabilization of Nonholonomic Mobile Robots*", 2019, DOI: 10.1109/TIE.2019.2935976, IEEE Transactions on Industrial Electronics.

J10 Farias, G., Fabregas, E., Peralta, E., Vargas, H., Hermosilla, G., Garcia, G., Dormido, S., "*A Neural Network Approach for Building an Obstacle Detection Model by Fusion of Proximity Sensor Data*", Sensors 2018, 18(3), 683; doi:10.3390/s18030683, pp. 1-18.

J9 Kim, A. R., Keshmiri, S., Huang, W., and Garcia, G., "*Guidance of Multi-Agent Fixed-Wing Aircraft Using a Moving Mesh Method*", Unmanned Systems, Vol. 4, No. 3, 2016, pp. 277-244.

J8 Garcia, G., and Keshmiri, S., "*Biologically Inspired Trajectory Generation for Swarming UAVs Using Topological Distances* ", AESCTE Aerospace Science and Technology, ELSEVIER, 54 (2016), pp. 312-319.

J7 Garcia, G., Keshmiri, S., and Stastny, T., "*Nonlinear Model Predictive Controller Robustness Extension for Unmanned Aircraft*", International Journal of Intelligent Unmanned Systems, Vol. 3, 2/3, 2015, pp. 93-121.

J6 Garcia, G., Keshmiri, and S Stastny, T. J., "*Robust and Adaptive Nonlinear Model Predictive Controller for Unsteady and Highly Nonlinear Unmanned Aircraft*", IEEE Transactions on Control Systems Technology, Vol. 23, 4, 2014, pp. 1620-1627.

J5 Stastny, T. J., Garcia, G., and Keshmiri, S., "*Collision and Obstacle Avoidance in Unmanned Aerial Systems Using Morphing Potential Field Navigation and Nonlinear Model Predictive Control*", ASME Journal of Dynamics Systems, Measurements and Control, 137(1), 014503, 2014.

J4 Garcia, G. and Keshmiri, S., "*Online Artificial Neural Network Model-based Nonlinear Model Predictive Controller for the Meridian UAS*", *International Journal of Robust and Nonlinear Control*, Vol. 23, 2013, pp. 1657-1681**.**

J3 Garcia, G. and Keshmiri, S., "*Adaptive and Resilient Flight Control System for a Small Unmanned Aerial System*", *HINDAWI International Journal of Aerospace Engineering*, Vol. 2013, Article ID. 289357.

J2 Zamora, R., Ulloa, D., Garcia, G., Mella, R., Uribe, J., Wendt, J., Rivera, A., Gacitua, G., and Casassa, G., "*Airborne Radar Sounder for Temperate Ice: Initial Results from Patagonia*", *Journal of Glaciology*, Vol. 55, No., 191, 2009, pp. 507-512.

J1 Garcia, G., Uribe, A., Ulloa, D., Zamora, R., and Casassa, G., "Theoretical Analysis and Simulation for Avoiding Antenna Oscillations without Distributed Resistance", *Journal of Applied Geophysics*, Vol. 67, 2009, pp. 374-385.

Conference papers:

C31 Farias, G., Garcia, G., Montenegro, G., Fabregas, E., Dormido-Canto, S., and Dormido, S., "Position control of a mobile robot using reinforcement learning", **accepted to the** 21st IFAC World Congress, July 2020, Berlin, Germany.

C30 Garcia, G., Uddin, M., Verma, S., and Curet, O., "Reinforcement Learning for a Bio-Inspired Vehicle with Undulating Fin Propulsion", presented at 72nd Annual Meeting of the APS Division of Fluid Dynamics, November 2019, Seattle, WA.

C29 Espinoza, A., Garcia, G., and Curet, O., "Maneuver Control of an Undulating-Fin Underwater Vessel with a Central Pattern Generator", presented at 72nd Annual Meeting of the APS Division of Fluid Dynamics, November 2019, Seattle, WA.

C28 Uddin, M., Garcia, G., and Curet, O., “Yaw Turning Experiments of a Bio-Inspired Vessel with Undulating Fin Propulsion”, presented at 72nd Annual Meeting of the APS Division of Fluid Dynamics, November 2019, Seattle, WA.

C27 Galan, D., Fabregas, E., Garcia, G., Saenz J., Farias, G., Dormido canto S., Dormido, S., “Online Virtual Control Laboratory of Mobile Robots”, IFAC Papers On Line, 3rd IFAC Conference on Advances in Proportional-Integral-Derivative Control, PID’18, May 09-11, 2018, Ghent, Belgium.

C26 Garcia, G., Kim, A. R., Jackson, E., Keshmiri, S., and Shukla, D., “Modeling and Flight Control of a Commercial Nano Quadrotor”, IEEE, ICUAS 2017 International Conference on Unmanned Aircraft Systems, June 13-16, 2017, Miami, FL.

C25 Garcia, G., Keshmiri, S., and Shukla, D., “Nonlinear Control based on H-Infinity Theory for Autonomous Aerial Vehicle”, IEEE, ICUAS 2017 International Conference on Unmanned Aircraft Systems, June 13-16, 2017, Miami, FL.

C24 Vedantam, M., Keshmiri, S., Garcia, G., and Huang, W., “Fixed Wing Aircraft Perching”, AIAA 2017-1915 SciTech, Guidance, Navigation, and Control Conference, January 2017, Grapevine, Texas.

C23 Prasanth, V., Garcia, G., Yun, H., and Keshmiri, S., “A Simplex Architecture for Intelligent and Safe Unmanned Aerial Vehicles”. IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), Daegu, South Korea, August 2016.

C22 Kim, A. R., Keshmiri, S., Huang, W., and Garcia, G., “Guidance of Multi-Agent Fixed-Wing Aircraft Using Moving Mesh Methods”, IEEE, ICUAS 2015 International Conference on Unmanned Aircraft Systems, June 2015, Denver, CO, pp. 218-225.

C21 Garcia, G., Keshmiri, S., and Huang, W., “Recovery of an Aircraft from the Loss of Control Using Open Final Time Dynamic Optimization and Receding Horizon Control”, AIAA 2015-1545 SciTech, Guidance, Navigation, and Control conference, January 2015, Kissimmee, Florida.

C20 Garcia, G., and Keshmiri, S., “Nonlinear H-infinity Control applied to a UAS in Trajectory Following”, AIAA 2015-1319 SciTech, Guidance, Navigation, and Control conference, January 2015, Kissimmee, Florida.

C19 Stastny, T. J., Garcia, G., and Keshmiri, S., “Robust Three-Dimensional Collision Avoidance for Fixed-Wing Unmanned Aerial Systems”, AIAA 2015-1988 SciTech, Guidance, Navigation, and Control conference, January 2015, Kissimmee, Florida.

C18 Stastny, T. J., Garcia, G., Keshmiri, S., Ewing, M., Lykins, R., and Hale, R., “Real-time Collision and Obstacle Avoidance in Unmanned Aerial Systems”, Kansas Unmanned Systems Conference, October 2013, Manhattan, Kansas.

C17 Bowman, A., Hedden, C., Garcia, G., and Lykins, R., “University of Kansas Aerospace Engineering Flight Systems Research”, ASEE Midwest Conference, September 2012, Rolla, Missouri (2nd Place Outstanding UAV Poster Award).

C16 Garcia, G., and Keshmiri, S., “Online Artificial Neural Network Model Based Nonlinear Model Predictive Controller for the Meridian UAS”, AIAA Guidance, Navigation, and Control Conference, August 2012, Minneapolis, Minnesota.

C15 Garcia, G., and Keshmiri, S. “Integrated Kalman Filter for a Flight Control System with Redundant Measurements”, AIAA Infotech@Aerospace, June 2012, Garden Grove, California.

C14 Lykins, R., Keshmiri, S., Riley, R., and Garcia, G., "Modal Analysis of 1/3-Scale Yak-54 Aircraft through Simulation and Flight Testing", AIAA Atmospheric Flight Mechanics Conference, August 2011, Portland, Oregon.

C13 Garcia, G., and Keshmiri, S., “Nonlinear Model Predictive Controller for Navigation, Guidance and Control of a Fixed-Wing UAV”, AIAA Guidance, Navigation, and Control Conference, August 2011, Portland, Oregon.

C12 Garcia G, Keshmiri, S., and Colgren, R., "H-Infinity Gain Scheduling for the Meridian UAS for a Broader Range of Operation and for Fault Tolerant Applications", 9th IEEE International Conference on Control and Automation, December, 2011, Santiago, Chile, pp. 1174-1180.

C11 Garcia, G., and Keshmiri, S., “Design and Application of an Extended Kalman Filter in a Flight Control System Development”, AIAA Infotech@Aerospace, March 2011, St. Louis, Missouri.

C10 Garcia, G., Keshmiri, S., Colgren, R., “Advanced H-Infinity Trainer Autopilot,” AIAA Modeling and Simulation Technologies Conference, August 2010, Toronto, Ontario.

C9 Blindow, N., Suckro, S., Ruckamp, M., Casassa, G., Garcia, G., and Gacitua, G., “Field Tests and First Results of a 30 MHz Helicopter-borne Pulse Radar (BGR-P30) in Deep Temperate Ice of Patagonia”, International Glaciological Conference, Ice and Climate Change: A View from the South, February 2010, Valdivia, Chile.

C8 Ulloa, D., Garcia, G., Zamora, R., and Casassa, G., “A Simulation Algorithm for Modelling Lateral Returns from Airborne Radio Echo Sounding Signals: Application to Data Collected with the SIRAHT HF Radar in Patagonia”, International Glaciological Conference, Ice and Climate Change: A View from the South, February 2010, Valdivia, CHILE.

C7 Zamora, R., Ulloa, D., Garcia, G., Mella, R., Wendt, J., Casassa, G., Rivera, A., Sarmiento, P., and Uribe, A. “A Low Frequency Airborne Radar Sounder for Temperate Ice”, International Symposium on Radioglaciology and its Applications, June 2008, Madrid, Spain.

C6 Ulloa, D., Uribe, J. A., Garcia, G., Zamora, R., Casassa, G., Rivera, A., A. “A low cost VHF radar for ice thickness measurements”, International Symposium on Radioglaciology and its Applications, June 2008, Madrid, Spain.

C5 Garcia, G., Casassa, G., Ulloa, D., and Zamora, R., “Analysis of a non Electrical Resistive GPR Antenna”, 4th International Workshop on Advanced Ground Penetrating Radar, June 2007, Naples, Italy.

C4 Garcia, G., “Description of the SIRAHT (Airborne Radar System for Temperate Ice) Instrument”, Sailing Workshop: Glaciology in the South with a View from the North, January 2007, A.P. Aquiles.

C3 Rojas, R., and Garcia G., “Modelado Semifísico de Sistemas No Lineales”, XVII Congreso de la Asociación Chilena de Control Automático ACCA2007, January 2007, Temuco, Chile.

C2 Garcia, G., “Radar Aerotransportado para Hielo y su Aplicación en el Monitoreo de Glaciares”, 53° Congreso de la Ingeniería Naval Electrónica, July 2006, Viña del Mar, Chile.

C1 Garcia, G., Muñoz, H., Cassasa, G., Zamora, R., and Rivera, A., “Radar Sounding of Temperate Ice in Southern Chile”, 11th International Conference on Ground Penetrating Radar, June 2006, Columbus, Ohio.

Awards and scholarships

Gold Smith Scholarship	: 2012
Chuan-Tau Edwards and Sumy Lan Aerospace Engineering Scholarship	: 2011
Graduate Studies and School of Engineering Award at KU	: 2011
PhD Fulbright-CONICYT Scholarship	: 2009 - 2012
MSc Scholarship for tuition, Chilean Navy	: 2003 - 2004
MSc Scholarship for tuition, DGIP at UTFSM	: 2003

Appointments and Work Experience

Santo Tomás University, Automation and Industrial Control (Viña del Mar, Chile) – www.ust.cl
- August 2018 – December 2018 : Lecturer

Andres Bello University, Automation and Robotics engineering (Santiago, Chile) – www.unab.cl
- March 2018 – December 2018 : Lecturer

Chilean Naval Polytechnic Academy, Electronic Engineering (Viña del Mar, Chile) – www.apolinav.cl
- February 2018 – December 2018 : Lecturer

Radar Research and Innovations (Overland Park, Kansas) – www.rrinnovations.com
- January 2017 – December 2017 : Area Director Automatic Control (working remotely from Chile).

Aerotenna (Lawrence, Kansas) – www.aerotenna.com
- February 2016 – December 2016 : Chief Scientist of Control Systems (working remotely from Chile).

Microsoft Research (Redmond, Washington) - www.microsoft.com/en-us/research
- September 2015 – December 2015 : Visiting Researcher.

University of Kansas (Lawrence, Kansas)
- February 2013 – 2015 : Postdoctoral Researcher, including:
  - Aerospace Engineering Department - www.ae.engr.ku.edu
  - Information and Telecommunication Technology Center - www.ittc.ku.edu
  - Center for Remote Sensing of Ice Sheets - www.cresis.ku.edu
- 2009 - 2012 : Graduate Research Assistant - www.ae.engr.ku.edu
- 2012 - 2013 : Lecturer - www.ae.engr.ku.edu

Center for Scientific Studies (Valdivia, Chile) – www.cecs.cl
May 2005-December 2008: Researcher *SIRAHT (Airborne Radar Sounder for Temperate Ice).*

Chilean Navy (Chile) – www.armada.cl
- 2005-2008 : *Researcher and Project Manager* - Naval Directorate of Programs, R&D.
- 2002-2003 : *Instructor* - Naval Polytechnic Academy.
  Lecturer.
- 2001 : *Head of Surface Department* - Naval Base, Iquique.
- 1999-2000 : *Executive Officer and Electronic Warfare Officer* - Missile Boat Uribe.
- 1998 : *Missile Boat training* - Chile and Germany.
- 1996-1997 : *Electronic Engineer and Head of Technical Department* - Tactical Naval Simulator.
- 1995 : *Electronic Warfare Officer* - Missile Destroyer Cochrane.
- 1990-1991 : *Weapons Officer* - Antarctic Icebreaker Vessel Piloto Pardo.
- 1989 : *Midshipman* - Chile, Ecuador, USA, Japan, South Korea, China, New Zealand;
  Tall Ship Esmeralda.

Participation in Projects and Research

Florida Atlantic University
February 2019 – present: Modeling and Control of Undulating-Fin Underwater Vessels in Close Formation.

Pontifical Catholic University of Valparaiso
December 2018 – present: Reinforcement Learning Applied to Khepera IV Robot.

Microsoft Research
September – December 2015: *Preventative Monitoring of Infectious Agents (PREMONITION).*
Microsoft Research - IARPA.

Radar Research and Innovations
January – December 2017: Flight control system design.

Aerotenna
January – December 2016: *project+IND0075688*

University of Kansas (past from 2009 to 2015)

- NASA STTR Phase 1 NNX09CF81P
- Paul G. Allen Family Foundation (PGAFF) Grant KUEA#40956
- PGAFF Grant No. FND0071423
- NSF Center for Remote Sensing of Ice Sheet (CReSIS) Grant NSF-0066685
- NSF through CReSIS under Grant ANT-0424589
- NSF and CReSIS Grant DMS-1115118
- NSF Grant # NSF40011
- NASA LEARN Project # NNX15AN94A
- NASA CAN Project # NNX15AN04A
- NASA in Kansas Grant #KAN0064892

Chilean Navy and CECs (Center for Scientific Studies)
May 2005-December 2008: *SIRAHT (Airborne Radar Sounder for Temperate Ice).*
Programs, Research and Development Directorate Chile Navy
(US$ 300,000) – **Co-Principal Investigator (CO-PI)**.

Academic, Research, and Professional Work Brief Description

Florida Atlantic University
- 2019: ***Development of a Closed Loop Law for Heading Control, and Undulating Fin Modeling.*** PIC 33 Microcontroller embedded C coding design for yaw control. Discretized modeling of an undulating fin associated to a 6 DOF rigid body of an underwater robot. Successful closed loop of yaw control navigation.

Microsoft Research
- 2015: ***Development of Guidance Schemes and their Implementation on the Commercial Drone CrazyFlie 2.0***. Development of guidance, navigation, and control for a nano drone for indoor trajectory following using infrared cameras. Used Model predictive control and LQR. Successful closed loop flights.

University of Kansas
- 2013-2015: ***Design and development of agent nonlinear, robust and adaptive flight control system for cooperative flights, using biologically inspired swarm guidance laws; Open final time optimal trajectory generation for loss of control and aircraft recovery; Robust nonlinear flight control systems based on passivity and L2 gain concepts; Laplace equation application for smooth trajectory generation providing obstacle avoidance and target seeking***. Design of flight control systems for several fixed wing aircraft. Successful closed loop flights.

- 2009-2013: ***Failure, Detection and Identification; Aircraft Modelling and Simulation; Extended Kalman Filtering; Robust Linear Control; Nonlinear Guidance Laws; Nonlinear Robust Control; Nonlinear Robust Model Predictive Control; Nonlinear Aerodynamic Estimation***.

Federico Santa Maria Technical University
- 2004-2006: ***Semi-physical and Phenomenological Modeling of Nonlinear Systems***.

Center for Scientific Studies and Chilean Navy

- 2005-2008: ***Airborne Radar High Frequency Sounder for Temperate Ice - SIRAHT***: The development of a high-frequency airborne radar specifically designed for the sounding of temperate ice. The system operated at a central frequency of 1MHz and consisted of an impulse transmitter with an output voltage up to 5000V and a digital receiver with a maximum gain of 80 dB. The radar was deployed on board a CASA 212 aircraft, which also carried a laser altimeter, an inertial navigation system, a digital camera and a GPS receiver. Preliminary results were obtained at Glaciar Tyndall, Campo de Hielo Sur (Southern Patagonia Ice field), where an ice depth of 670m was reached.

Chilean Navy

- 1992-1994: ***Real Time Digital Processing and Maritime Radar Interfacing***: A real-time display and noise processing radar data was developed. A dedicated electronic hardware was assembled to acquire the radar video, trigger, and antenna azimuth signals and convert them into a personal computer readable data. Its ports managed by hardware interruption logic, were used to input the data to be processed and displayed in real-time.

Language skills

Spanish : native speaker.
English : fluent.

Teaching positions

Santo Tomás University

- 2018 : ACI-013 Automatic Control II.
- 2018 : ACI-006 Automatization Systems and Industrial Control.

Andres Bello University

- 2018 : AUT-1303 Electronics and Digital systems.
- 2018 : AUT-1302 Fundamentals of Programming.

University of Kansas

- 2015 : AE-551 Flight Dynamics and Control II (guest lecturer).
- 2014 : AE-551 Flight Dynamics and Control II (guest lecturer).
- 2013 : AE-755 Robust and Nonlinear Control.
- 2013 : AE-550 Flight Dynamics and Control I (guest lecturer).
- 2012 : AE-755 Robust and Nonlinear Control.

Chilean Naval Polytechnic Academy

- 2018 : Automatic Control (2)
- 2018 : Digital Control systems
- 2018 : Statistical Theory of Detection (2)
- 2003 : Statistical Theory of Detection
- 2003 : Linear System Analysis.
- 2002 : Linear System Analysis.
- 1997 : Propagation and Waveguides

Academic and Professional Internship and Visiting positions

Microsoft Research (Redmond, Washington State): September-December 2015.
NASA Ames (Moffett Federal Airfield in California's Silicon Valley): June 2012.
Chilean Navy Shipbuilding - ASMAR (Talcahuano, Chile): March 1994.

Thesis/Dissertation and Main Coursework

Thesis/Dissertation

Ph. D. Decentralized Robust Nonlinear Model Predictive Controller for Unmanned Aerial Systems
M. Sc. Application of Commutative and Differential Algebras to Dynamic Systems Semi-physical Modelling.
B. Sc. Scanning Radar Data Real Time Display on a Personal Computer.

Main coursework during graduate studies (M. Sc. and Ph. D.)

- Probability and Stochastic Processes
- Multivariable Control
- Mathematic Methods in Automatic Control
- Models for Control
- Adaptive Control
- Modern Techniques in Automatics
- Advanced Control Systems Design
- System Dynamics
- Robust Control of Nonlinear systems
- Calculus of Variations
- Computational Fluid Dynamics
- Applied Optimal Control
- Introduction to Flight Test Engineering
- Fundamentals of Aerodynamics
- Fundamentals of Jet Propulsion

Ph. D. GPA: 3.95

Manuscript Peer Reviewer:

- Aerospace Science and Technology – Elsevier.
- IEEE Transactions on Systems, Man and Cybernetics: Systems.
- International Journal of Robust and Nonlinear Control - Wiley.
- Journal of Industrial and Management Optimization.
- IETE Journal of Research
- International Conference on Unmanned Aircraft System.
- IFAC Journal of Systems and Control
- Journal of Industrial and Management Optimization.
- Optimal Control, Applications and Methods.
- Simulation Modelling Practice and Theory.
- Symmetry, MDPI.
- International Journal of Control.
- IFAC Conference on Advances in Proportional-Integral-Derivative Control.
- Journal of Systems and Control Engineering.
- Sensors – MDPI.
- European Control Conference 2019.
- Electronics – MDPI.
- Control Engineering Practice – Elsevier.
- Journal of Aerospace Engineering - SAGE.
- Computers and Electrical Engineering, International Journal – Elsevier.
- IEEE Transactions on Systems, Man and Cybernetics: Systems.
- Journal of Process Control - Elsevier.
- IEEE International Conference on Control & Automation.
- International Journal of Aerospace Engineering – Hindawi.
- IEEE Transactions on Cybernetics.
- Journal of Dynamic Systems, Measurements and Control - ASME.
- Journal of Control Science and Engineering – HINDAWI.
- Journal of Applied Computing and Informatics.
- British Journal of Applied Science & Technology.
- Australian Control Conference.

Graduate Committee Member:

- Ph.D. in Aerospace Engineering Department at University of Kansas : 2013-2014.
- M.Sc. in Mechanical Engineering Department at Pontificia Universidad Católica de Chile : 2007.

Technical skills

Professional user of:

- PIC33 and Arduino Microcontrollers.
- MATLAB and Simulink.
- C programming language.
- GNU Octave and XCos Scilab (open source software).

Membership

- ***AIAA*** – The American Institute of Aeronautics and Astronautics.
- ***Golden Key International Honour Society***.
- ***Sigma Gamma Tau*** - American Honour Society in Aerospace Engineering.

Biographies

Who's Who in the World: 2009 (27th Edition), 2010 (28th Edition) and 2011 (29th Edition).
Who's Who in America: 2013 (68th Edition) and 2014 (69th Edition).