

**Dr. Armando Antonio Rodriguez**  
Professor of Electrical Engineering  
*Intelligent Embedded Systems Laboratory (IeSL)*  
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### Areas of Research

- Modeling and control of advanced aerospace systems, hypersonic vehicles, missile systems, UAVs, micro air-vehicles (MAVs), intelligent autonomous vehicles, robotic systems
- Modeling and control of socio-ecological and bio-economic systems
- Modeling and control of semiconductor manufacturing processes
- Modeling, control, and design of low power electronic systems
- Robust fault-tolerant, multivariable, sampled-data control of nonlinear distributed parameter (infinite-dimensional) and lumped parameter (finite-dimensional) dynamical systems.
- Approximation of complex dynamical systems.
- Design and rapid prototyping of fault-tolerant embedded systems with health management capabilities.
- *MoSART - Modeling, Simulation, Animation, and Real-Time Control of Dynamical Systems*
- *FAME - Flexible Autonomous Machines operating in an uncertain Environment.*  
See <http://www.eas.asu.edu/~aar/research/mosart/mosart.html>

### Education

*Ph.D. in Electrical Engineering and Computer Science*, Massachusetts Institute of Technology, June 1990.  
*Electrical Engineering Degree*, Massachusetts Institute of Technology, June 1989.  
*M.S. in Electrical Engineering and Computer Science*, Massachusetts Institute of Technology, June 1987.  
*B.S. in Electrical Engineering and Computer Science*, Polytechnic Institute of New York, June 1983.  
Graduated *Summa Cum Laude*.

### Positions Held and Prestigious Appointments

- 2011-2014. MEMBER, NATIONAL ACADEMIES ARL TECHNICAL ASSESSMENT BOARDS, **National Academy of Engineering**, Washington, DC.
- National Academies Panel on Mechanical Science and Engineering, Intelligence and Control, Army Research Laboratory (ARL), Adelphi, MD, July 8-10, 2015
  - National Academies Panel on Information Science for Autonomous Systems, Army Research Laboratory (ARL), Adelphi, MD, August 13-15, 2013
  - National Academies Panel on Survivability and Lethality Analysis, ARL Survivability and Lethality Analysis Directorate (SLAD), Aberdeen Proving Grounds, MD, May 29-June 1, 2012

- National Academies Panel on Survivability and Lethality Analysis, ARL Survivability and Lethality Analysis Directorate (SLAD), Aberdeen Proving Grounds, MD, May 29-June 1, 2012
  - National Academies Panel on Survivability and Lethality Analysis, Survivability and Lethality Analysis Directorate (SLAD), White Sands, NM, August 2-5, 2011
  - National Research Council (NRC) Review of ARL Autonomous Systems, ARL Vehicle Tech Directorate (VTD), Aberdeen Proving Grounds, MD, July 11-13, 2011
- 12/05–12/09 MEMBER, COMMITTEE ON ENGINEERING EDUCATION, **National Academy of Engineering**, Washington, DC. Development of Research and Research Capacity Building Assessment Metrics for NSF.
- 8/04–07 CO-DIRECTOR, NSF-LSAMP BRIDGE TO THE DOCTORATE PROGRAM, **Arizona State University**, Tempe, AZ. Departments of Electrical Engineering and Mathematics.
- 5/04–pres. PROFESSOR. **Arizona State University**, Tempe, AZ.  
Department of Electrical Engineering.
- 5/04–8/11 CONTROLS CONSULTANT. **NASA Ames Research Center**, Moffett Field, CA.
- 8/96–5/04 ASSOCIATE PROFESSOR. **Arizona State University**, Tempe, AZ.  
Department of Electrical Engineering.
- 5/98–1/00 CONTROLS CONSULTANT. **Honeywell Air Transport Systems**, Phoenix, AZ.
- 6/96–8/96 BOEING FACULTY FELLOW. **Boeing Defense and Space Systems**, Seattle, WA.
- 8/90–7/96 ASSISTANT PROFESSOR. **Arizona State University**, Tempe, AZ.  
Department of Electrical Engineering.
- 5/93–8/93 AFOSR RESEARCH ASSOCIATE. **Eglin Air Force Base**, Fort Walton Beach, FL.
- 5/92–8/92 AFOSR RESEARCH ASSOCIATE. **Eglin Air Force Base**, Fort Walton Beach, FL.
- 1/90–6/90 INSTRUCTOR. **Massachusetts Institute of Technology**, Cambridge, MA.
- 5/87–9/87 CONTROL SYSTEM DESIGN ENGINEER. **Raytheon Missile Systems**, Bedford, MA.
- 1/86–6/86 TEACHING ASST. **Massachusetts Institute of Technology**, Cambridge, MA.
- 5/84–9/84 ENGINEER. **AT&T Bell Laboratories**, Holmdel, NJ.
- 5/83–9/83 ENGINEER. **AT&T Bell Laboratories**, Holmdel, NJ.
- 5/81–9/82 ASST. ENGINEER. **IBM**, Poughkeepsie, NY.

### Areas of Teaching

Electrical Networks, Signals and Systems, Modeling of Dynamical Systems, Feedback Systems, Linear Systems, Nonlinear Systems, Multivariable Control, Control of Distributed Parameter Systems, Digital and Sampled-Data Design, Transform Theory, Rapid Prototyping, Embedded Systems, Engineering Design.

**Societies** Tau Beta Pi, Eta Kappa Nu, Sigma Chi, IEEE (Senior Member), AIAA, ASEE, SHPE.  
ASU IEEE Student Branch Faculty Advisor/Mentor (1997-2003), ASU MAES Student Branch Faculty Advisor/Mentor (2012-present).

**Honors** ASU Fulton School of Engineering Top 5% Teaching Award, 2013.  
Ralf Yorke Memorial Paper Prize: *Journal of Ecology and Society*, 2010  
IEEE Outstanding Faculty Advisor Award (International), 2004.  
IEEE Phoenix Section Outstanding Counselor Award, 2004.  
IEEE Senior Member, 2003.  
Interactive Controls E-Books accepted into *MathWorks Book Program*, 2001, 2002, 2003-2006.  
Recommended for Fulbright Fellowship by Council for International Exchange of Scholars (CIES), 2003.  
Arizona State University Professor of the Year Finalist, 2000, 2001, 2002, 2003.

2002 White House Presidential Awards Panel.  
Who's Who In Education, 2002.  
IEEE Phoenix Section Faculty Advisor Recognition Award, 2002, 2003.  
*MoSART-FAME* Research-Mentoring Program Recognized in AT&T 2001-2002 Citizenship Report.  
ASU EE Best Senior Design Project Award, Sp98, Fa99, Sp2002.  
Committee on Science, Engineering, and Public Policy (COSEPUP) Convocation Guest, 2001.  
White House Presidential Award Guest, 2001.  
Addressed White House Presidential Award Recipients, 2000.  
ASU Faculty Fellow, 2000.  
IEEE Phoenix Section Award for Outstanding Mentoring and Professionalism, 2000.  
IEEE Center of Excellence Award for *FAME* Research, 2000.  
Honeywell Sweatt Corporate Award Committee - Eminent Engineering Expert, 1998-2000.  
CEAS Teaching Excellence Award, 1999 (Nominated in 97, 98).  
IEEE Outstanding Faculty Advisor Award (International), 1999.  
IEEE Phoenix Section Outstanding Faculty Advisor Award, 1999.  
White House Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, September 9, 1998. Network coverage of Press Conference with President Bill Clinton.  
IEEE Southwest Conference Best Paper Award (Chen-I Lim: 98, John Koenig: 99).  
ASU Leadership Development Team and Student Organization Resource Center Award, 1998.  
Boeing A.D. Welliver Faculty Fellowship, 1996.  
Who's Who in the World, 1995. Who's Who in Science & Engineering, 1994.  
Session Best Presentation Award: American Control Conference, 93, 94.  
ASU Student Affairs Recognition Certificate.  
ASU Young Faculty CEAS Teaching Excellence Award, 1993 (Nominated in 92).  
AFOSR Faculty Research Award, 1993.  
AFOSR Faculty Research Initiation Award, 1992.

### **Prestigious Nominations**

Nominated for ASU Professor of the Year Award, 2005.  
Nominated by ASU Faculty for Carnegie Foundation-CASE U.S. Professor of the Year, 2003.  
Nominated by ASU Faculty for ASU Centennial Professorship, 2002.  
Nominated by ASU Faculty for ASEE Fred Merryfield Design Award, 2001.  
Nominated by ASU Faculty for ASU Burlington Faculty Achievement Award, 1993.

### **Student Organization Awards**

IEEE International Outstanding Branch Award, 2000, 2003.  
IEEE International Web Site Award, 2003 (2<sup>nd</sup> in world).  
ASU Student Organization Achievement Recognition Award, 2003.  
ASU Student Affairs Recognition Award, 2001.  
IEEE Region 6 Student Branch Web Site Award, 1999, 2000.  
ASU IEEE Student Organization Achievement Recognition Award, 1999, 2000.  
IEEE Student Branch Web Site Bronze Award (International), 1999.  
ASU Leadership Development Team and Student Organization Resource Center Award, 1998.

### **Personal Data**

Born on July 15, 1961, New York, NY. United States citizen. Hispanic-American. Fluent in Spanish.  
Prior security clearances held: secret.

# 1 Publications

Over 200 publications - including papers, 3 text books, book chapters, workshop proceedings, *MoSART-FAME* program media articles, and technical reports.

## Papers

1. A.A. Rodriguez, O. Cifdaloz, J.M. Anderies, M.A. Janssen, and J.J. Dickeson, "Confronting Management Challenges in Highly Uncertain Natural Resource Systems: A Robustness-Vulnerability Trade-Off Approach," *Environmental Modeling and Assessment*, 16(1):15(36), 2011.
2. O. Cifdaloz, A. Regmi, J.M. Anderies, and A.A. Rodriguez, "Robustness, Vulnerability, and Adaptive Capacity in Small-Scale Social-Ecological Systems: The Pampa Irrigation System in Nepal," *J. of Ecology and Society*, Vol. 15, No. 3, Article 39, 2010. <http://www.ecologyandsociety.org/vol15/iss3/art39/>, 46 pages, Received *Ralf Yorke Memorial Paper Prize: J. of Ecology and Society*.
3. L. Yang, J. Si, K. Tsakallis, and A.A. Rodriguez, "Direct Heuristic Dynamic Programming for Non-linear Tracking Control with Filtered Tracking Error," *IEEE Transactions on Systems, Man, and Cybernetics - Part B*, Vol. 39, Issue 6, pp. 1617–1622, December 2009.
4. L. Yang, J. Si, K. Tsakallis, and A.A. Rodriguez, "Performance Evaluation of Direct Heuristic Dynamic Programming using Control-Theoretic Measures," *Journal of Intelligent and Robotic Systems*, Vol. 55, Issue 2-3, pp. 177–201, July 2009.
5. N.L. Fortenberry, E.T. Caddy, B.C. Clewell, V. Flaris, E. Jolly, D. Martin, H. Macdonald, M. Poston, A.A. Rodriguez, R. Spalter-Roth, "Metrics for Measuring Broadening Participation in NSF Programs," *J. of Women and Minorities in Science and Engineering*, Vol. 15, Issue 3, pp. 245–261, 2009.
6. M. Anderies, A.A. Rodriguez, M. Janssen, and O. Cifdaloz, "Panaceas, Uncertainty, and the Robust Control Framework in Sustainability Science," *Proceedings of the National Academy of Science*, September 25, 2007, 104(39) pp. 15194–15199. Special Issue: *Beyond Panaceas: Crafting Diverse Institutional Arrangements for Governing Diverse Social-Ecological Systems*, Editor: Elinor Ostrom (2009 Nobel Laureate in Economic Sciences).
7. A.A. Rodriguez, R.P. Metzger, O. Cifdaloz, and T. Dhirakdanon, "Description of a Modeling, Simulation, Animation, and Real-Time Control (MoSART) Environment for a Class of Electromechanical Systems," *IEEE Transactions on Education*, Vol. 48, No. 3, 2005, pp. 359–374.
8. M. Islam, D. Allee, S. Konasani, and A.A. Rodriguez, "A Low-Cost Digital Controller for a Switching DC-DC Converter with Improved Voltage Regulation," *IEEE Power Electronics Letters*, Vol. 2, No. 4, Dec. 2004, pp. 121–124.
9. A.A. Rodriguez, R.P. Metzger, O. Cifdaloz, T. Dhirakdanon, and B. Welfert, "Modeling, Simulation, Animation, and Real-Time Control (MoSART) for a Class of Electromechanical Systems: A System-Theoretic Approach," *International Journal of Mathematical Education in Science and Technology*, Vol. 35, No. 6, Nov-Dec, 2004, pp. 877–896.
10. S.C. Warnick and A.A. Rodriguez, "A Systematic Anti-windup Strategy and the Longitudinal Control of a Platoon of Vehicles with Control Saturations," *IEEE Transactions on Vehicular Technology*, Vol. 49, No. 3, May 2000, pp. 1006–1016.
11. D.R. Carter and A.A. Rodriguez, "Weighted  $\mathcal{H}^\infty$  Mixed-Sensitivity Minimization for Stable Distributed Parameter Sampled Data Control," *Kybernetika*, Volume 35, Number 5, 1999, pp. 527–554.
12. A.A. Rodriguez and M.L. Sonne, "Evaluation of Missile Guidance and Control Systems," *Simulation: The Journal of the Society for Computer Simulation*, Vol. 68, No. 6, June, 1997, pp. 363–376.
13. A.A. Rodriguez and J.R. Cloutier, "Performance Enhancement for a Missile in the Presence of Saturating Actuators," *AIAA Journal of Guidance, Control, & Dynamics*, Vol 19, January–February, 1996, pp. 38–46.
14. A.A. Rodriguez and Y. Wang, "Performance Enhancement for Unstable Bank-to-Turn (BTT) Missiles with Saturating Actuators," *International Journal of Control*, Vol. 63, No. 4, 1996, pp. 641–678.
15. A.A. Rodriguez, "Weighted  $\mathcal{H}^\infty$  Mixed-Sensitivity Minimization for Stable MIMO Distributed Parameter Systems," *IMA Journal of Mathematical Control and Information*, December, 1995, pp. 219–233.

16. A.A. Rodriguez and R. Aguilar, "Graphical Visualization of Missile-Target Air-to-Air Engagements: An Educational Tool for Designing and Evaluating Missile Guidance and Control Systems," *Journal of Computer Applications in Engineering Education*, Vol. 3, No. 1, 1995, pp. 5–20.
17. A.A. Rodriguez and M.A. Dahleh, "On the Computation of Induced Norms for Non-Compact Hankel Operators Arising From Distributed Control Problems," *Systems & Control Letters* 19, 1992, pp. 429–438.
18. K. Puttannaiah, A.A. Rodriguez, K. Mondal and J.A. Echols, "A Generalized Mixed-Sensitivity Convex Approach to Hierarchical Multivariable Inner-Outer Loop Control Design Subject to Simultaneous Input and Output Loop Breaking Specifications," *2016 American Control Conference, IEEE*, Boston, MA, 2016.
19. D.G. Cartagena and A.A. Rodriguez, "Modeling of a Multi-Core Processor Thermal Dynamics for Development of Dynamic Thermal Management Controllers," *2016 American Control Conference, IEEE*, Boston, MA, 2016.
20. K. Puttannaiah, J.A. Echols, K. Mondal and A.A. Rodriguez, "Analysis and Use of Several Generalized  $\mathcal{H}^\infty$  Mixed Sensitivity Frameworks for Stable Multivariable Plants subject to Simultaneous Output and Input Loop Breaking Specifications," *Proceedings of the 54th IEEE Conference on Decision and Control*, Osaka, Japan, 2015, pp. 6617-6622.
21. K. Puttannaiah, J.A. Echols and A.A. Rodriguez, "A Generalized  $\mathcal{H}^\infty$  Control Design Framework for Stable Multivariable Plants subject to Simultaneous Output and Input Loop Breaking Specifications," *2015 American Control Conference, IEEE*, Chicago, IL, 2015, pp. 3310-3315.
22. J.A. Echols, K. Puttannaiah, K. Mondal and A.A. Rodriguez, "Fundamental Vehicle and Control System Design Issues for Scramjet-Powered Hypersonic Vehicles," *AIAA Guidance, Navigation & Control Conference*, Kissimmee, FL, 2015.
23. M. Thompson, J. Burnett, A. Batra, D. Ixtabalan, D. Tran, A. Rodriguez, and B. Steele, "Experimental Design of a Flapping Wing Micro Air Vehicle through Biomimicry of Bumblebees," 2015 AIAA Infotech at Aerospace, AIAA, 6 pages, 2015.
24. M.R. Anderson-Rowland, A.A. Rodriguez and A.E. Grierson, "Helping Undergraduate Engineering Students Discover Their Interests (and Reduce Their Fear of Research)," *IEEE Frontiers in Education Conference*, El Paso, TX, 2015.
25. M.R. Anderson-Rowland, A.A. Rodriguez and A.E. Grierson, "Getting the Attention of Underrepresented Minority Students to Consider Engineering as a Career," *IEEE Frontiers in Education Conference*, El Paso, TX, 2015.
26. M.R. Anderson-Rowland and A.A. Rodriguez, "Sophomore Transfers: Who Are They and What Support Do They Need?" 2015 American Society for Engineering Education Proceedings, Seattle, WA, 12 pages, 2015.
27. M.R. Anderson-Rowland and A.A. Rodriguez, "METSTEP After Six Years," 2015 American Society for Engineering Education Proceedings, Seattle, WA, 7 pages, 2015.
28. M.R. Anderson-Rowland and A.A. Rodriguez, "The Evolution of a Collaborative Interdisciplinary Research Community," 2015 American Society for Engineering Education Proceedings, Seattle, WA, 10 pages, 2015.
29. M.R. Anderson-Rowland, A.A. Rodriguez and A.E. Grierson, "Discovering How to Get Engineering and Computer Science on the Radar of Community College Students," 2015 American Society for Engineering Education Proceedings, Seattle, WA, 9 pages, 2015.
30. S. Sridharan, J.A. Echols, A.A. Rodriguez and K. Mondal, "Integrated design and control of hypersonic vehicles," *IEEE American Control Conference*, Portland, OR, 2014, pp. 1371-1376.
31. M.R. Anderson-Rowland, A.A. Rodriguez and A.E. Grierson, "Determining student beliefs about engineering," *IEEE Frontiers in Education Conference*, Madrid, Spain, 2014, pp. 1-7.
32. M.R. Anderson-Rowland, A.A. Rodriguez, A.E. Grierson, R.A. Hall, P.B. McBride, R. Pangasa, C.H. Vangilder, R. Cox and T. R. Palmer, "Establishing a Win-Win Partnership between a University and Non-Metropolitan Community Colleges," *American Society for Engineering and Education Proceedings*, Indianapolis, IN, 2014.

33. S. Sridharan, and A.A. Rodriguez, "Impact of Control Specifications on Vehicle Design for Scramjet-Powered Hypersonic Vehicles," pp. 1 – 18, *AIAA Guidance, Navigation, and Control Conference*, 2013.
34. S. Sridharan, and A.A. Rodriguez, "Design of Portfolio Optimization Strategies and Limitations of Performance Analysis," *IASTED Control and Applications*, 2013.
35. A.A. Rodriguez, and M.R. Anderson-Rowland, "Comprehensive Framework for Significantly Increasing the Number of Highly Trained Engineers: A Model Academic Success and Professional Development (ASAP) Class - Lessons Learned and Strategies Moving Forward," *2013 Frontiers in Education Conference*, Oklahoma City, OK, October 23-26, 2013, 7 pages.
36. M.R. Anderson-Rowland, A.A. Rodriguez, L.D. Dunn, and S.L. Leite, "A Focus Group Evaluation of First-Year Students From Metropolitan Community Colleges," *Women in Engineering ProActive Network, WEPAN Proceedings*, Atlanta, GA, 2013.
37. M.R. Anderson-Rowland, A.A. Rodriguez, and A.E. Grierson, "Why Some Community College Students Choose Engineering and Some Don't," *2013 American Society for Engineering and Education Proceedings*, Atlanta, GA, June 2013, 16 pages.
38. M.R. Anderson-Rowland, A.A. Rodriguez, and A.E. Grierson, "S-STEM Programs for Transfer and Non-Transfer Upper Division and Graduate Engineering and Computer Science Students," *2013 American Society for Engineering and Education Proceedings*, Atlanta, GA, June 2013, 7 pages.
39. M.R. Anderson-Rowland, A.A. Rodriguez, A.E. Grierson, R.A. Hall, P.B. McBride, J.H. Bailey, R. Pangasa, C. Vangilder, and R. Cox, "METSTEP: Third Year Review," *2013 American Society for Engineering and Education Proceedings*, Atlanta, GA, June 2013, 12 pages.
40. S. Sridharan and A.A. Rodriguez, "Performance Based Control-Relevant Design for Scramjet-Powered Hypersonic Vehicles," pp. 1 – 17, *AIAA Guidance, Navigation, and Control Conference*, AIAA 2012-4469, 2012.
41. S. Sridharan, A.A. Rodriguez, J.J. Dickeson, and D. Soloway, "Constraint Enforcement and Robust Tube-Based Control for Scramjet-Powered Hypersonic Vehicles with Significant Uncertainties," pp. 4619 – 4624, *Proc. of the American Control Conference*, 2012.
42. A.A. Rodriguez and M.R. Anderson-Rowland, "Critical Questions of Engineering Students by Gender and Ethnicity," *2012 Proceedings of Frontiers in Education*, Seattle, Washington, October 2012, 6 pages.
43. M.R. Anderson-Rowland, A.A. Rodriguez, and A.E. Grierson, "Determining the Community College Audience," *2012 American Society for Engineering and Education Proceedings*, San Antonio, TX, June 2012, 11 pages.
44. M.R. Anderson-Rowland, A.A. Rodriguez, R.A. Hall, P.B. McBride, R. Pangasa, J.M. Saber, C. Vangilder, and A. Grierson, "Leveraging S-STEM Scholarship Programs," *2012 American Society for Engineering and Education Proceedings*, San Antonio, TX, June 2012, 8 pages.
45. A.A. Rodriguez and M.R. Anderson-Rowland, "Critical Questions to Which Engineering Students Need Answers," *2012 American Society for Engineering and Education Proceedings*, San Antonio, TX, June 2012, 8 pages.
46. M.R. Anderson-Rowland, A.A. Rodriguez, L.D. Dunn, and S.L. Leite, "A Focus Group Evaluations of an Academic Success Program and support system for Transfer Students," *2012 WEPAN Proceedings*, Columbus, Ohio, June 2012, 11 pages.
47. S. Sridharan, J.J. Dickeson, and A.A. Rodriguez, "Impact of Plume Modeling on the Design and Control for a Class of Air-Breathing Hypersonic Vehicles," pp. 509 - 531, *AIAA Guidance, Navigation, and Control Conference*, AIAA-2011-6229, 2011.
48. S. Sridharan, D. Chitturi, Armando A. Rodriguez, "A Receding Horizon Control Approach to Portfolio Optimization Using a Risk-Minimax Objective for Wealth Tracking," *IEEE International Conference on Control Applications*, 2011, pp. 1282–1287.
49. M.R. Anderson-Rowland, A.A. Rodriguez, and A.E. Grierson, "Making a Difference: How to Recruit More Community College Women and Underrepresented Minority Students Into Engineering and Computer Science," *2011 American Society for Engineering and Education Proceedings*, Vancouver, British Columbia, Canada, June 2011, 9 pages. [www.asee.org](http://www.asee.org)

50. M.R. Anderson-Rowland, A.A. Rodriguez, J.H. Bailey, A.E. Grierson, R. Pangasa, C. Vangilder, R.B. McBride, and R.A. Hall, "STEP Grant Challenges and Results: Motivated Engineering Transfer Students From Non-Metropolitan Community Colleges," *2011 American Society for Engineering and Education Proceedings*, Vancouver, British Columbia, Canada, June 2011, 13 pages. [www.asee.org](http://www.asee.org)
51. J.J. Dickeson, A.A. Rodriguez, S. Sridharan, and A. Korad, "Elevator Sizing, Placement, and Control-Relevant Tradeoffs for Hypersonic Vehicles," pp. 1 – 22, *AIAA Guidance, Navigation, and Control Conference*, AIAA-2010-8339, 2010.
52. M.R. Anderson-Rowland and A.A. Rodriguez, "Motivated Engineering Transfers - STEM Talent Expansion Program (METSTEP)," *Proceedings of the 2010 American Society for Engineering Education Annual Conference & Exposition*, Louisville, KY, June 2010, 12 pages, CD-ROM and [www.asee.org](http://www.asee.org)
53. J.J. Dickeson, A.A. Rodriguez, S. Sridharan, J. Benavides, D. Soloway, A. Kelkar, and J.M. Vogel, "Decentralized Control of an Airbreathing Scramjet-Powered Hypersonic Vehicle," pp. 1–37, *AIAA Guidance, Navigation, and Control Conference*, AIAA-2009-6281, Chicago, Illinois, Aug. 10-13, 2009.
54. D. Soloway, A.A. Rodriguez, J.J. Dickeson, O. Cifdaloz, and J. Benavides, S. Sridharan, A. Kelkar, and J.M. Vogel, "Constraint Enforcement for Scramjet-Powered Hypersonic Vehicles with Significant Aero-Elastic-Propulsion Interactions," pp. 3154 – 3159, *Proc. of the American Control Conference*, St. Louis, Missouri, June 10-12 2009.
55. A.A. Rodriguez, J. J. Dickeson, S. Sridharan, A. Korad, J. Khatri, J. Benavides, D. Soloway, and A. Kelkar, and J.M. Vogel, "Control-Relevant Modeling, Analysis, and Design for Scramjet-Powered Hypersonic Vehicles," *16<sup>th</sup> AIAA/DLR/DGLR International Space Planes and Hypersonic Systems and Technologies Conference*, AIAA-2009-7287, Bremen, Germany, October 19-22, 2009, pp. 1 – 45. Invited Paper.
56. J.M. Vogel, A.G. Kelkar, G. Inger, C. Whitmer, A. Sidlinger, A.A. Rodriguez, "Control-Relevant Modeling of Hypersonic Vehicles," *Proc. of the American Control Conference*, St. Louis, Missouri, June 10-12 2009, pp. 2519 – 2524.
57. M.R. Anderson-Rowland and A.A. Rodriguez, "Life Planning for Engineering Students," *39th ASEE/IEEE Frontiers in Education Conference*, San Antonio, TX, October 2009, 6 pages, <http://fie-conference.org/fie2009/>
58. A.A. Rodriguez, J.J. Dickeson, O. Cifdaloz, R. McCullen, J. Benavides, S. Sridharan, A. Kelkar, J. M. Vogel, and D. Soloway, "Modeling and Control of Scramjet-Powered Hypersonic Vehicles: Challenges, Trends, & Tradeoffs," pp. 1 – 40, *AIAA Guidance, Navigation, and Control Conference*, AIAA-2008-6793, Honolulu, HI, 18-21 August 2008.
59. O. Cifdaloz, A.A. Rodriguez, R. McCullen, and J.M. Anderies, "Control of Distributed Parameter Systems Subject to Convex Constraints: Application to Irrigation Systems and Hypersonic Vehicles," *Proceedings of the 47<sup>th</sup> IEEE Conference on Decision and Control*, Cancun, Mexico, December 9-11, 2008, pp. 865-870.
60. O. Cifdaloz, A.A. Rodriguez, R. McCullen, J.J. Dickeson, " $\mathcal{H}^\infty$  Mixed-Sensitivity Optimization for Distributed Parameter Plants Subject to Convex Constraints," *Proceedings of the 46<sup>th</sup> IEEE Conference on Decision and Control*, December 10–11, 2007, New Orleans, LA, pp. 866–871. Invited paper.
61. J.J. Dickeson, D. Miles, O. Cifdaloz, A.A. Rodriguez, " $\mathcal{H}^\infty$  Gain-Scheduled Hover-to-Cruise Conversion for an LPV Tilt-Wing Rotorcraft Model," *Proceedings of the 46<sup>th</sup> IEEE Conference on Decision and Control*, December 10–11, 2007, New Orleans, LA, pp. 2773–2778.
62. A.A. Rodriguez, O. Cifdaloz, M. Phielipp, J.J. Dickeson, "Description of a Modeling, Simulation, Animation, and Real-Time Control (MoSART) Environment for a Class of 6-DOF Dynamical Systems," *Proceedings of the American Control Conference*, July 11-13, 2007, New York City, N.Y., pp. 5215-5220.
63. J.J. Dickeson, O. Cifdaloz, D. Miles, V. Wells, and A.A. Rodriguez, "Robust  $\mathcal{H}^\infty$  Gain-Scheduled Hover-to-Cruise Conversion for a Tilt-Wing Rotorcraft in the Presence of CG Variations," *Proceedings of the American Control Conference*, July 11-13, 2007, New York City, N.Y., pp. 5266–5271.
64. L. Yang, J. Si, K.S. Tsakalis, A.A. Rodriguez, "Performance Analysis of Direct Heuristic Dynamic Programming using Control-Theoretic Measures," *International Joint Conference on Neural Networks (IJCNN)*, Orlando, FL, Aug 12-17, 2007, pp. 2504-2509.
65. O. Cifdaloz, D. Cartagena, A.A. Rodriguez, "Constrained  $\mathcal{H}^\infty$  Mixed-Sensitivity Optimization for Infinite-Dimensional Plants: Applications to Thermal, Structural, and Aircraft Systems," *Proceedings of the 45<sup>th</sup> IEEE Conference on Decision and Control*, December 13–15, 2006, San Diego, CA, pp. 1209–1214.

66. J.J. Dickerson, O. Cifdaloz, D. Miles, P. Koziol, V.L. Wells, A.A. Rodriguez, "Robust  $\mathcal{H}^\infty$  Gain-Scheduled Conversion for a Tilt-Wing Rotorcraft," *Proceedings of the 45<sup>th</sup> IEEE Conference on Decision and Control*, December 13–15, 2006, San Diego, CA, pp. 5882–5887.
67. O. Cifdaloz, A.A. Rodriguez, M. Phielipp, J. Dickerson, D. Miles, P. Koziol, "Description of a *Modeling, Simulation, Animation, and Real-Time Control (MoSART)* Environment for a Broad Class of Dynamical Systems," *Proceedings of the 45<sup>th</sup> IEEE Conference on Decision and Control*, December 13–15, 2006, San Diego, CA, pp. 3906–3911.
68. O. Cifdaloz, A.A. Rodriguez, "Constrained  $\mathcal{H}^\infty$  Mixed-Sensitivity Optimization for Stable Infinite-Dimensional Plants," *Proceedings of the 17<sup>th</sup> International Symposium on Mathematical Theory of Networks and Systems*, July 24–28, 2006, Kyoto, Japan, pp. 2363–2371, Invited.
69. O. Cifdaloz, S. Konasani, A.A. Rodriguez, M.M. Islam, D.R. Allee, "DC-DC Buck Converter Design: A Sampled-Data Approach," *Proceedings of the American Control Conference*, June 14–16, 2006, Minneapolis, MN, pp. 2765–2770.
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174. H.K. Reynolds and A.A. Rodriguez, " $\mathcal{H}^\infty$  Control of a Twin Lift Helicopter System," *Proceedings of the 31<sup>st</sup> IEEE Conference on Decision and Control*, Tucson, AZ, December 16–18 1992, pp. 2442–2447.
175. A.A. Rodriguez and M.A. Dahleh, "Wiener-Hopf Control of Stable Infinite-Dimensional Systems," *Proceedings of the American Control Conference*, Boston, MA, June 26–28 1991, pp. 2160–2165.
176. A.A. Rodriguez and M.A. Dahleh, "Weighted  $\mathcal{H}^\infty$  Optimization for Stable Infinite-Dimensional Systems using Finite-Dimensional Techniques," *Proceedings of the 29th IEEE CDC*, Honolulu, Hawaii, December 5–7 1990, pp. 1814–1820.
177. A.A. Rodriguez and M. Athans, "Multivariable Control of a Twin Lift Helicopter System using the LQG/LTR Design Methodology," *Proceedings of the American Control Conference*, Seattle, WA, June 18–20 1986, pp. 1325–1332, Invited Paper.

### Books

178. **A.A. Rodriguez**, *Analysis and Design of Feedback Control Systems*, Control3D, LLC, ISBN: 1-932451-00-5, 2nd edition, 990 pp., 1 interactive DVD (400 additional pp.), 2004. (Adopted at University of Illinois, Urbana-Champaign.)
179. **A.A. Rodriguez**, *Analysis and Design of Multivariable Feedback Control Systems*, Control3D, LLC, ISBN: 1-932451-50-1, 2nd edition, 980 pp., 1 interactive DVD (700 additional pp.), 2004.
180. **A.A. Rodriguez**, *Linear Systems: Analysis and Design*, Control3D, LLC, ISBN: 1-932451-99-4, 1st edition, 975 pp., 1 interactive DVD (450 additional pp.), 2004.
181. **A.A. Rodriguez**, *Analysis and Design of Feedback Control Systems*, Control3D, LLC, ISBN: 1-932451-00-5, 1st edition, 997 pp., 2 interactive CDs (350 additional pp.), 2003.
182. **A.A. Rodriguez**, *Analysis and Design of Multivariable Feedback Control Systems*, Control3D, LLC, ISBN: 1-932451-50-1, 1st edition, 995 pp., 2 interactive CDs (600 additional pp.), 2003.

- Above texts have been accepted into the *MathWorks Book Program* (2003-2006).
- E-Book versions of the above texts - with interactive *Modeling, Simulation, Animation, and Real-Time Control (MoSART) Software Environments* - are under development. This work is supported, in part, by NSF-CCLI-EMD Grant 0231440 (\$354,310, 2003-2006).

- Academic Partners: Faculty from over 30 universities across the nation have agreed to contribute to the development of the E-Books.
- Industrial Partners include: Boeing, Honeywell, Intel, MathWorks, Microsoft, Motorola, NASA, Raytheon.

### Book Chapters

183. A.A. Rodriguez, “Missile Guidance,” *Encyclopedia of Electrical and Electronics Engineering*, John Wiley & Sons, 2015, 26 pages, Invited Chapter.
184. J. Si, L. Yang, C. Lu, K.S. Tsakalis, and A.A. Rodriguez, “Toward Design of Nonlinear ADP Learning Controllers with Performance Assurance,” *Reinforcement Learning and Approximate Dynamic Programming for Feedback Control*, F.L. Lewis, D. Liu, Published Online, 7 February 2013, Invited Chapter.
185. A.A. Rodriguez, J.J. Dickeson, J.M. Anderies, O. Cifdaloz, “Design of Robust Policies for Uncertain Natural Resource Systems: Application to the Classic Gordon-Schaefer Fishery Model,” *Challenges and Paradigms in Applied Robust Control*, Chapter 19, Editor: A. Bartoszewicz, pp 415–442, 2011, Invited Chapter.
186. A.A. Rodriguez, “Control System Design Via  $\mathcal{H}^2$  Optimization,” *The Mechatronics Handbook: Mechatronic System Control, Logic, and Data Acquisition*, Chapter 10, CRC Press LLC, 2nd Edition, 2008, pp. 10-1–10-48, Invited Chapter.
187. A.A. Rodriguez, “Missile Guidance,” *Encyclopedia of Electrical and Electronics Engineering*, John Wiley & Sons, 2007, 26 pages, Invited Chapter.
188. A.A. Rodriguez, “Missile Guidance,” *Encyclopedia of RF and Microwave Engineering*, Wiley Publishing Company, Vol. 4, 2005, pp. 3082–3095, Invited Chapter. Online version at [www.mrw.interscience.wiley.com](http://www.mrw.interscience.wiley.com)
189. A.A. Rodriguez, “Control System Design Via  $\mathcal{H}^2$  Optimization,” *The Mechatronics Handbook*, Chapter 30, CRC Press LLC, February 2002, pp. 30-1–30-48, Invited Chapter.
190. A.A. Rodriguez, “Missile Guidance,” *Encyclopedia of Electrical and Electronics Engineering*, Wiley Publishing Company, Vol. 13, 1999, pp. 316-325, Invited Chapter.

### Workshop Proceedings: Sponsored by NSF

191. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Ninth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, University of Nevada - Las Vegas, February 24, 2006, 130 pages, Invited Workshop.
192. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Eighth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, University of Utah, September 29, 2005, 130 pages, Invited Workshop.
193. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Seventh MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, Arizona State University, March 29, 2004, 130 pages, Invited Workshop.
194. A.A. Rodriguez (Proceedings Author and Plenary Speaker), “Sixth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, University of Utah, October 30, 2003, 120 pages, Invited Workshop.
195. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Fifth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, Arizona State University, April 1, 2003, 120 pages, Invited Workshop.
196. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Fourth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, University of Utah, September 12, 2002, 118 pages, Invited Workshop.
197. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), “Third MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow’s Leaders,” Workshop Proceedings, Arizona State University, March 27, 2002, 106 pages, Invited Workshop.

198. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), "Second MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of New Mexico, November 9, 2001, 95 pages, Invited Workshop.
199. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), "First MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, Arizona State University, January, 12, 2001, 90 pages, Invited Workshop.

All workshops have been supported by the National Science Foundation. Attendance has ranged from 60-75. Attendees have included: Professor Richard Tapia (National Medal of Science, NSB, National Academy of Engineering, Presidential Excellence Awardee); Dr. Roosevelt Johnson, NSF AGEP Program Director; Dr. Brian L. Foster, Provost, University of New Mexico; Dr. Albert L. McHenry, Dean, ASU College of Technology and Applied Sciences; Dr. Peter E. Crouch, Dean, ASU College of Engineering and Applied Sciences; Dr. Julian M. Earls, Deputy Director, NASA John Glenn Research Center; Presidential Awardees: Professor Charles Thompson (Univ Mass, Lowell) and Professor William Velez (Univ of Arizona).

### **MoSART-FAME Research-Mentoring Program Articles and Publicity**

Since 1994, I have managed a *MoSART-FAME* Research-Mentoring Program that continues to receive national recognition. The program has been supported by the

- National Science Foundation (NSF), Coalition to Increase Minority Degrees (CIMD), Western Alliance to Expand Student Opportunities (WAESO), Minority Graduate Education @ Mountain States Alliance (MGE@MSA), and industry.

Over 400 undergraduate students have participated my *MoSART-FAME* Research-Mentoring Program. Student research projects have been in the following areas:

- **Theoretical Areas.** Dynamic modeling, multivariable control system design, systems with multiple hard nonlinearities, LPV systems, gain scheduling, control of infinite-dimensional/distributed parameter systems, sampled-data/multi-rate control, system identification, real-time control.
- **Application Areas.** Missiles, fixed- and rotary-winged aircraft, hypersonic vehicles, micro air vehicles, jet engines, satellites, CMGs, robots, electromechanical systems, flexible structures, submarines, intelligent vehicles, semiconductor fabs/processes, power electronics, adaptive learning algorithms, embedded systems.

The following are related articles and publicity (over 25) documenting this recognition.

200. Dan McGraw, "Class Act: From Misspent Youth to Missiles," *Engineering, Go For It!* - A New ASEE K-12 Engineering guidebook/magazine (interview and photoshoot: April 2003). September 2003, page 55.
201. David W. Dorman (Chair and CEO of AT&T), AT&T 2001-2002 Corporate Citizenship Report, "Mentors Cultivate Careers," picture of AAR on cover, article and picture on page 16, December, 2002.
202. M. Quan, "In Nod to Mentors, Prof Pays It Forward," *EE Times*, Issue 1243, 11/4/02, pp. 101-102. Contains picture with President Clinton.
203. M. Quan, "Professor's Fame Draws Minority Students to Science, Tech," *EE Times Online*, 10/31/02, <http://www.eetimes.com/story/OEG20021030S0038>, The Work Circuit, *EE Times Network*, <http://www.theworkcircuit.com/story/OEG20021030S0038>, ACM TechNews, <http://www.acm.org/technews/articles/2002-4/1104m.html#item9>
204. D. Cartagena, "*MoSART-FAME* Research Activity at Arizona State University," *First MGE@MSA Graduate Research Conference*, Arizona State University, January 12, 2001.
205. B. Gomez, "Award-Winning Professor Focusses On Mentoring: Rodriguez Revisits White House," *State Press*, October 19, 2000, pp. 6-7.
206. "ASU Presidential Excellence Award Winner Returns To White House," *The Valley Megaphone: IEEE Phoenix Section Newsletter*, Vol. XVII, No. 7, October, 2000, page 1, 5.
207. V. Mohan-Ran, "A Pinch of This, A Dash Of That – Ingredients for Good Mentoring," *Science's Next Wave Magazine*, December, 1999, <http://nextwave.sciencemag.org/cgi/content/full/1999/12/09/14>



208. V. Mohan-Ran, "Mentoring Advice From a Presidential Awardee," *Science's Next Wave Magazine*, December, 1999, <http://nextwave.sciencemag.org/cgi/content/full/1999/12/09/13>
209. V. Mohan-Ran, "Athena in Mentor's Clothing," *Science's Next Wave Magazine*, December, 1999, <http://nextwave.sciencemag.org/cgi/content/full/1999/12/09/15>
210. A.A. Rodriguez, "Career Tracks: Control Systems Engineering," *Careers and the Engineer*, Crimson & Brown Publishers, Vol. 11, No. 1, 1999, page 69.
211. Jannice Arenofsky, "Accepting the Challenge," *Career Opportunities and Insights*, February 1999, pp. 18-20,
212. Michael Gillespie, "Presidential Award," *Cable: Newsletter of Polytechnic University*, Vol. 25, No. 3, Fall, 1998, page 14.
213. "ASU EE Professor Wins Presidential Excellence Award," *The Valley Megaphone: IEEE Phoenix Section Newsletter*, Vol. XV, No. 10, December, 1998, page 1, 4.
214. "ASU Engineering Professor Wins Presidential Award for Excellence," *Full Circle: ASU CEAS News*, Fall, 1998, page 3.
215. Presidential Awards, *ASU News You Need To Know*, October, 1998.
216. Margaret Scott, "Professor Receives Top Honor," *ASU Insight*, Vol. 19, No. 9, September 4, 1998, page 1, 7.
217. Earl Tellex Wilcox, "ASU Professor Is Only Hispanic Winner Of 1998 Presidential Award," *El Sol*, Vol. 1, No. 17, September 24, 1998, page 8.
218. Lawn Griffiths, Friends and Neighbors, *The Tribune*, October 28, 1998.
219. Maureen Groppe, "ASU Engineering Professor Up In Air Over Oval Office Visit," *The Tribune*, Tribune Washington Bureau, September 11, 1998, page A9.
220. Marin Dolan, "Presidential Award," *The Arizona Republic*, September 8, 1998, page 4EV.
221. "Rodriguez Wins Presidential Award," *Hispanic Outlook*, November 20, 1998.
222. Presidential Awards, *Business Journal*, October 2, 1998.
223. Ray Bert, "Presidential Awards Honor Mentors," *ASEE PRISM*, page 10, December 1998.
224. President Clinton: Honoring Mentors of Science and Engineering, <http://clinton4.nara.gov/WH/Work/091098.html>, September 10, 1998.
225. National Science Foundation, Office of Legislative and Public Affairs, <http://www.nsf.gov/od/lpa/news/press/pr9849.htm>, September 10, 1998.
226. The White House, Office of the Press Secretary, "Fact Sheet: Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring," <http://www.pub.whitehouse.gov/uri-res/I2R?urn:pdi://oma.eop.gov.us/1998/9/11/1.text.1>, September 11, 1998. See also the following White House memorandum for the National Science and Technology Council on "Achieving Greater Diversity Throughout the U.S. Scientific and Technical Work Force": <http://www.pub.whitehouse.gov/uri-res/I2R?urn:pdi://oma.eop.gov.us/1998/9/11/2.text.1>, September 10, 1998.
227. The White House, Office of the Press Secretary, "Remarks by the President at Presentation Ceremony for Presidential Awards for Excellence In Science, Mathematics, and Engineering Mentoring," The Roosevelt Room, <http://www.pub.whitehouse.gov/uri-res/I2R?urn:pdi://oma.eop.gov.us/1998/9/10/6.text.1>, September 10, 1998.

### Technical Reports

228. A.A. Rodriguez, "Arizona State University *MoSART-FAME* Research and Mentoring Program," NSF 9814738, Final Report for 1998 White House Presidential Excellence Award, July, 2002, 28 pages.
229. A.A. Rodriguez, "Development of ASU's *MoSART-FAME* Facility," Final Report for NSF-ILI Grant 9851422, July, 2002, 35 pages.

230. A.A. Rodriguez, "Modeling, Simulation, Animation and Real-Time Control (MoSART) of Dynamical Systems," NSF/WAESO Reports, 1997-1998.
231. A.A. Rodriguez, "Modeling, Simulation, and Graphical Visualization of a Molecular Beam Epitaxy Reactor," NSF/CIMD Report Number F95UR051, December, 1995, S96UR060, June, 1996.
232. A.A. Rodriguez, "Modeling, Simulation, and Graphical Visualization of Dynamical Systems: Exothermic Reactor Under Automatic Control," NSF/CIMD Report Numbers V95UR046, June 1995, F94UR040, December 1995, S96UR065, June, 1996.
233. A.A. Rodriguez, "Modeling, Simulation, and Graphical Visualization of Dynamical Systems: High Performance Aircraft, Equipment Scheduling Within A Semiconductor Fabrication Facility," NSF/CIMD Report Numbers SP95UR060, SP95UR062, V95UR041, V95UR051, June 1995, F95UR041, F95UR050, December, 1995, S96UR054, June, 1996.
234. A.A. Rodriguez, "Modeling, Simulation, and Graphical Visualization of Dynamical Systems: Twin Lift Helicopter System Dynamics, Learning the Motion of an Evasive Monkey, Dynamic Resource Allocation, Jet Engine Dynamics," NSF/CIMD Report Numbers SU94UR022-SU94UR025, September, 1994, FA94UR045, FA94UR042, FA94UR024, FA94UR046, December, 1994, SP95UR057, SP95UR058, SP95UR059, SP95UR061, June, 1995, S96UR055, June, 1996.
235. A.A. Rodriguez, "Graphical Visualization of General Spring-Mass-Dashpot (SMD) System for Modal Analysis," NSF/CIMD Report Numbers SP94UR043, SU94UR021, FA94UR044, June, September, December 1994, SP95UR056, June, 1995, F95UR046, December, 1995.
236. A.A. Rodriguez, "Graphical Visualization of a Flexible Inverted Pendulum under Automatic Control," NSF/CIMD Report Numbers SP94UR042, SU94UR020, FA94UR048, June, September, December 1994, SP95UR055, June, 1995, F95UR045, December, 1995.
237. A.A. Rodriguez, "Graphical Visualization of Wave Propagation Along a Damped String with User-Specified Initial Conditions," NSF/CIMD Report Numbers SP94UR041, SU94UR019, FA94UR049, June, September, December 1994, SP95UR054, June, 1995.
238. A.A. Rodriguez, "Graphical Visualization of a Semiconductor Diffusion Process with User-Specified Boundary Conditions," NSF/CIMD Report Numbers SP94UR040, SU94UR018, FA94UR040, June, September, December 1994, SP95UR053, V95UR056, June, 1995, S96UR057, June, 1996.
239. A.A. Rodriguez, "Graphical Visualization of Missile-Target Engagements for the Purpose of Evaluating Missile Guidance and Control Systems," NSF/CIMD Report Numbers SP94UR039, SU94UR017, FA94UR043, June, September, December 1994, SP95UR063, V95UR055, June, 1995, S96UR058, June, 1996.
240. A.A. Rodriguez, "Graphical Tool for Studying the Oscillations which Occur in Controlling the Longitudinal Dynamics of a Platoon of Vehicles," NSF/CIMD Report Numbers SP94UR038, SU94UR016, FA94UR047, June, September, December 1994, SP95UR052, June, 1995.
241. H. Hartana, L. Wong, and A.A. Rodriguez, "Control Systems Analysis and Design for a Platoon of Vehicles: Longitudinal Dynamics with and without Lead Vehicle Information," Report, Department of Electrical Engineering, Center for System Science and Engineering, Arizona State University, January 1994.
242. A.A. Rodriguez, "Development of Control Design Methodologies for Flexible Systems with Multiple Hard Nonlinearities," 1993 SREP Final Report, RIP # 93-195, WL/MNAG, Eglin Air Force Base, FL, December, 1993, pp. 25-1-25-31.
243. A.A. Rodriguez, "Development of Controller Design Methodologies for Infinite-Dimensional Systems," ASU-FGIA Final Report, September 1993.
244. A.A. Rodriguez, "Approximation of Infinite-Dimensional Systems Based on Closed-Loop Performance Criteria," ASU-FGIA Final Report, January 1992.
245. A.A. Rodriguez, "A Methodology for Missile Autopilot Performance Enhancement in the Presence of Multiple Hard Nonlinearities," AFOSR SFRP Report, WL/MNAG, Eglin Air Force Base, FL, September, 1993, pp. 48-1-48-19.
246. A.A. Rodriguez, "Development of Control Design Methodologies for Flexible (High Order) Missile Systems with Multiple Hard Nonlinearities," AFOSR SFRP Report, WL/MNAG, Eglin Air Force Base, FL, September, 1992, pp. 47-1-47-20.

247. D. Schmidt, A.A. Rodriguez, et. al. "Research in Flight and Structural Mode Control," Aerospace Research Center Report Number ARC-102, Submitted to Honeywell Commercial Flight Systems, November 1990.
248. A. A. Rodriguez, *Control of Infinite-Dimensional Systems using Finite-Dimensional Techniques: A Systematic Approach*, PhD dissertation, Massachusetts Institute of Technology, Department of Electrical Engineering and Computer Science, June 1990, Cambridge, MA.
249. A.A. Rodriguez and M.A. Dahleh, "A Finite-Dimensional Approach to Infinite-Dimensional Multiblock  $\mathcal{H}^\infty$  Optimal Control Problems," Massachusetts Institute of Technology, LIDS Technical Report No. P-1950, February 1990.
250. A.A. Rodriguez, P. Kamasouris, and M. Athans, "On the Relationship between Transmission Zeroes, Controllability, Observability, Generalized Eigenvalue Problems, and Pole-Zero Cancellations," Massachusetts Institute of Technology, 6.233J course notes, January 1988.
251. A.A. Rodriguez, "Design of an Automatic Flight Control System for a Multi-Input Multi-Output Nonsquare Missile System," Raytheon proprietary report, September 1987.
252. A.A. Rodriguez, *Multivariable Control of a Twin Lift Helicopter System using the LQG/LTR Design Methodology*, Master's Thesis, Massachusetts Institute of Technology, Department of Electrical Engineering and Computer Science, June 1987.
253. A.A. Rodriguez, "Search Engine Implementation Constraints on the S/NET-SPS System," AT&T Bell Laboratories proprietary report, August 1983.
254. A.A. Rodriguez, "Design of a Multi-environment Testbench to Qualify INMOS 16K $\times$ 1 SRAM's using the Teradyne J387-A Memory Tester," IBM report, August 1982.

### Invited Publications

Over 70 invited publications in the following areas:

- robust multivariable control system design, missile guidance and control, engineering education, adaptive algorithms, *Modeling, Simulation, Animation, and Real-Time Control (MoSART)*, modeling and control of social-economic renewable resource systems, control of semiconductor facilities, control of distributed parameter systems, sampled data control system design, embedded systems, rapid prototyping, fixed- and rotary-winged aircraft control, control of electromechanical systems, robot control, and *Flexible Autonomous Machines operating in an Uncertain Environment (FAME)*.

The following list of papers is a subset of those listed in previous sections.

1. J. Si, L. Yang, C. Lu, K.S. Tsakalis, and A.A. Rodriguez, "Toward Design of Nonlinear ADP Learning Controllers with Performance Assurance," *Reinforcement Learning and Approximate Dynamic Programming for Feedback Control*, F.L. Lewis, D. Liu, Published Online, 7 February 2013, Invited Chapter.
2. A.A. Rodriguez, J.J. Dickeson, J.M. Anderies, O. Cifdaloz, "Design of Robust Policies for Uncertain Natural Resource Systems: Application to the Classic Gordon-Schaefer Fishery Model," *Challenges and Paradigms in Applied Robust Control*, Chapter 19, Editor: A. Bartoszewicz, pp 415-442, 2011, Invited Chapter.
3. A.A. Rodriguez, J. J. Dickeson, S. Sridharan, A. Korad, J. Khatri, J. Benavides, D. Soloway, and A. Kelkar, and J.M. Vogel, "Control-Relevant Modeling, Analysis, and Design for Scramjet-Powered Hypersonic Vehicles," pp. 1 - 45, *16<sup>th</sup> AIAA/DLR/DGLR International Space Planes and Hypersonic Systems and Technologies Conference*, 2009. Invited Paper.
4. A.A. Rodriguez, "Control System Design Via  $\mathcal{H}^2$  Optimization," *The Mechatronics Handbook: Mechatronic System Control, Logic, and Data Acquisition*, Chapter 10, CRC Press LLC, 2nd Edition, 2008, pp. 10-1-10-48, Invited Chapter.
5. M. Anderies, A.A. Rodriguez, M. Janssen, and O. Cifdaloz, "Panaceas, Uncertainty, and the Robust Control Framework in Sustainability Science," *Proceedings of the National Academy of Science*, September 25, 2007, 104(39) pp. 15194-15199. Special Issue: *Beyond Panaceas: Crafting Diverse Institutional Arrangements for Governing Diverse Social-Ecological Systems*, Editor: Dr. Elinor Ostrom (2009 Nobel Laureate in Economic Sciences). Review Workshop on January 8-10, 2007.

6. O. Cifdaloz, A.A. Rodriguez, R. McCullen, J.J. Dickeson, " $\mathcal{H}^\infty$  Mixed-Sensitivity Optimization for Distributed Parameter Plants Subject to Convex Constraints," *Proceedings of the 46<sup>th</sup> IEEE Conference on Decision and Control*, December 10–11, 2007, New Orleans, LA, pp. 866–871. Invited paper.
7. A.A. Rodriguez, "Missile Guidance," *Encyclopedia of Electrical and Electronics Engineering*, Wiley Publishing Company, 2007, 26 pages, Invited Chapter.
8. O. Cifdaloz, A.A. Rodriguez, "Constrained  $\mathcal{H}^\infty$  Mixed-Sensitivity Optimization for Stable Infinite-Dimensional Plants," *Proceedings of the 17<sup>th</sup> International Symposium on Mathematical Theory of Networks and Systems*, July 24–28, 2006, Kyoto, Japan, pp. 2363–2371, Invited.
9. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), "Ninth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of Nevada - Las Vegas, February 24, 2006, 130 pages, Invited Workshop.
10. A.A. Rodriguez, "Missile Guidance," *Encyclopedia of RF and Microwave Engineering*, Wiley Publishing Company, Vol. 4, 2005, pp. 3082–3095, Invited Chapter. Online version at [www.mrw.interscience.wiley.com](http://www.mrw.interscience.wiley.com)
11. A.A. Rodriguez (Proceedings Author, Moderator, and Plenary Speaker), "Eighth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of Utah, September 29, 2005, 130 pages, Invited Workshop.
12. Y. Lei, J. Si, K.S. Tsakalis, and A.A. Rodriguez, "Understanding Direct NDP with Linear Quadratic Regulation," *Proceedings of the 19th IEEE International Symposium on Intelligent Control (ISIC)*, Taipei, Taiwan, Sept. 2–4, 2004, pp. 374–379, Invited Paper.
13. A.A. Rodriguez (Workshop Proceedings Author and Plenary Speaker), "Seventh MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, Arizona State University, March 29, 2004, 130 pages, Invited Workshop.
14. Y. Lei, J. Si, K.S. Tsakalis, and A.A. Rodriguez, "Analyzing and Enhancing Direct NDP Designs using a Control-Theoretic Approach," *Proceedings of the 18th IEEE International Symposium on Intelligent Control*, Houston, TX, October 5-8, 2003, Invited Paper, pp. 529–532.
15. A.A. Rodriguez (Proceedings Author and Plenary Speaker), "Sixth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of Utah, October 30, 2003, 120 pages, Invited Workshop.
16. A.A. Rodriguez (Workshop Proceedings Author and Plenary Speaker), "Fifth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, Arizona State University, April 1, 2003, 120 pages, Invited Workshop.
17. A.A. Rodriguez, "Control System Design Via  $\mathcal{H}^2$  Optimization," *The Mechatronics Handbook*, Chapter 30, CRC Press LLC, February 2002, pp. 30-1–30-48, Invited Chapter.
18. A.A. Rodriguez (Workshop Proceedings Author and Plenary Speaker), "Fourth MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of Utah, September 12, 2002, 118 pages, Invited Workshop.
19. A.A. Rodriguez (Workshop Co-Organizer, Proceedings Author, and Plenary Speaker), "Third MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, Arizona State University, March 27, 2002, 106 pages, Invited Workshop.
20. A.A. Rodriguez (Workshop Proceedings Author and Plenary Speaker), "Second MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, University of New Mexico, November 9, 2001, 95 pages, Invited Workshop.
21. A.A. Rodriguez (Workshop Co-Organizer, Proceedings Author, and Plenary Speaker), "First MGE@MSA Doctoral Mentoring Institute: Increasing Ph.D. Production and Shaping Tomorrow's Leaders," Workshop Proceedings, Arizona State University, January, 12, 2001, 90 pages, Invited Workshop.
22. A.A. Rodriguez, "*MoSART-FAME* at Arizona State University (ASU): Curricular Reform and Innovation In Controls," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8–10, 2001, pp. 60-65, Invited Paper.
23. J.S. Koenig, W. Sharp, K.M. Linda, V. Wells, R.P. Metzger, Jr. and A.A. Rodriguez, "Development Of A Rotorcraft Modeling, Simulation, Animation, And Real-Time Control (*MoSART*) Environment," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8–10, 2001, pp. 66-71, Invited Paper.

24. C. Hornberg, A. Pitts, J. DeFalco, B. Preble, E. Olivanti, J.S. Koenig, R.P. Metzger, Jr. and A.A. Rodriguez, "Modeling, Simulation, And Control of a Mobile Robotic Testbed for Research in the Area of FAME," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8-10, 2001, pp. 72-77, Invited Paper.
25. R.P. Metzger, Jr. and A.A. Rodriguez, "Development of an Interactive Modeling, Simulation, Animation, and Real-Time Control (MoSART) PUMA Robotic Manipulator Environment," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8-10, 2001, pp. 78-83, Invited Paper.
26. R.P. Metzger, Jr. and A.A. Rodriguez, "Interactive Modeling, Simulation, Animation, and Real-Time Control (MoSART) Robotic Pointing Device Prototyping Environment," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8-10, 2001, pp. 84-89, Invited Paper.
27. R.P. Metzger, Jr. and A.A. Rodriguez, "Modeling, Simulation, Animation, and Real-Time Control (MoSART) of Flexible Inverted Pendulum Systems," *Proceedings of the 2001 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 8-10, 2001, pp. 90-95, Invited Paper.
28. A.A. Rodriguez, "MoSART-FAME Research Problems and Program," *NSF-CMS Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators (WEEs)*, October 22-24, 2001, Washington, D.C., pp. 80-82.
29. A.A. Rodriguez, "MoSART-FAME at Arizona State University (ASU): Curricular Reform and Innovation In Controls," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 9-18, Invited Session.
30. R.P. Metzger and A.A. Rodriguez, "Development of Interactive MoSART Pendulum Environments," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 19-26, Invited Session.
31. R.P. Metzger and A.A. Rodriguez, "Interactive MoSART Robotic Pointing Device Environment," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 27-34, Invited Session.
32. R.P. Metzger and A.A. Rodriguez, "Development of an Interactive MoSART PUMA Robotic Manipulator Environment," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 35-44, Invited Session.
33. C. Hornberg, A. Pitts, J. DeFalco, B. Preble, E. Olivanti, C.I. Lim, R.P. Metzger, and A.A. Rodriguez, "Toward the Development of a Test Bed for Research in the Area of Flexible Autonomous Machines operating in an uncertain Environment (FAME)," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 45-54, Invited Session.
34. J. Koenig, R.P. Metzger, K. Linda, A.A. Rodriguez, and V. Wells, "An Interactive MoSART Environment for Rotorcraft Control System Design," *Proceedings of the ASEE/PSW Conference*, Tucson, AZ, April 14-15, 2000, pp. 55-64, Invited Session.
35. A.A. Rodriguez, T.Y. Kim, R.P. Metzger, and C.I. Lim, "MoSART: A Unifying Theme For The Development Of Advanced Interactive Research And Education Tools," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 175-180, Invited Session.
36. R.P. Metzger, C.I. Lim, and A.A. Rodriguez, "On The Development Of Interactive MoSART Environments: The Microsoft Software Suite," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 181-186, Invited Session.
37. S.S. Kwak, C.I. Lim, R.P. Metzger, and A.A. Rodriguez, "Development Of An Interactive MoSART Submarine System Environment," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 187-192, Invited Session.
38. C.I. Lim and A.A. Rodriguez, "Development Of An Interactive MoSART Twin Lift Helicopter System (TLHS) Environment," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 193-198, Invited Session.
39. R.P. Metzger, Chen-l Lim, and A.A. Rodriguez, "Development Of An Interactive MoSART Multiple Pendulum Environment," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 199-204, Invited Session.
40. C. Rios, R.P. Metzger, and A.A. Rodriguez, "Development Of An Interactive MoSART Cart-Pendulum-Seesaw Environment," *Proceedings of the 1999 ICSEE*, San Francisco, CA, January 17-20, 1999, pp. 205-210, Invited Session.

41. R.P. Metzger, C.I. Lim, and A.A. Rodriguez, "On the Development Of Interactive *MoSART* Environments," *Proceedings of the 1999 ASEE/PSW Conference*, Las Vegas, NV, March 19-20, 1999, pp. 157-162, Invited Session.
42. R.P. Metzger, C. Rios, J. Hernandez, and A.A. Rodriguez, "Interactive *MoSART* Pendulum Environments," *Proceedings of the 1999 ASEE/PSW Conference*, Las Vegas, NV, March 19-20, 1999, pp. 163-172, Invited Session.
43. R.P. Metzger and A.A. Rodriguez, "An Interactive *MoSART* Robotic Manipulator Environment," *Proceedings of the 1999 ASEE/PSW Conference*, Las Vegas, NV, March 19-20, 1999, pp. 173-182, Invited Session.
44. C.I. Lim, T.Y. Kim, S.S. Kwak, R.P. Metzger, and A.A. Rodriguez, "Interactive Modeling, Simulation, Animation and Real-Time Control (*MoSART*) Vehicle-Based Environments," *Proceedings of the 1999 ASEE/PSW Conference*, Las Vegas, NV, March 19-20, 1999, pp. 183-192, Invited Session.
45. J. Koenig and A.A. Rodriguez "Development of An Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Tilt Wing Rotorcraft Environment and Testbed,"  
Presented and Distributed at *IEEE Southwest Regional Conference*, San Diego, CA, April, 1999, 22 pages, Best Paper Award.
46. A. Sanchez and A.A. Rodriguez, "*MoSART-FAME* Research at Arizona State University (ASU)," *Bell Labs Research, Science, and Technology Exchange Forum*, August 2-3, 1999, Murray Hill, New Jersey, 15 pages, Invited Paper.
47. A.A. Rodriguez, "Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) of Flexible Autonomous Machines operating in an uncertain Environment (*FAME*)," *NSF-CMS-BES Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators (WEEs)*, September 27-29, 1999, Washington, D.C., pp. 62-63, Invited.
48. D.R. Carter and A.A. Rodriguez, "Weighted  $\mathcal{H}^\infty$  Mixed-Sensitivity Minimization for Distributed Parameter Plants Under Sampled Data Control," *Theory and Practice of Control and Systems: Proceedings of the 6<sup>th</sup> IEEE Mediterranean Conference*, Editors: A. Tornambe, G. Conte, A.M. Perdon, World Scientific, Alghero, Sardinia, Italy, June 9-11, 1998, pp. 714-719, Invited Paper.
49. C.I. Lim and A.A. Rodriguez "An Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Helicopter Environment," Presented and Distributed at *IEEE Southwest Regional Conference*, Albuquerque, NM, April, 1998, 20 pages, Best Paper Award.
50. C.I. Lim and A.A. Rodriguez, "An Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Helicopter Environment: A Tool For Enhancing Research and Education," *Proceedings of the WESCON 98 IEEE Conference*, Anaheim, CA, September, 1998, pp. 327-347, Best Paper Award.
51. A.A. Rodriguez and C. Lim, "Interactive Environment for Teaching Systems and Controls: The Need for Educational Tools," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 9-14, Invited Paper.
52. M. Roberts, M.F. DeHerrera, and A.A. Rodriguez, "The Evasive Monkey: An Environment for Evaluating Adaptive Learning Algorithms," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 51-56, Invited Paper.
53. M.F. DeHerrera, A.A. Rodriguez, R. Metzger, and D. Cartagena, "Modeling, Simulation, and Graphical Visualization of a Liquid Level Control System," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 57-62, Invited Paper.
54. M.F. DeHerrera and A.A. Rodriguez, "Teaching Systems and Controls Using a MATLAB-Based Interactive Environment," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 71-76, Invited Paper.
55. R. Metzger and A.A. Rodriguez, "Modeling, Simulation, Animation, and Control for a Single Robotic Manipulator," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 77-82, Invited Paper.
56. R. Metzger, A.A. Rodriguez, R. Aguilar, and C. Lim, "Teaching Control System Design Concepts Using A Virtual Inverted Pendulum Environment," *Proceedings of the 1997 International Conference on Simulation in Engineering Education*, Phoenix, AZ, January 12-15, 1997, pp. 134-139, Invited Paper.

57. M.K. ElAdl, J. Flores, M. Kowski, A.A. Rodriguez, and K.S. Tsakalis, "Modeling and Control of Re-entrant Semiconductor Fabrication Lines: A Hierarchical Approach," presented at the *American Control Conference*, Albuquerque, NM, June, 1997, Invited Paper.
58. K.S. Tsakalis, J. Flores, and A.A. Rodriguez, "Hierarchical Modeling and Control of Re-entrant Semiconductor Fabrication Lines: A Mini-Fab Benchmark," *Proceedings of the 6<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation*, UCLA, Los Angeles, CA, September 9-12, 1997, pp. 508-513, Invited Paper.
59. A.A. Rodriguez, "Robust Control of Multivariable Nonlinear Dynamical Systems," NSF Civil and Mechanical Systems Workshop, A Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators, September 24-26, Arlington, VA., 1997 pp. 36-37, Invited.
60. M.F. DeHerrera and A.A. Rodriguez, "The Evasive Monkey: Design and Evaluation of Adaptive Algorithms," presented at the *1996 MAES National Symposium and Career Fair*, Lake Buena Vista, FL, January 10-13, 1996, Invited
61. C. Corzo, M.F. DeHerrera, and A.A. Rodriguez, "Missile Target Engagements: A Tool for Evaluating Missile Autopilots," presented at the *1996 MAES National Symposium and Career Fair*, Lake Buena Vista, FL, January 10-13, 1996, Invited.
62. R. Aguilar, M.F. DeHerrera, and A.A. Rodriguez, "Graphical Visualization of an Inverted Pendulum Under Automatic Control," presented at the *1996 MAES National Symposium and Career Fair*, Lake Buena Vista, FL, January 10-13, 1996, Invited.
63. R.H. Bishop, S.P. Castillo, R.K. Kapania, R. Logendran, T.N. Mouch, J.H. Oliver, D.A. Pacey, A.A. Rodriguez, O. Savas, V.L. Syrmos, R.R. Talreja, "Engineering Education: A Vision For Change," *1996 World Aviation Congress*, October 21-24, 1996, Los Angeles, CA, AIAA Paper No. 965543, Invited Paper.
64. R. Aguilar and A.A. Rodriguez, "Graphical Visualization of Missile-Target Air-to-Air Engagements: A Tool for Designing and Evaluating Missile Guidance and Control Systems," presented at the *3<sup>rd</sup> NSF National Conference on Diversity in the Scientific and Technological Workforce*, October 1994, Invited.
65. A.A. Rodriguez and Y. Wang, "Saturation Prevention Strategies for Unstable Bank-to-Turn (BTT) Missiles: Partial Information," *Proceedings of the American Control Conference*, Seattle, WA, June 21-23, 1995, pp. 2143-2147, Invited Paper.
66. M.F. DeHerrera and A.A. Rodriguez, "Trying to "Shoot" an Evasive Monkey: A Testbed for Adaptive Algorithms," presented at the *1995 AMP Research Conference*, University of California at Irvine, July 30-August 1, 1995, Invited.
67. A.A. Rodriguez and J.R. Cloutier, "Control of a Bank-to-Turn Missile with Multiple Saturating Actuators," *Proceedings of the American Control Conference*, Baltimore, MD, June 29-July 1, 1994, pp. 1660-1664, Invited Paper.
68. A.A. Rodriguez and S.N. Balakrishnan, "Missile Guidance and Control in the Presence of Actuator/Control Saturation," Distributed at the *1994 AIAA Guidance, Navigation, and Control Conference*, Scottsdale, AZ, August 1, 1994, (18 pages), Invited Paper.
69. A.A. Rodriguez and Y. Wang, "Saturation Prevention Strategies for an Unstable Bank-to-Turn (BTT) Missile: Full Information," *13th IFAC Symposium: Automatic Control in Aerospace Engineering - Aerospace Control '94*, Palo Alto, Editors: D.B. Schaechter and K.R. Lorell, CA, September 12-16, 1994, pp. 149-154, Invited Paper.
70. A.A. Rodriguez and M. Athans, "Multivariable Control of a Twin Lift Helicopter System using the LQG/LTR Design Methodology," *Proceedings of the American Control Conference*, Seattle, WA, June 18-20 1986, pp. 1325-1332, Invited Paper.

## 2 Additional Collaborative Research

In an effort to expand research opportunities for my graduate students, I have initiated/pursued various research collaborations. These are described below.

### Research Collaboration with Global Institute for Sustainability

Since 2005, I have collaborated with Professor John M. Anderies (School of Human Evolution and Social Change, Global Institute for Sustainability). During 2005, we put together a successful NSF-HSD proposal (\$750K, 2005-2009):

- Co-PI: A.A. Rodriguez, "HSD: Integrated Analysis of Robustness in Dynamic Social Ecological Systems," NSF-BCS, Award #0527744, 9/1/2005-2/28/2009, total funding: \$749,278, (PI: J.M. Anderies, Co-PIs: A. Kinzig, M. Janssen, C. Perrings).

to examine robustness properties within socio-ecological systems as well to develop robust resource management strategies. Several journal papers are in preparation.

### High Speed Tiltwing Rotorcraft Research Collaboration

Since 1998, I have collaborated with ASU MAE Professor Valana Wells on the development of a full envelope gain scheduled control system for a High Speed Tiltwing Rotorcraft that was built. This effort has resulted in several papers and proposals. This effort is currently benefiting from the following collaborations.

### Intelligent Systems Research Collaboration

Since 2002, I have collaborated with ASU EE Professors Jennie Si and Kostas Tsakalis on learning via neurodynamic programming (NDP). The focus of the work to date has been on understanding NDP, its properties, and how to turn it into a systematic learning/control system design methodology with desirable closed loop properties. Specific emphasis has been placed on steering, via reinforcement learning, the weightings of an action-critic pair towards policies-cost functions associated with designs with desirable properties (e.g. LQR-like stability robustness). This effort resulted in the submission and funding of the following research proposal:

- J. Si, K. Tsakalis, A.A. Rodriguez, "A Control-Theoretic Approach to Approximate Dynamic Programming (ADP) with Applications to Complex Control Problems Involving Human-Machine Interfaces," National Science Foundation, submitted October 2003, \$190K, 5/1/2004-4/30/2007.

The collaboration has resulted in two papers: 1 conference papers, 1 journal paper (under review, IEEE Transactions on Neural Networks). It has also resulted in 3 CEINT proposals - 1 for research, 2 for curriculum development.

### Low Power Electronics

Since 2003, I have collaborated with ASU EE Professor David Allee on the development of digitally compensated low power high frequency DC-DC power converters. Such devices are found in a variety of applications (e.g. personal computers, cell phones, automotive, consumer electronics). A 325 page manuscript has been prepared. A journal paper has appeared. Another journal paper is in preparation for submission to the *IEEE Transactions on Power Electronics*. A low cost DC-DC converter invention filing was placed in 2004. An NSF-CCLI-EMD proposal was funded in 2005 (\$75K, 2005-2007):

- PI: A.A. Rodriguez, "Rapid Prototyping for Embedded System Applications Via High Level Development Tools," NSF-CCLI-EMD, Award #0443133, 5/1/2005-4/30/2007, total funding: \$75K, (Co-PIs: K. Tsakalis, D. Allee, J. Si).

### Research Collaboration with CFA/ISA: Exhibits and Performances

Since 1998, I have participated in a multidisciplinary collaboration between the College of Engineering and Applied Science (CEAS), the College of Fine Arts (CFA), and the Institute for Studies in the Arts (ISA).

- The collaboration brings together faculty and graduate students from CEAS, CFA, and ISA, in an effort to develop new technologies that will enhance artistic exhibitions and performances.

I have supervised student hardware/software/algorithm projects (supported by Dean and EE) which were an essential component of each of the exhibitions and performances listed below. The collaboration recently resulted in an NSF IGERT proposal that was recently funded:



- Co-PI: A.A. Rodriguez, "IGERT: An Arts, Sciences and Engineering Research and Education Initiative for Experiential Media," NSF-DGE, Award #0504647, 11/1/2005-9/30/2006, total funding: \$646,578, (PI: T. Rikakis, Co-PIs: A. Spanias, W. Savenye, J.P. He, H. Sundaram, et. al.).

A new PhD *Artistic, Media, and Engineering (AME)* degree program has been created to support the collaboration.

1. A. Kidane, Jeff McMahon, O. Cifdaloz, V. Harikrishnan, R. Mason, T. Rikakis, S. Britton, and A.A. Rodriguez, "Development of a Floor Sensor Array for Motion Prediction," exhibited at *ASU Drama City* May 2003.  
This involved the development of a 3' × 3' array consisting of 256 (16 × 16) resistive pressure sensors. This prototype will be used as the basis for scaling up to a useful 30' × 30' array that will be used during performances for tracking performers and for real-time decision making.
  - A \$15K research grant was recently obtained from ASU for this project. To be expended during 2003-2004 academic year.
  - Support for one doctoral student has also been provided.
2. J. Benard, G. Mihaleva, J. Tsukayama, G. Valentine, C. Kazilek, A. Kidane, O. Cifdaloz, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Paper Interiors," exhibited at *ASU Drama City*, March 14-15, 2002.  
This involved the development of a control law based on an approximate model for a nonlinear pan-tilt mechanism. A Visual Basic Interface was designed. Assembly code was generated. A printed circuit board (Using Protel) was also developed for a 24V dc motor driving a pan-tilt mechanism similar to that designed by R. Metzger and A.A. Rodriguez.
3. E. Kac, A. Kidane, O. Cifdaloz, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "The Eight Day," exhibited at *ASU Computing Commons Gallery*, October 25–November 2, 2001.  
Developed a panning camera system that would respond to audience-provided coordinates. This involved the development of a Visual Basic Interface as well as the design of a printed circuit board (using Protel) for a 24V dc motor driving a pan mechanism. Project web site: isa.hc.asu.edu
4. A. Kidane, O. Cifdaloz, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Control of ARVID: Video Inclusion in Live Performances," 2000-2001.  
This project involved the control of an *Autonomous Remote Video Imaging Device (ARVID)*. ARVID provides programmable and controlled movement of a video image through a 3D performance space - thus permitting the inclusion of video in a live performance.
5. D. Collins, Jewell P. Rhodes (Playwright), R. Metzger, J. Osborne, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Voodoo Dreams," Theatrical Performance, *ASU Drama City*, February 23-24, 2000.  
This involved the development of a random number (date display) generator driving 8 large 7-segment LED displays.
6. C. Erickson, K. Phillips, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Mnemonic Devices: An Interactive Video Pendulum," *ASU Computing Commons Gallery*, exhibited September 7 – October 26, 2000.  
Involved design, modeling, virtual/hardware prototyping - including integration of electronic components, construction, and real-time (closed loop) control of the pendulum.
7. C. Erickson, K. Phillips, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Mnemonic Devices: An Interactive Video Seesaw," *ASU Computing Commons Gallery*, exhibited September 7 – October 26, 2000.  
Involved design, modeling, virtual/hardware prototyping - including integration of electronic components, construction, and real-time control of a laser disc player.
8. L Hill, H. Paris, J. Lawler, C. Molly, K. Phillips, D. Lorig, R. Metzger, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Bull," Performance, *Downtown Phoenix Gallery*, March 26, 2000.  
A collaborative performance involving: *Desperate Optimists*, LAP, ASU College of Fine Arts' Institute for Studies in the Arts (ISA), and the College of Engineering and Applied Sciences (CEAS). Involved the design, modeling, virtual prototyping, construction, and real-time (open loop) control of a large mechanical bull.
9. R. Kuivila, K. Phillips, R. Metzger, R. Lovell, G. Pawl, R. Loveless, S. Britton, and A.A. Rodriguez, "Locus of Focus," *ASU Computing Commons Gallery*, September 9–October 21, 1999.  
A joint collaboration between the ASU College of Fine Arts' Institute for Studies in the Arts (ISA) and the College of Engineering and Applied Sciences (CEAS). Also exhibited in a Berlin, Germany Art Gallery - May 2000. An array of 24, two-degree-of-freedom, robotic pointers collectively point toward individuals entering the exhibit space and interacting with the array. Involved design, modeling, virtual/hardware prototyping - including integration of electronic components, construction, and real-time (closed loop) control of each device in the array.

10. S. Riskin, D. Lorig, K. Phillips, R. Lovell, G. Pawl, R. Loveless, S. Britton, R. Metzger, and A.A. Rodriguez, "Light Dance," Dance Performance, *International Dance and Art Technology Conference*, February 25-28, 1999.  
Dance performance exploiting reflective mirrors, low-power lasers, and neon lights on the performer's body.
11. L. Hill, H. Paris, D. Lorig, K. Phillips, R. Lovell, G. Pawl, R. Loveless, S. Britton, R. Metzger, and A.A. Rodriguez, "Random Acts of Memory," exhibited at *ASU Drama City*, November 5-6-7 & 12-13-14, 1998  
A synchronous interplay of unreasonable facsimilies and unfaithful self portraits rendered via circuits and synapses. Involved the use of ARVID - an *Autonomous Remote Video Imaging Device*. ARVID provides programmable and controlled movement of a video image through a 3D performance space - thus permitting the inclusion of video in a live performance.

### 3 Invited Seminars and Panels

Over 100 invited seminars - including over 15 plenary seminars.

#### Plenary Seminars and Panels

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|-----------------|---|
| October, 2010   | <i>MGE@MSA Southwest Regional Doctoral Mentoring Institute</i> , "Engineering Grand Challenges and Doctoral Mentoring: Meeting Our National STEM Workforce Needs," University of Utah, Oct 28, 2010, <u>Plenary Speaker</u> . |
| February, 2006  | <i>Ninth MGE@MSA Mentoring Institute</i> , Las Vegas, NV.<br>"The Need for Doctoral Mentors," <u>Plenary Speaker</u> .  |
| September, 2005 | <i>Eighth MGE@MSA Mentoring Institute</i> , Salt Lake City, UT.<br>"The Need for Doctoral Mentors," <u>Plenary Speaker</u> .  |
| March, 2004     | <i>Seventh MGE@MSA Mentoring Institute</i> , Tempe, AZ.<br>"The Need for Doctoral Mentors," <u>Plenary Speaker</u> .  |
| March, 2004     | <i>MGE@MSA Graduate Student Research Conference</i> , Tempe, AZ.<br>"The PhD and the Professoriate," <u>Plenary Speaker</u> .   |
| October, 2003   | <i>Richard Tapia Celebration of Diversity in Computing Conference</i> , Atlanta, GA.<br>"Professional Development for Early Career Scientists," <u>Plenary Panelist</u> .   |
| October, 2003   | <i>Sixth MGE@MSA Mentoring Institute</i> , Salt Lake City, UT.<br>"The Need for Doctoral Mentors," <u>Plenary Speaker</u> .   |
| March, 2003     | <i>NSF-HRD Joint Annual Meeting</i> , Arlington, VA.<br>"The Integration of Research, Teaching, Service, and Mentoring," <u>Plenary Panelist</u> .  |
| October, 2002   | <i>Building a Network of Leaders in SMET</i> , Washington, D.C.<br>"Pursuing a Dream: The Importance of Mentoring," <u>Plenary Speaker</u> .  |
| September, 2002 | <i>Fourth MGE@MSA Mentoring Institute</i> , Salt Lake City, Utah.<br>"Doctoral Mentoring: Making a Difference," <u>Plenary Speaker</u> .  |
| November, 2001  | <i>Second MGE@MSA Mentoring Institute</i> , Albuquerque, NM.<br>"Doctoral Mentoring: Economic and National Security Implications," <u>Plenary Speaker</u> .   |
| September, 2001 | <i>Engaging Students with Diverse Ways of Learning</i> , Tempe, AZ.<br>"Education in the New Millennium: Students, Teachers, Technology, and Diversity," <u>Plenary Speaker</u> .   |
| September, 2000 | <i>White House Presidential Excellence SME Awards</i> , Washington, DC.<br>"Leveraging Your Presidential Excellence Award." An address to the year 2000 White House Presidential Award recipients, <u>Plenary Speaker</u> .   |

- August, 1999 *Bell Labs Research, Science, and Technology Exchange Forum*, Murray Hill, N.J.  
 “MoSART-FAME Research at Arizona State University (ASU),” Plenary Speaker.
- September, 1998 *White House Presidential Excellence Awards Symposium*, Washington D.C..  
 “MoSART-FAME: Multidisciplinary Themes for Mentoring of Science, Mathematics, and Engineering Students,” Plenary Speaker.
- October, 1992 *AT&T Bell Laboratories*, Murray Hill, New Jersey.  
 “Control Challenges in the 21st Century: Distributed Parameter & Large Scale Systems,” Plenary Speaker.

### Other Invited Seminars

- March 1, 2016 *Challenging and Exciting Engineering Career Opportunities: Participating in the Ongoing Technological Revolution*, AT&T, Mesa, AZ.
- November 20, 2015 *Getting Involved in Engineering Research and Preparing for Challenging Engineering Career Opportunities: Advice for CC Transfer Students*, ASU, Tempe, AZ.
- November 4, 2015 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Engineering Research and Preparing for Challenging Engineering Career Opportunities*, Cochise CC.
- October 1-2, 2015 *Exciting Engineering Research and Career Opportunities: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.
- August 19, 2015 *Exciting Research Opportunities in Systems and Controls: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.
- August 15, 2015 *Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, ASU, Transfer Students and Family Welcome, Tempe, AZ.
- April 22, 2015 *Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, Central Arizona College.
- April 17, 2015 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.
- April 1, 2015 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, Mohave Community College.
- March 18, 2015 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, Arizona Western College.
- February 27, 2015 *Challenging and Exciting Engineering Career Opportunities: Participating in the Ongoing Technological Revolution*, AT&T, Mesa, AZ.
- February 11, 2015 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, Eastern Arizona College.
- November 21, 2014 *Getting Involved in Engineering Research and Preparing for Challenging Engineering Career Opportunities: Advice for CC Transfer Students*, ASU, Tempe, AZ.
- November 21, 2014 *The Age of Intelligent Systems is Upon Us: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.
- November 5, 2014 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Engineering Research and Preparing for Challenging Engineering Career Opportunities*, Cochise CC.

October 16, 2014 *Exciting Research and Career Opportunities in Controls*, ASU, Tempe, AZ.

October 8, 2014 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, Arizona Western College.

September 11-12, 2014 *Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.

April 11, 2014 *Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution - Advice to CC Transfers*, ASU, Tempe, AZ.

April 4, 2014 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.

March 6-7, 2014 *Research and Career Opportunities in Engineering: Participating in the Ongoing Technological Revolution*, ASU, Tempe, AZ.

February 19, 2014 *Toward an Arizona-Wide Engineering Transfer Excellence Academy - Engineering Research and Preparing for Challenging Engineering Career Opportunities*, Cochise CC.

February 5, 2014 *Academic Success and Professional Development Best Practices within the ASU Fulton Schools of Engineering*, 12th Annual NISTS Conference, Workshop.

November 22, 2013 *Getting Involved in Engineering Research and Preparing for Challenging Engineering Career Opportunities: Advice for CC Transfer Students*, ASU, Tempe, AZ.

March 15, 2013 *NSF STEP Grantees Meeting*, Washington, DC. "How Can We Help Improve the Retention, Transfer, and Successful Graduation of Engineering and Computer Science Students." (90 minute presentation, co-presenters: M. Anderson-Rowland, R. Hall, P. McBride, and R. Pangasa)

January 31, 2013 *11th Annual Conference of the National Institute for the Study of Transfer Students*, Frisco, TX. "Academic Success and Professional Development for STEM CC Transfer Students: Recruitment to Graduation to Graduate School." (90 minute presentation, co-presenter: M. Anderson-Rowland)

November 9, 2012 *AAC&U Next Generation STEM Learning: Investigate, Innovate, Inspire*, Kansas City, Missouri. "Access, Impact, and Success: From Community College to College to Graduate School." (60 minute presentation, co-presenter: M. Anderson-Rowland)

September 7, 2011 *AWC Science, Mathematics, and Engineering Faculty Meeting*, "Motivated Engineering Transfer Students Talent Expansion Program (METSTEP): ASU, and Arizona Western College," co-presenter: M. Anderson-Rowland

December 9, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "Future Directions for Control-Centric Design of Scramjet-Powered Hypersonic Vehicles."

October 7, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "An Approach for Control-Centric Design of Scramjet-Powered Hypersonic Vehicles."

September 9, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "Control-Centric Modeling and Design Issues for Scramjet-Powered Hypersonic Vehicles."

July 20, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "3DOF/6DOF Modeling and Approximation Issues for Scramjet-Powered Hypersonic Vehicles."

March 11, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "Analysis of Critical Maneuvers for Scramjet-Powered Hypersonic TSTO Booster Vehicles: Control Saturation Issues."

January 21, 2010 *NASA Ames Research Center*, Moffett Field, Mountain View, CA. "Rapid Robust Trimming and Linearization Algorithms Over the Trimmable Region for Control-Centric Analysis of Nonlinear Aero-Elastic-Propulsion Hypersonic Vehicle Models."

2010 *ASU Fulton School of Engineering S-STEM Seminar Series.*

“Engineering Grand Challenges and Career Opportunities,” ASU - Jan 22.

“Ongoing Outreach, Research, and Mentoring Activities,” April 22-23.

“Engineering, Research, Graduate School, and Career Opportunities: Meeting National Needs,” AWC - April 9; Cochise - Oct 5; EAC - Oct 18; ASU - Oct 22; ASU - Nov 4-5; Mohave - Nov 17.

November, 2007 *Athans 70 Symposium*, Tampa, Florida.  
“Fundamental Tradeoffs Associated with the Control of Scramjet-Powered Hypersonic Vehicles.”

April, 2007 *NASA Glenn Research Center*, North Olmstead, Ohio.  
“Control of Hypersonic Vehicles with Significant Aero-Thermo-Elastic-Propulsion Interactions and Uncertainty.”

April, 2007 *Cesar Chavez Panelist*, Arizona State University, Tempe, AZ.  
“STEM Career Opportunities and Socio-Political Issues.”

February, 2007 *PFF Seminar*, Arizona State University, Tempe, AZ.  
“Diversity in Academia and the Professoriate.”

November, 2006 *Universidad Nacional Autonoma de Mexico (UNAM)*, Mexico City, Mexico.  
“Multidisciplinary Research Opportunities in Electrical Engineering at Arizona State University.” Sponsored by Office of the President, Pan American Initiatives.

October, 2006 *Robustness in Social Ecological Systems; Workshop on Political Theory and Policy Analysis*, Indiana University, Bloomington, IN. “A Control-Theoretic Framework for Modeling, Analyzing, and Managing Robustness-Vulnerability Trade-Offs in Social-Ecological Systems.” Sponsored by Dr. Elinor Ostrom - 2009 Nobel Laureate in Economic Sciences.

February, 2005 *MGE@MSA Seminar Series*, Tempe, AZ.  
“Integrated Real-Time Embedded Health-Monitoring, Modeling, and Reconfigurable Controls.”

August, 2004 *NASA Ames Research Center*, Moffett Field, Mountain View, CA.  
“Integrated Real-Time Embedded Health-Monitoring, Modeling, and Reconfigurable Controls.”

April, 2003 *Fifth MGE@MSA Mentoring Institute*, Tempe, AZ.  
“The Need for Doctoral Mentors,” Workshop Co-Organizer and Moderator.

April, 2003 *MGE@MSA Graduate Student Research Conference*, Tempe, AZ.  
“The PhD and the Professoriate.”

March, 2002 *Third MGE@MSA Mentoring Institute*, Tempe, AZ.  
“Doctoral Mentoring: Making a Difference,” Workshop Co-Organizer and Moderator.

June, 2001 *ASEE Annual Conference*, Albuquerque, NM.  
“Development of ASU’s *MoSART-FAME* Research Program,”

January, 2001 *First MGE@MSA Student Research Conference*, ASU, Tempe, AZ.  
“Selecting a Graduate Advisor,”

January, 2001 *First MGE@MSA Mentoring Institute*, Tempe, AZ.  
“Ph.D. Mentoring: Getting Started,” Workshop Co-Organizer and Moderator.

January, 2001 *First MGE@MSA Mentoring Institute*, Tempe, AZ.  
“Ph.D. Mentoring 101: Making the Case and Making a Difference,” Workshop Co-Organizer and Moderator.

April, 2000 *ASEE/PSW Conference*, Tucson, AZ.  
“An Interactive *MoSART* Environment for Rotorcraft Control System Design,” Invited session.

April, 2000 ASEE/PSW Conference, Tucson, AZ.  
 "Toward the Development of a Flexible Testbed for Research in the area of FAME," Invited session.

April, 2000 ASEE/PSW Conference, Tucson, AZ.  
 "Development of an Interactive *MoSART* PUMA Robotic Manipulator Environment," Invited session.

April, 2000 ASEE/PSW Conference, Tucson, AZ.  
 "Interactive *MoSART* Robotic Pointing Device Environment," Invited session.

April, 2000 ASEE/PSW Conference, Tucson, AZ.  
 "Development of Interactive *MoSART* Pendulum Environments," Invited session.

April, 2000 ASEE/PSW Conference, Tucson, AZ.  
 "*MoSART-FAME* at ASU: Curricular Reform and Innovations In Controls," Invited session.

March, 2000 Arizona State University, Tempe, AZ.  
 "*FAME* Research at ASU."

November, 1999 Institute for Studies in the Arts: Technology Development Forum, Tempe, AZ.  
 "Multidisciplinary Research Opportunities in the Area of FAME: Collaboration Between the School of Engineering and the School of Fine Arts."

September, 1999 IEEE Seminar Series, Tempe, AZ.  
 "Awesome Opportunities in Engineering and the Value of IEEE Membership."

September, 1999 NSF-CMS-BES Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators (WEEs), Washington, D.C.  
 "Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) of Flexible Autonomous Machines operating in an uncertain Environment (*FAME*)."

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "Description of an Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Advanced Pendulum Environment," Invited session.

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "Description of an Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Submarine Environment," Invited session.

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "Description of Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Airplane Environment," Invited session.

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "Description of Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Helicopter Environment," Invited session.

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "Description of an Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Pendulum-Robotic Manipulator Environment," Invited session.

March, 1999 ASEE/PSW Conference, Las Vegas, NV.  
 "On the Development of Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Environments: Technological Integration for Enhancing Research and Education," Invited session.

January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
 "Development Of An Interactive *MoSART* Cart-Pendulum-Seesaw Environment," Invited session.

January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
 "Development Of An Interactive *MoSART* Multiple Pendulum Environment," Invited session.

- January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
“Development Of An Interactive *MoSART* Twin Lift Helicopter System (TLHS) Environment,” Invited session.
- January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
“Development Of An Interactive *MoSART* Submarine System Environment,” Invited session.
- January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
“On The Development Of Interactive *MoSART* Environments: The Microsoft Software Suite,” Invited session.
- January, 1999 International MultiConference on Computer Simulation, San Francisco, CA.  
“MoSART: A Unifying Theme For The Development Of Advanced Interactive Research And Education Tools,” Invited session.
- November, 1998 Arizona State University, Tempe, AZ, MIDL Seminar Series.  
“Development of Interactive Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) Environments for Research and Education.”
- June, 1998 University of Barcelona, Barcelona, Spain.  
“Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) of Flexible Autonomous Machines operating in an uncertain Environment (*FAME*).”
- June, 1998 6th IEEE Mediteranean Conference on Controls and Systems, Sardinia, Italy.  
“ $\mathcal{H}^\infty$  Optimal Sampled Data Control of Unstable Distributed Parameter Systems.”
- May, 1998 University of Barcelona, Barcelona, Spain.  
“Modeling and Control of Re-entrant Semiconductor Manufacturing Lines.”
- September, 1997 IEEE International Conf. on Emerging Technologies and Automation, UCLA.  
“Hierarchical Modeling and Control of Re-entrant Semiconductor Fabrication Lines: A Mini-Fab Benchmark.”
- June, 1997 American Control Conference, Albuquerque, NM.  
“Suggestions for Practical Research in Semiconductor Manufacturing Control: An Industrial Perspective.”
- January, 1997 International Conference on Simulation in Engineering Education, Phoenix, AZ.  
“Teaching Control System Design Concepts Using A Virtual Inverted Pendulum Environment.”
- January, 1997 International Conference on Simulation in Engineering Education, Phoenix, AZ.  
“Teaching Systems and Controls Using a MATLAB-Based Interactive Environment.”
- January, 1997 International Conference on Simulation in Engineering Education, Phoenix, AZ.  
“Interactive Environment for Teaching Systems and Controls: The Need for Educational Tools.”
- August, 1996 The Boeing Company, Seattle, WA.  
“Engineering Education: A Vision for Change.”
- June, 1996 The Boeing Company, Seattle, WA.  
“The *MoSART* Facility: Promoting Multidisciplinary Teaching and Research.”
- February, 1996 ASU Workshop on Semiconductor Manufacturing, Control, and Optimization, Tempe, Arizona.  
“Control of Re-entrant Semiconductor Fabrication Lines: An Inner-Outer Loop Approach.”
- October, 1995 Motorola International Symposium on Factory Integration and Modeling: 10X Cycle Time Improvement, Tempe, Arizona.  
“High Level Control for Re-entrant Semiconductor Fabrication Lines.”
- October, 1995 ASU Workshop on Semiconductor Manufacturing, Control, and Optimization, Tempe, Arizona.  
“Hierarchical Control for Re-entrant Semiconductor Fabrication Lines.”

September, 1995	Arizona State University, Tempe, Arizona. “A Release Policy Governor for Re-entrant Semiconductor Fabrication Lines.”
June, 1995	American Control Conference, Seattle, Washington. “Performance Enhancement for an $\mathcal{L}^1$ Missile Autopilot in the Presence of Saturating Actuators.”
June, 1995	American Control Conference, Seattle, Washington. “Performance Enhancement for an Unstable Missile in the Presence of Saturating Actuators: Partial Information.”
September, 1994	IFAC on Control of Aerospace Systems, Palo Alto, California. “Control of an Unstable Missile in the Presence of Saturating Actuators: Full Information.”
August, 1994	Guidance, Navigation, and Control Conference, Scottsdale, Arizona. “Missile Guidance and Control in the Presence of Actuator/Control Saturation.”
June, 1994	American Control Conference, San Francisco, California. “Control of a Bank-to-Turn Missile with Multiple Saturating Actuators.”
October, 1993	Arizona State University, Tempe, Arizona. “Modelling and Approximation of Distributed Parameter Systems.”
September, 1993	University of Texas, Austin, Texas. “Dynamic Control of Missiles with Multiple Hard Nonlinearities.”
September, 1993	University of Texas, Austin, Texas. “Hierarchical Control of a Flexible Space Telescope: SPICE.”
August, 1993	Eglin Air Force Base, Fort Walton Beach, Florida. “Control of a Bank-to-Turn Missile with Multiple Nonlinearities.”
February, 1990	Arizona State University, Tempe, Arizona. “Control of Infinite-Dimensional Plants Using Finite-Dimensional Techniques.”
December, 1989	University of Minnesota, Minneapolis, Minnesota. “A Finite-Dimensional Approach to Infinite-Dimensional $\mathcal{H}^\infty$ Optimal Control Problems.”
June, 1986	American Control Conference, Seattle, Washington. “Multivariable Control of a Twin Lift Helicopter System using the LQG/LTR Design Methodology.”
January, 1986	Nasa Ames Research Center, Moffett Field, California. “Application of Modern Control Techniques to Twin Lift.”
February, 1985	Sikorsky Aircraft, Stratford, Connecticut. “Robust Control of a Twin Lift Helicopter System.”

## 4 Research Grants

### 4.1 Sponsored Research: External Grants and Support

1. Co-PI: A.A. Rodriguez, “Academic and Professional Development for Engineering and Computer Science Students: From Upper-Division to Research, Graduate School, Academia, and the Skilled STEM Workforce,” NSF S-STEM, DUE 1060226, 06/01/2011-05/31/2015, PI: Mary R. Anderson-Rowland, \$600K.
2. Co-PI: A.A. Rodriguez, “Collaborative Research: Motivated Engineering Transfers-STEM Talent Expansion Program (METSTEP),” NSF STEP, DUE 0856834 09/01/2009-08/31/2014, PI: Mary R. Anderson-Rowland, Collaborators: Clark Vangilder - Central Arizona College, Danette Bristle - Mohave Community College, Richard Hall - Cochise County Community College District, Phil McBride - Eastern Arizona College, and Rakesh K. Pangasa - Arizona Western College, \$2M.



3. PI: A.A. Rodriguez, "Evaluation of a Suite of Interactive Modeling, Controls, Rapid Prototyping, and Embedded System E-Book Modules," NSF TUES, DUE 0817584, 07/15/2009-12/31/2013, Co-PIs: B.D. Welfert, J.M. Anderies, K.S. Tsakalis, N.F. Macia, \$49,910.
4. PI: A.A. Rodriguez, "Robust Hierarchical Control (Hi-C) for Future Hypersonic Vehicles with Aero-Thermo-elastic-Propulsion Interactions," NASA Ames Research Center, Award #06-HYP-06-0112, 1/20/2006-1/19/2009, total funding: \$555,166.
5. PI: A.A. Rodriguez, "Academic and Professional Development for Upper-Division Computer Science, Engineering, and Mathematics Students - II: Transition to Research, Graduate School, and the Workforce," NSF S-STEM, DUE 0728695, 09/01/2007-02/28/2014, Co-PIs: M.R. Anderson-Rowland, A.W. Richa, C.C. Chavez, \$600,000.
6. PI: A.A. Rodriguez, "Academic and Professional Development for Lower Division Computer Science, Engineering, and Mathematics Students: Transition to Upper-Division, Research and the STEM Workforce," NSF S-STEM, DUE 0807134 08/01/2008-01/31/2014, Co-PIs: M.R. Anderson-Rowland, A.W. Richa, C.C. Chavez, \$600,000.
7. Co-PI: A.A. Rodriguez, "Academic and Professional Development for Upper-Division Computer Science, Engineering, and Mathematics Students: Transitioning to Research, Graduate School, and the CSEM Workforce," NSF-CSEMS DUE-0631189, 9/15/2006-8/31/2011, PI: M. Anderson-Rowland, \$500,000, Industrial Partners: Intel \$40K (\$10K per year).
8. PI: A.A. Rodriguez, "Modeling, Uncertainty Characterization, and Control of Hypersonic Waveriders with Significant Aero-Thermo-Elastic Propulsion Interactions," ASA GSRP Fellowship for Jeffrey Dickeson, 2007-2010, NNX07AU21H, \$90,000.
9. Co-PI: A.A. Rodriguez, "HSD: Integrated Analysis of Robustness in Dynamic Social Ecological Systems," NSF-BCS, BCS-0527744, 9/1/2005-2/28/2009 (42 months), PI: J.M. Anderies, Co-PIs: A.P. Kinzig, M.A. Janssen, C. Perrings, total: \$749,278.
10. PI: A.A. Rodriguez, "Rapid Prototyping for Embedded System Applications Via High Level Development Tools," NSF-CCLI-EMD, Award #0443133, 5/1/2005-04/30/2008, Co-PIs: K.S. Tsakalis, D. Allee, J. Si, total: \$75K.
11. Co-PI: A.A. Rodriguez, "Embedded Control Systems II," Consortium for Embedded and Inter-Networking Technologies (CEINT), 11/1/2005-12/31/2006, PI: K.S. Tsakalis, Co-PI: J. Si, total: \$43,013.
12. Co-PI: A.A. Rodriguez, "IGERT: An Arts, Sciences and Engineering Research and Education Initiative for Experiential Media," NSF-DGE, Award #0504647, 11/1/2005-9/30/2006, PI: T. Rikakis, Co-PIs: A. Spanias, W. Savenye, J.P. He, H. Sundaram, total: \$646,578.
13. Co-PI: A.A. Rodriguez, "MGE@MSA AGEP Phase II," NSF-AGEP, Award #0450137 3/01/2005-2/28/2010, PI: A.L. McHenry, 18 Co-PIs, total: \$9M (\$1.8M current).
14. Co-Director: A.A. Rodriguez, "LSAMP Applied Mathematical and Electromechanical Dynamic (AMED) Bridges to the Doctorate," NSF-HRD-LSAMP-WAESO, 8/2004-7/2006, PI: A. Garcia, Co-Director: C.C. Chavez. Provides 12 fellowships over 2 years (\$30K per year plus tuition and other expenses). total: \$987,000.
15. PI: A.A. Rodriguez, "A Flexible Embedded System Architecture for Integrated Real-Time Health Monitoring, Modeling, and Control," Consortium for Embedded and Inter-Networking Technologies (CEINT), 05012112, 8/25/2004-12/24/2006, Co-PIs: K.S. Tsakalis, J. Si, \$75,137.
16. PI: A.A. Rodriguez, "Control of Spacecraft and Flexible Structures," NASA Ames Research Center, 7/2004-12/2005, \$13,000.
17. PI: A.A. Rodriguez, "Academic and Professional Development for Computer Science, Engineering, and Mathematics Students," NSF-CSEMS, DUE-0422447, 8/01/2004-7/31/2008, Co-PIs: A. Richa, C.C. Chavez, Industrial Partners: Intel \$40K (\$10K per year), total: \$399,968.
18. Co-PI: A.A. Rodriguez, "A Control-Theoretic Approach to Learning and Approximate Dynamic Programming (ADP) with Applications to High Performance Racing," NSF, ECS-0401405, 5/1/04 - 4/30/07, PI: J. Si, Co-PI: K.S. Tsakalis, \$190K.
19. Co-PI: A.A. Rodriguez, "Embedded Control Systems: Undergraduate Course Development," Consortium for Embedded and Inter-Networking Technologies (CEINT), 1/1/2004-5/31/2005, PI: K.S. Tsakalis, Co-PI: J. Si, \$56,588.

20. PI: A.A. Rodriguez, "Development of an Interactive Systems and Controls E-Book," NSF-CCLI-EMD 0231440, 2/15/2003-4/30/2007, Co-PI's: W. Higgins, F. Hoppensteadt, E. Kostelich, J. Si, T. Sugar, B. Welfert, V. Wells, total: \$354,310 (\$307,910 NSF, \$46,400 matching). Industrial Partners: Boeing, Honeywell, Intel, MathWorks, Microsoft, Motorola, Raytheon.
21. Consultant: A.A. Rodriguez, "Doctoral Mentoring Institutes: Increasing Ph.D. Production in the Southwest," NSF-MGE@MSA, Hispanic Research Center, KMW8868, KMD5279, Summer 2002, \$17,392.
22. Co-PI: A.A. Rodriguez, "Scholarships for Computer Science, Engineering, and Mathematics Students (CSEMS)," NSF 0094915, 1/15/2001-12/31/2002. Provides 80 scholarships for lower division students. PI: J. Bustoz, Co-PI: A. Richa, \$270,000.
23. Co-PI: A.A. Rodriguez, "Scholarships for Computer Science, Engineering, and Mathematics Students (CSEMS)," NSF-CSEMS, DUE 9987277, \$495,000, 4/1/2000-3/31/2004. Provides 160 scholarships for upper division students. PI: J. Bustoz, Co-PIs: A.W. Richa, B.D. Gannod, J.C. Turner.
24. Industrial Fund Raising for ASU IEEE Student Branch, \$40,000, 8/97-present. Donors have included: Intel, Microsoft, Motorola, Honeywell, OnSemiconductor, IBM, Lockheed Martin, AG Communications, Accenture, Boeing, National Instruments, TDK, etc. Funds are used to support branch activities and undergraduate research projects in the area of *FAME*.
25. PI: A.A. Rodriguez, "IEEE Center of Excellence for FAME Research," Institute for Electrical and Electronics Engineers (IEEE), \$7,000 (\$5K IEEE, \$2K ASU), 1999.
26. PI: A.A. Rodriguez, "*MoSART-FAME*: A Unifying Theme for Mentoring of Science, Mathematics, and Engineering Students," 1998 White House Presidential Awardee for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM), NSF 9814738, 9/1/98-8/31/2001, total: (including matching) \$30,000.
27. PI: A.A. Rodriguez, "*MoSART*: A Multidisciplinary Undergraduate Controls Laboratory," NSF 9851422, 8/20/98-8/19/2002, Sponsors included: Intel, Microsoft, CADSI, and Integrated Systems, Co-PIs: W.T. Higgins, K.S. Tsakalis, J. Si, F. Hoppensteadt, M. Kawski, J. Shah, J. Puig-Suari, J. Kuo, total (including matching): \$254,089 (\$95,442 plus matching).
28. PI: A.A. Rodriguez, "Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) of Semiconductor and Other Distributed Processes," NSF/WAESO, \$5,000 for 8/98-12/98, \$5,000 for 1/99-5/99, total: \$10,000.
29. PI: A.A. Rodriguez, "Modeling, Simulation, Animation, and Real-Time Control (*MoSART*) of Semiconductor and Other Distributed Processes," NSF/WAESO, \$8,000 for 8/97-12/97, \$6,800 for 1/98-5/98, total: \$14,800.
30. A.A. Rodriguez (PI), M. Kawski, "Modeling and Control of Re-entrant Semiconductor Fabrication Facilities: Design of Low-Level Decision Policies," Intel Corporation Research Council, \$40K, two (2) 90 MHz Pentium Computers - value: \$20K, DWT-4608, 1/95-1/96, \$40K, 1/96-1/97, \$40K, 1/97-1/98, total: \$140,000. Share: \$126K.
31. PI: A.A. Rodriguez, "Graphical Visualization of Semiconductor and Other Distributed Processes," NSF/Coalition to Increase Minority Degrees (CIMD), \$13,200 for 1/94-5/94, \$26,000 for 5/94-8/94, \$23,400 for 8/94-12/94, \$31,200 for 1/95-5/95, \$13,000 for 6/95-8/95, \$15,600 for 9/95-12/95, \$15,600 for 1/96-5/96, total: \$138,400.
32. G. Maracas (PI), Contracted: K.S. Tsakalis and A.A. Rodriguez, "Modelling and Control of Molecular Beam Epitaxy Systems," ARPA, 7/7/95-19/28/98, Project director: Professor Dieter Schroder, \$1.7M, Tsakalis, Rodriguez value: \$150,041. Share: \$75K.
33. G. Maracas (PI), Contracted: A.A. Rodriguez, "Data Acquisition and Reflectance Analysis for Molecular Beam Epitaxy Systems," ARPA, 8/95-7/96, Transitional project director: Professor Dieter Schroder. Share: \$50,000.
34. PI: A.A. Rodriguez, "MoSART-FAME: A Unifying Theme for Multidisciplinary Research and Curricular Innovation," *Boeing A.D. Welliver Faculty Fellowship*, Summer 1996, \$25,000.
35. PI: A.A. Rodriguez, "Development of Control Design Methodologies for Flexible Systems with Multiple Hard Nonlinearities," AFOSR Faculty Research Initiation Award, Contract # F49620-90-09076, 8/93-8/94, \$20,000, total: (including summer salaries) \$44,000.

36. W.T. Higgins (PI), A.A. Rodriguez, P.E. Crouch, K.S. Tsakalis, "Undergraduate Control Systems Design Laboratory," NSF 9251935, DWE-2442, 5/1/92-10/31/94, total: (including matching) \$100,464. Share: \$25.1K.

### Software/Equipment Grants/Donations

37. Tektronix Spectrum Analyzer for *Intelligent Embedded Systems Laboratory*, Feb. 2005, \$50K.
38. Tektronix Oscilloscopes for *Intelligent Embedded Systems Laboratory*, Dec. 2004, \$60K.
39. Xilinx Field Programmable Gate Array (FPGA) Rapid Prototyping Spartan III Development Platforms for *Intelligent Embedded Systems Laboratory*, Dec. 2004, \$163,000.
40. 1750<sup>+</sup> Doped 4 Inch Prime Wafers, Motorola, "Doped 4 inch Prime Wafers for MoSART-FAME Semiconductor Research," 12/2000, \$21,024.  
259 D92654W055 Prime Wafers: 500 – 550 $\mu$ m thickness, Phosphorus doping, 7.5 – 12.5 $\Omega$  – cm resistivity.  
720 D92654W066 Prime Wafers: 500 – 550 $\mu$ m thickness, Boron doping, 14.0 – 22.0 $\Omega$  – cm resistivity.  
768 D92654W094 Prime Wafers: 500 – 550 $\mu$ m thickness, Boron doping, 14.0 – 22.0 $\Omega$  – cm resistivity.
41. 900K Integrated Circuits/Devices and Storage Cabinets, OnSemiconductor, "Integrated Circuits for MoSART-FAME Research," 12/2000, \$50,000<sup>+</sup>.
42. Seven (7) 800 MHz Pentium III Workstations, Intel Corporation, "PCs for FAME Research and Prototyping Facility," 11/2000, \$25,000.
43. Windows NT Software Development Tools, Microsoft Inc., "The *MoSART* Facility: A Multidisciplinary Laboratory," 3/99, \$30,000.
44. MathWorks Software Suite, MathWorks, 3/99 "MoSART-FAME: A Theme for Multidisciplinary Curricular Innovation," \$1,523,500.
45. 25 266 MHz Pentium II/MMX Workstations, Intel Corporation, "The *MoSART* Facility: A Multidisciplinary Laboratory," 3/98, \$80,000.
46. Windows NT Software Development Tools, Microsoft Inc., "The *MoSART* Facility: A Multidisciplinary Laboratory," 2/98, \$38,484.
47. DADS/Plant Development Software, CADSI, 6/97, "The *MoSART* Facility: A Multidisciplinary Laboratory," \$135,000.
48. MATRIX<sub>x</sub> Development Software, Integrated Systems, 6/97, "The *MoSART* Facility: A Multidisciplinary Laboratory," \$70,000.
49. Working Model 2D and 3D, Knowledge Revolution, 6/97, "The *MoSART* Facility: A Multidisciplinary Laboratory," \$65,000.
50. Windows NT Software Development Tools, Microsoft Inc., "The *MoSART* Facility: A Multidisciplinary Laboratory," 1/97, \$23,000.
51. 25 200 MHz Pentium Pro Workstations, Intel Corporation, "The *MoSART* Facility: A Multidisciplinary Laboratory," 1/97, \$133,000.
52. MATRIX<sub>x</sub> Software, Integrated Systems for 1/94-7/95, \$3,000.
53. HP-735 Workstation, NSF/GEM, Project: "Sampled Data Control of Large Space Structures," 6/94, \$15,000.

### External Scholarship/Fellowship Support for Students<sup>1</sup>

54. NSF Fellowship, Justin Echols, EE, 2013-2016, \$150K.
55. GEM Fellowship, Michael J. Thompson, MAE, 2013-2015, \$18K.
56. NASA GSRP Fellowship, Jeffrey J. Dickeson, EE, 2007-2010, NNX07AU21H, "Modeling, Uncertainty Characterization, and Control of Hypersonic Waveriders with Significant Aero-Thermo-Elastic Propulsion Interactions," \$90K.

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<sup>1</sup>Research has been supported, in part, by fellowships for graduate students.

57. NSF LSAMP Bridge to the Doctorate Fellowship, Daniel Cartagena, EE, 2004-2006, \$73.339K.
58. GEM Fellowship, Jose Benavides, EE, 2006-2007, \$10K.
59. ARCS Foundation Fellowship, Richard Metzger, EE, 2001-2003, \$16.4K (\$12K stipend, \$4.4K tuition).
60. NSF Fellowship, John Koenig, EE, 2000-2002, \$57,000 (\$28.5K/year, \$18K/year stipend, \$10.5K/year to ASU).
61. GEM Fellowship, Daniel Cartagena, EE, 1998-2000, \$26K.
62. Fulbright Fellowship, Jose Hernandez, EE, 1998-2000, \$26,000.
63. Fulbright Fellowship, Carlos Rios, EE, 1998-2000, \$26K.
64. Goldwater Scholarship<sup>2</sup>, Mark F. Deherrera, EE, 1996-1997, \$7K.
65. GEM Doctoral Fellowship, Delano R. Carter, EE, 1993-1998, \$45K.
66. IBM Graduate Fellowship, Shawn Mahloch, EE, 1992-1994, \$20,000.
67. Honeywell Graduate Fellowship, Keath Reynolds, EE, 1990-1993, \$30K.
68. Honeywell Graduate Fellowship, Charles Tolle, EE, 1990-1993, \$30K.

## 4.2 Sponsored Research: Internal Grants and Support

1. PI: A.A. Rodriguez, Co-PI's: W. Higgins, F. Hoppensteadt, E. Kostelich, J. Si, T. Sugar, B. Welfert, V. Wells, "Development of an Interactive Systems and Controls E-Book," NSF-CCLI-EMD-DUE-0231440 Cost Share, \$46,000, 2003-2006.
2. A.A. Rodriguez, "Development of a Web-Based Dynamic Systems Modeling Class for the Tri-University Masters of Engineering Program," CEAS, Summer, 2001, \$14,520. This includes \$2K in summer support for a graduate assistant.
3. A.A. Rodriguez, "Development of ASU's *MoSART-FAME Facility*," ASU, CEAS, 6/2000, total: \$4,000.
4. A.A. Rodriguez, "Development of a Web-Based Feedback Systems Class for the Tri-University Masters of Engineering Program," CEAS/NSF, Summer, 1999, \$11,000. This includes \$2K in summer support for a graduate assistant.
5. A.A. Rodriguez and C.Y. Kuo, "Development of ASU's *MoSART-FAME Facility*," ASU, CEAS, 3/99, total: \$40,000.
6. PI: A.A. Rodriguez, "Toward the Development of a First-Of-Its-Kind Interactive Multidisciplinary Multimedia Systems and Controls Hypertext," ASU, Center for the Innovation In Engineering Education (CIEE), 5/99-8/99, total: \$6,000.
7. PI: A.A. Rodriguez, W. Higgins, J. Si, K. Tsakalis, "Development of the *MoSART Facility*," CEAS/EE, DW1-1001, 4/98, \$15,360.
8. PI: A.A. Rodriguez, "Distributed Simulation," University Research Council Program, ASU-FGIA, DWR-J029, 1/15/97-1/15/98, \$6,000.
9. PI: A.A. Rodriguez, "Development of the *MoSART Facility*," CEAS/EE, DW1-1001, 4/97, \$20,000.
10. PI: A.A. Rodriguez, "Development of Tools for Enhancing the Teaching of Modeling, Simulation, and Control of Dynamical Systems Across the Engineering Curriculum," ASU, Center for the Innovation In Engineering Education (CIEE), DW1-1001, 5/95-5/96, \$6,000, 5/96-5/97, \$6,000, total: \$12,000.
11. PI: A.A. Rodriguez, "Development of a Multidisciplinary Research Laboratory," ASU, College of Engineering and Applied Science (CEAS), DW1-1001, 3/95, \$10,000.
12. PI: A.A. Rodriguez, "Improvement of Undergraduate Education," Arizona State University, College of Engineering and Applied Science (CEAS), Department of Electrical Engineering, XDF-9601, 3/95, \$9,999.

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<sup>2</sup>Congressionally funded scholarship.

13. PI: A.A. Rodriguez, "Development of Controller Design Methodologies for Infinite-Dimensional Systems," ASU-FGIA, DWR-B773, 1/15/92-1/15/93, \$5,500.
14. PI: A.A. Rodriguez, "Approximation of Infinite-Dimensional Systems Based on Closed-Loop Performance Criteria," ASU-FGIA, DWR-B717, 1/15/91-1/15/92, \$5,000.
15. PI: A.A. Rodriguez, "Control of Distributed Parameter Systems," ASU, Office of the Provost, DW1-1001, 2/5/91, \$25,000.
16. PI: A.A. Rodriguez, "Modeling of Distributed Parameter Systems," ASU, Office of the Dean, DW1-1001, 11/30/90, \$11,250.

### **Internal Awards and Scholarship Support**

17. A.A. Rodriguez, "ASU Professor of the Year Finalist Award," 2001, 2002, 2003 \$2,000.
18. CEAS-ISA Graduate Research Assistantship for Venkatesh Harikrishnan, Summer 2002: \$3,240, Fall 2002: \$2,750, 2002 Out-of-State: \$3,000, Spring 2003: \$2,750, total: \$11,740.
19. CEAS-ISA Graduate Research Assistantship for Oguzhan Cifdaloz, 5/2000–present, Summer-Fall 2000: \$2,500, 2001: \$17,500 (Spring : \$5,500, Summer: \$2,500, Fall: \$5,500, Out-of-State: \$3,000, Ins: \$1,000), 2002: \$15,000 (Spring : \$5,500, Fall: \$5,500, Out-of-State: \$3,000, Ins: \$1,000), 2003: \$7,500 (Spring : \$5,500, Out-of-State: \$1,500, Ins: \$500), total: \$42,500.
20. CEAS-ISA Graduate Research Assistantship for Richard P. Metzger, 1/99–5/00, \$19,000.
21. ASU CEAS Teaching Excellence Award, 1999, \$1,000.
22. EE Graduate Scholarship for Chen-I Lim - 1998 Distinguished Senior Award Recipient, 8/98–12/99, \$25,355.
23. A.A. Rodriguez, "Development of Controller Design Methodologies for Distributed Parameter Systems with Multiple Hard Nonlinearities," ASU, Research Incentive Award, RIA 185-94, DWR-R237 (University), DW5-1006 (EE), 1/95–1/96, \$16,000.
24. EE Graduate Scholarships<sup>3</sup>, one (1) doctoral student (Mr. Mohamad Eladl) and one (1) masters student (Mr. Hendrix Hartana), ASU, Department of Electrical Engineering, Scholarships provide support for "Control of Re-entrant Semiconductor Fabrication Lines," 1994-1996, total: \$29,200.
25. A.A. Rodriguez, *Young Faculty Teaching Excellence Award*, ASU, College of Engineering and Applied Science (CEAS), Used toward purchase of an HP-735 Workstation in support of "Sampled Data Control of Large Space Structures," DW1-1001, 1992, \$1,000.

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<sup>3</sup>Research has been supported, in part, by scholarships for graduate students.

## 5 Student Dissertation/Thesis and Project Supervision

### Student Dissertation/Thesis Supervision (Completed)

#### PhD

1. Justin Echols, Ph.D., *Electrical Engineering*, NSF Fellow, *Robust Control of Distributed Parameter Systems*, Expected: 2017.
2. Karan Puttannaiah, Ph.D., *Electrical Engineering*, *Robust Control of Nonlinear Dynamical Systems*, Expected: 2017.
3. Daniel Cartagena, Ph.D., *Electrical Engineering*, NSF-LSAMP, GEM Fellow, *Thermal Control for Multi-Core Processors*, Expected: 2017.
4. Michael Thompson, Ph.D., *Mechanical Engineering*, NASA-GEM Fellow, *Modeling and Control-Relevant Design of a Flapping-Wing Micro Air Vehicle*, Expected: 2017.
5. Srikanth Sridharan, Ph.D., *Electrical Engineering*, Supported by NASA, NSF, EE, *Achievable Performance for Complex Dynamical Systems*, Graduated February 12, 2014.
6. Jeffrey J. Dickeson, Ph.D., *Electrical Engineering*, NASA GSRF Fellow, *Control-Relevant Modeling and Design of Scramjet-Powered Hypersonic Vehicles*, April 12, 2012.
7. Oguzhan Cifdaloz, Ph.D., *Electrical Engineering*, Supported by NSF RA and EE-ISA Research Assistantship.  *$H^\infty$  Mixed-Sensitivity Optimization for Infinite-Dimensional Plants Subject to Convex Constraints*, February 21, 2007. Held post-doctoral position at ASU under Professors Anderies and Rodriguez (2007-2009). Post-Doctoral Research Topics: Sustainability, Modeling and Control of Hypersonic Vehicles.
8. Yu-Lung Yi, Ph.D., *Electrical Engineering*, Supported by EE Teaching Assistantship. *Saturation Prevention for a Class of LPV Systems*, August 1, 2003.
9. Mohammed ElAdl, Ph.D., *Electrical Engineering*, Supported Intel Grant. *Modeling and Control of Semiconductor Manufacturing Facilities*, April 22, 2002. Currently employed at Honeywell.
10. Delano R. Carter, Ph.D., *Electrical Engineering*, GEM Fellow. *Sampled Data Control of Distributed Parameter Systems*, March 12, 1998. Currently CEO of consulting company.

#### MS

1. Venkatraman Renganathan, M.S., *Electrical Engineering*, *Kill-Zone Analysis for a Bank-to-Turn Missile-Target Engagement*, Expected: August 2016.
2. Zhichao Li, M.S., *Electrical Engineering*, *Modeling and Control of a Longitudinal Platoon of Ground Robotic Vehicles*, Expected: August 2016.
3. Xianglong Lu, M.S., *Electrical Engineering*, *Modeling, Control and Mapping for a Rear-Wheel Drive Ground Robotic Vehicle*, Expected: August 2016.
4. Jesus Aldaco, M.S., *Electrical Engineering*, *Image Processing Based Control of Mobile Ground Robotic Vehicles*, Expected: 2016.
5. Zhenyu Lin, M.S., *Electrical Engineering*, *Modeling, Design and Control of Multiple Low-Cost Robotic Ground Vehicles*, September 4, 2015.
6. Kaustav Mondal, M.S., *Electrical Engineering*, *Multivariable Control of Fixed-Wing Aircraft*, April 20, 2015.
7. Aratrik Sarkar, M.S., *Electrical Engineering*, *Modeling and Control of a Three-Phase Voltage Source Inverter with an LCL Filter*, April 20, 2015.
8. Shiba Biswal, M.S., *Mechanical Engineering*, *Modeling and Control of a Flapping-Wing Micro Air Vehicle*, April 20, 2015.

9. Karan Puttannaiah, M.S., *Electrical Engineering,  $\mathcal{H}^\infty$  Control Design Via Convex Optimization: Toward a Comprehensive Design Environment*, November 21, 2013.
10. Iman Anvari, M.S., *Electrical Engineering, Non-Holonomic Differential Drive Mobile Robot Control and Design: Critical Dynamic and Coupling Constraints*, November 20, 2013.
11. Dhruv Chopra, M.S., *Electrical Engineering, Feedback Control and Obstacle Avoidance for Non-Holonomic Differential Drive Mobile Robots*, November 20, 2013.
12. Jaidev Khatri, M.S., *Electrical Engineering, Modeling, Analysis, and Control of a Hypersonic Vehicle with Significant Aero-Thermo-Elastic-Propulsion Interactions: Elastic, Thermal and Mass Uncertainty*, November 19, 2010.
13. Akshay Shashikumar Khorad, M.S., *Electrical Engineering, Modeling, Analysis and Control of a Hypersonic Vehicle With Significant Aero-Thermo-Elastic-Propulsion Interactions, and Propulsive Uncertainty*, April 23, 2010.
14. Divakar Chitturi, M.S., *Electrical Engineering, Portfolio Modeling, Analysis and Management*, October 29, 2010.
15. Srikanth Sridharan, M.S., *Electrical Engineering, Control Relevant Design of Scramjet-Powered Hypersonic Vehicles with Aero-Elastic-Propulsive Effects and Uncertainty*, Graduated December 4, 2009.
16. Robert McCullen, M.S., *Electrical Engineering, Modeling and Control of Scramjet-Powered Hypersonic Vehicles with Aero-Thermo-Elastic-Propulsive Effects*, November 10, 2008.
17. Kapil Sekhar, M.S., *Electrical Engineering, Construction, Modeling, Analysis, and Control of a Low-Cost Differential Steer Mobile Robot*, October 29, 2008.
18. Jose V. Benavides, M.S., *Electrical Engineering, GEM Fellow, Design and Rapid Prototyping of Robust Fault-Tolerant Embedded Control Systems using Field Programmable Gate Arrays (FPGAs)*, March 4, 2009.
19. Jeffrey J. Dickeson, M.S., *Electrical Engineering, Gain-Scheduled  $\mathcal{H}^\infty$  Controller Design for the Hover-to-Cruise Conversion of a Tilt-Wing Rotorcraft*. April 5, 2007.
20. David Wayne Miles, M.S., *Electrical Engineering, LPV Modeling and  $\mathcal{H}^\infty$  Control of a Tiltwing Rotorcraft*, April 4, 2007.
21. Miguel F. Garcia, M.S., *Electrical Engineering, NSF-LSAMP Fellow, Modeling and Control of Flexible Spacecraft*, March, 2007.
22. Robert Whitley, M.S., *Electrical Engineering, Analysis and Multivariable Control of Rotorcraft*, May 16, 2005. Currently employed at Intel.
23. David Mix, M.S., *Electrical Engineering, Multivariable Control for a Tilt-wing Rotorcraft*, December, 3, 2004. Currently employed at Orbital Science.
24. Walter Sharp, M.S., *Mechanical Engineering, Multivariable Control of a Tiltwing Rotorcraft (HARVEE)*, May, 6, 2004. (Co-advisor with MAE Professor Valana Wells.)
25. John S. Koenig, M.S., *Electrical Engineering, NSF Fellow, MoSART for a Tiltwing Rotorcraft*, August 20, 2002. Currently employed at NASA Jet Propulsion Laboratory.
26. Marco Antonio Shayeb, M.S., *Electrical Engineering, Control System Design Via Convex Optimization*, May 4, 2002.
27. Oguzhan Cifdaloz, M.S., *Electrical Engineering, Supported by EE-ISA Research Assistantship. Multivariable Control of an X-29 Aircraft*, May 4, 2002.
28. Daniel Cartagena, M.S., *Electrical Engineering, GEM Fellow, An Overview of Saturation Prevention Strategies*, September 22, 2000. Currently employed at Intel.
29. Richard P. Metzger, M.S., *Electrical Engineering, Modeling, Simulation, Animation, and Real-Time (MoSART) Control of Dynamical Systems: Airplanes, Pendulums, and Robots*, Supported, in part, by EE-ISA Research Assistantship and EE Teaching Assistantship, May 15, 2000. Currently employed at United Technologies.

30. Tae-Young Kim, M.S., *Electrical Engineering*. International Fellow, *Modeling, Simulation, Animation, and Real-Time (MoSART) Control of Aircraft*, March 1, 2000. Currently employed at Toshiba.
31. Sung-Sik Kwak, M.S., *Electrical Engineering*. International Fellow, *Modeling, Simulation, Animation, and Real-Time (MoSART) Control of a High Performance Submarine*, March 1, 2000. Completed Ph.D. in Industrial Engineering at ASU.
32. Jose Hernandez, M.S., *Electrical Engineering*, Fulbright Fellow, *Modeling, Simulation, Animation, and Real-Time (MoSART) Control of Flexible Mobile Pendulum Systems*, March 1, 2000. Completed Ph.D. in Industrial Engineering at ASU. Currently employed at Intel.
33. Chen-I Lim, M.S., *Electrical Engineering*. Department Fellow, *Modeling, Simulation, Animation, and Real-Time (MoSART) Control of Helicopter Systems*. Supported by ASU Teaching Assistantship, December 10, 1999. Currently employed at Microsoft.
34. Carlos Rios, M.S., *Electrical Engineering*. Fulbright Fellow, *Modeling, Simulation, Animation, and Real-Time (MoSART) Control of a Seesaw-Inverted Pendulum System*, August 20, 1999. Currently employed at National Instruments.
35. Hendrix Hartana, M.S., *Electrical Engineering*. Supported by Intel Grant, *Control of Re-entrant Semiconductor Fabrication Lines: A 5-Machine 6-Step Mini-Fab Benchmark*, December 15, 1997.
36. Kevin Hicks, M.S., *Electrical Engineering, Multivariable Control for the Apache Helicopter System*, December 1, 1996.
37. H. Keith Reynolds, M.S., *Electrical Engineering*. Honeywell Fellow,  $\mathcal{H}^\infty$  *Control of a Twin Lift Helicopter System*, October 28, 1996. Currently employed at Honeywell.
38. Mark Kuhns, M.S., *Electrical Engineering, A CMG Preferred Trajectory Tracking Singularity Avoidance Algorithm*, December 7, 1995. Currently employed at Honeywell.
39. Charles R. Tolle, M.S., *Electrical Engineering*. Honeywell Fellow, *Application of Dynamic Interpolation to Aircraft Vertical Guidance*, November 8, 1994. Completed doctorate in the area of Systems and Controls at Utah State University. Currently employed at Idaho National Engineering and Environmental Laboratory.
40. Mitchell Sonne, M.S., *Electrical Engineering. Development of PC Graphics for the Evaluation of Missile Guidance and Control Systems*, May 1, 1994. Currently employed at CHI Systems, Inc.
41. Shawn H. Mahloch, M.S., *Electrical Engineering*. IBM Fellow, *Approximation of Infinite-Dimensional Systems for Control Design*, December 10, 1993.

### Honors Theses

1. Carl Stevenson, B.S., *Electrical Engineering, Control of Multiple Ground Robotic Vehicles*. Expected: December, 2016.
2. Adam Polak, B.S., *Aerospace Engineering, Modeling and Control of a Quadrotor Vehicle*. November 7, 2014.
3. John S. Koenig, B.S., *Electrical Engineering*. NSF Supported. *Control of a High Speed Tiltwing Rotorcraft*. December 11, 1998. Went on to receive NSF Fellowship and complete MS with AAR.
4. Sean C. Warnick, B.S., *Electrical Engineering*. AFOSR Supported. *Control of a Platoon of Vehicles with Saturating Actuators*. May 21, 1993. Obtained doctorate in Controls at the Massachusetts Institute of Technology (MIT). Currently on the engineering faculty at Brigham Young University (BYU).

### Undergraduate Research-Mentoring Program

Over 200 undergraduate research projects supervised as part of a funded research-mentoring program in the area of *Modeling, Simulation, Animation, and Real-Time Control (MoSART) of Flexible Autonomous Machines operating in an uncertain Environment (FAME)*.



- Received *1998 White House Presidential Award* from President Bill Clinton for contributions to Science, Technology, Engineering, and Mathematics (STEM) mentoring.

### Selected Design Projects and Honors Theses

- Modeling, Simulation, Analysis, and Development of a Sonar Ranging System for Vehicle Platooning, Fall 2001-Spring 2002, received Spring 2002 Best Senior Design Project Award (Ricardo Arvizu, Nevada Jack, David Mix, Melissa Santa Cruz). David Mix completed an MS thesis with me in 2004.
- Modeling, Simulation, Animation, and Real-Time Control (MoSART) of a Tiltwing Rotorcraft System, Student Undergraduate Honor's Thesis, received 1999 IEEE Best Student Paper Award (John S. Koenig). John S. Koenig completed an MS thesis with me in 2002 (supported by NSF Fellowship).
- Modeling, Simulation, Animation, and Real-Time Control (MoSART) of a Helicopter System, Student Project, received 1998 IEEE Best Student Paper Award (Chen-I. Lim). Chen-I. Lim completed an MS thesis with me in 1999.
- Design of a Small Remote Controlled Robotic Vehicle with Wireless Vision, Spring 2000 Senior Design Project (Jason Orsborn, Mike J. Hansen, Joseph A. Garrison).
- Design of a Testbed for *FAME* Research: A Large Remotely Controllable Robotic Vehicle with Wireless Vision and Communications, received Fall 1999 Best Senior Design Project Award (Andrew Pitts, Christopher Hornberg, James DeFalco, Elizabeth Olivanti). Christopher Hornberg completed his MS thesis in 2004.
- Modeling, Simulation, Animation, and Real-Time Control (MoSART) of a Ball and Beam System, received Spring 1998 Best Senior Design Project Award, (Chen-I. Lim, Mark Hunt, Kiyong Choi).

### Publications with Students

Over 100 technical publications with ASU students. Students have worked on projects within the following *MoSART-FAME* areas:

- **Theoretical Areas.** Dynamic modeling, multivariable control system design, systems with multiple hard nonlinearities, linear parameter varying (LPV) systems, gain scheduling, control of infinite-dimensional/distributed parameter systems, sampled-data control, multi-rate control, system identification, real-time control.
- **Application Areas.** Missiles, fixed- and rotary-winged aircraft, jet engines, satellites, control moment gyros, robots, electromechanical systems, laboratory experiments, flexible structures, submarines, intelligent vehicles, semiconductor fabs, semiconductor processes, semiconductor furnaces, power electronics, adaptive learning algorithms, embedded systems.

## 6 Professional and Scientific Service

### National Scientific Committees

2011-2014

MEMBER, NATIONAL ACADEMIES ARL TECHNICAL ASSESSMENT BOARDS, **National Academy of Engineering**, Washington, DC.

- National Academies Panel on Information Science for Autonomous Systems, Army Research Laboratory (ARL), Adelphi, MD, August 13-15, 2013
- National Academies Panel on Survivability and Lethality Analysis, ARL Survivability and Lethality Analysis Directorate (SLAD), Aberdeen Proving Grounds, MD, May 29-June 1, 2012
- National Academies Panel on Survivability and Lethality Analysis, ARL Survivability and Lethality Analysis Directorate (SLAD), Aberdeen Proving Grounds, MD, May 29-June 1, 2012

- National Academies Panel on Survivability and Lethality Analysis, Survivability and Lethality Analysis Directorate (SLAD), White Sands, NM, August 2-5, 2011
- National Research Council (NRC) Review of ARL Autonomous Systems, ARL Vehicle Tech Directorate (VTD), Aberdeen Proving Grounds, MD, July 11-13, 2011

June, 2006	NSF Proposal Review Panelist, Power, Control, and Adaptive Networks Program. Washington DC.
October, 2006	National Academy of Engineering, Consulting, "Development of Research and Research Capacity Building Assessment Metrics for NSF." Washington DC. 2006-2007.
December, 2005	National Academy of Engineering, Committee on Engineering Education. Washington DC. Appointment: 2005-2009.
January, 2002	NSF Proposal Review Panelist, Education and Human Resources, HBCU Program. Washington DC.
March, 2001	Committee on Science, Engineering, and Public Policy (COSEPUP) Postdoctoral Convocation Guest, National Academy of Sciences. Washington DC.
December, 2000	NSF Proposal Review Panelist, Education and Human Resources, HBCU Program. Washington DC.
January, 2000	Honeywell H.W. Sweatt Awards Committee, Eminent Engineering Authority. Phoenix, AZ.
January, 1999	Honeywell H.W. Sweatt Awards Committee, Eminent Engineering Authority. Phoenix, AZ.
January, 1998	Honeywell H.W. Sweatt Awards Committee, Eminent Engineering Authority. Phoenix, AZ.
January, 1998	NSF Proposal Review Panelist, Dynamical Systems and Control. Washington DC.
January, 1997	NSF Proposal Review Panelist, Instrumentation and Laboratory Improvement. Washington DC.
1994 -1997	Member of AIAA Technical Committee. Guidance, Navigation, and Control.
June, 1994	NSF Proposal Review Panelist, Dynamical Systems and Control. Washington DC.

### **Paper Reviewer**

1998 - 2005	Associate Editor, Conference Editorial Board, IEEE Control System Society.
1990 - present	IEEE Transactions on Automatic Control. Automatica. Systems and Control Letters. IEEE Control Systems Magazine. AIAA Journal of Guidance, Control, and Dynamics. SIMULATION.  American Control Conference. IEEE Conference on Decision and Control. AIAA Guidance, Navigation, and Control Conference.

### **International/National Conference Service**

August, 2013	Session Co-Chair. "Aircraft GNC: Controls V." <i>2013 GNC Conference</i> , Boston, MA.
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July, 2007                    Session Chair. “Air Vehicle Systems Control.”  
*2007 American Control Conference*, New York, NY.

December, 2006              Session Co-Chair. “Robust Control Applications.”  
*45<sup>th</sup> IEEE Conference on Decision and Control*, San Diego, CA.

June, 2005                    Session Chair. “Optimal Control Theory.”  
*2005 American Control Conference*, Portland, OR.

December, 2004              Session Co-Chair. “Control of Rotorcraft Systems.”  
*43<sup>rd</sup> IEEE Conference on Decision and Control*, Bahamas.

May, 2004                    Member of International Program Committee.  
*2004 IASTED Modeling and Simulation Conference*, Marina del Rey, CA.

June, 2003                    Session Chair. “Multirate Systems.”  
*2003 American Control Conference*, Denver, CO.

October, 2001                Session Chair. “Collaborative Research with Industry.”  
*NSF-CMS Workshop for Advancement and Retention of Underrepresented Engineering Educators*, NSF, Arlington, VA.

October, 2001                Session Chair. “Collaborative Research with University Faculty.”  
*NSF-CMS Workshop for Advancement and Retention of Underrepresented Engineering Educators*, NSF, Arlington, VA.

March, 2001                    IEEE Week Organizer. *Technology Trends, Startups, and Career Opportunities*.  
Arizona State University, Tempe, AZ.

January, 2001                NSF MGE@MSA Workshop Organizer, Speaker, and Facilitator.  
*First MGE@MSA Mentoring Institute*, Arizona State University, Tempe, AZ.

January, 2001                Invited Session Organizer. “FAME Research Activity at Arizona State University.”  
*International Conference on Simulation in Engineering Education*, Phoenix, AZ.

January, 2001                Invited Session Organizer. “MoSART Research Activity at Arizona State University.”  
*International Conference on Simulation in Engineering Education*, Phoenix, AZ.

January, 2001                Session Chair. “Neural Networks and Fuzzy Algorithms in Modeling and Simulation.”  
*International Conference on Simulation in Engineering Education*, Phoenix, AZ.

October, 2000                IEEE Week Organizer. *Technology Trends, Startups, and Career Opportunities*.  
Arizona State University, Tempe, AZ. Over 900 participants.

March, 2000                    IEEE Week Organizer. *Technology Trends, Startups, and Career Opportunities*.  
Arizona State University, Tempe, AZ. Over 700 participants.

September, 1999              Session Chair. “Mentoring of Junior Faculty.”  
*NSF-CMS Workshop for Advancement and Retention of Underrepresented Engineering Educators*, Washington, D.C.

September, 1999              Session Chair. “Interdisciplinary Research Proposals.”  
*NSF-CMS Workshop for Advancement and Retention of Underrepresented Engineering Educators*, Washington, D.C.

September, 1999              Session Chair. “Establishing Partnerships with Industry.”  
*NSF-CMS Workshop for Advancement and Retention of Underrepresented Engineering Educators*, Washington, D.C.

June, 1999                    Session Chair. “Quantitative Feedback Theory and Robust Control.”  
*1999 American Control Conference*, San Diego, CA.

June, 1999                    Session Co-Chair. “Control Applications.”  
*1999 American Control Conference*, San Diego, CA.

March, 1999	<u>Invited Session Organizer and Chair.</u> “ <i>MoSART-FAME: A Theme For Multi-disciplinary Curricular Reform.</i> ” 1999 <i>ASEE/PSW Conference</i> , Las Vegas, NV.
January, 1999	<u>Invited Session Organizer and Chair.</u> “ <i>MoSART.</i> ” 1999 <i>International Conference on Simulation in Engineering Education</i> , San Francisco, CA.
January, 1999	Member of International Program Committee. 1999 <i>International Conference on Simulation in Engineering Education</i> , San Francisco, CA.
June, 1997	<u>Invited Session Organizer and Chair.</u> American Control Conference, Albuquerque, NM. “Modeling and Control of Re-entrant Fabrication Lines.”
January, 1997	Session Chair. 1997 <i>International Conference on Simulation in Engineering Education</i> , Phoenix, AZ. “Simulation in Microelectronics.”
January, 1997	Session Chair. 1997 <i>International Conference on Simulation in Engineering Education</i> , Phoenix, AZ. “Simulation Applications in Engineering.”
January, 1997	Member of International Program Committee. 1997 <i>International Conference on Simulation in Engineering Education</i> , Phoenix, AZ.
June, 1995	<u>Invited Session Organizer and Chair.</u> American Control Conference, Seattle, WA. “Design of Missile Guidance and Control Systems.”
June, 1995	Session Chair. American Control Conference, Seattle, WA. “Delay Systems.”
July, 1994	Member of Program Committee. 1995 <i>American Control Conference</i> , Seattle, WA.
August, 1994	Session Co-organizer and Chair. AIAA Guidance, Navigation, and Control Conference, Scottsdale, AZ. “Missile Control and Estimation.”
June, 1994	<u>Invited Session Organizer and Chair.</u> American Control Conference, Baltimore, MD. “Performance Enhancement for Missile Guidance and Control Systems.”
June, 1993	Session Co-chair. American Control Conference, San Francisco, CA. “Applications of Stability Theory.”
December, 1992	Session Co-chair. 31 <sup>st</sup> IEEE Conference on Decision and Control, Tucson, AZ. “Applications of Robust Control.”
June, 1992	Session Chair. American Control Conference, Chicago, IL. “Infinite-Dimensional Systems.”

### **Textbook Reviewer**

September, 2003	Textbook Reviewer. McGraw Hill. W. Palm, <i>Introduction to MATLAB 6 for Engineers with MATLAB 6.5 Update.</i>
August, 2003	Textbook Reviewer. John Wiley & Sons. B.C. Kuo, <i>Automatic Control Systems</i> , 8th edition.
August, 2002	Textbook Reviewer. John Wiley & Sons. D. Irwin, <i>Basic Engineering Circuit Analysis</i> , 7th edition.
March, 2002	Textbook Reviewer. McGraw Hill. S.E. Lyshevski, <i>Engineering and Scientific Computation Using MATLAB.</i>
December, 2000	Textbook Reviewer. Addison Wesley. G.F. Franklin, J. D. Powell, and A. Emami-Naeini, <i>Feedback Control of Dynamic Systems.</i>
March, 1997	Textbook Reviewer. PWS Publishing Company. T.V. Nguyen, <i>Linear Electrical Engineering Analysis.</i>

March, 1994	Textbook Reviewer. Prentice Hall Publishing Company. J.B. Burl, <i>Linear Optimal Estimation and Control</i> .
May, 1993	Textbook Reviewer. McGraw Hill Publishing Company. J.J. D'Azzo and C.H. Houpis, <i>Linear Control System Analysis and Design: Conventional and Modern</i> .
March, 1988	Galley Proof Reviewer. Massachusetts Institute of Technology. A.V. Oppenheim and R.W. Schaffer, <i>Discrete-Time Signal Processing</i> , Prentice Hall Publishing Company, 1989. Mentioned in acknowledgements.

### Expert Consulting

2004-2005	Worked with researchers at NASA Ames Research Center (ARC) on each of the following: (1) NASA's Personal Satellite Assistant (PSA), (2) Jupiter Icy Moon Orbiter (JIMO) sensor placement and flexible mode control, (3) health monitoring and system identification for rotorcraft, (4) rapid prototyping of FPGA-based embedded with health monitoring and fault tolerant control capabilities, (5) ASU's Universal HM-C4 Science Engine for future NASA missions.
1998-2000	Provided Honeywell Air Transport Systems with dynamic robustness studies for high speed civil transport (HSCT), using Boeing autopilot design, toward the design of an automatic landing system.
February, 1995	Advised science reporter Mike Warren of Channel 3 News regarding physics and control issues associated with the Space Shuttle-Mir Spacecraft docking mission scheduled for June 1995 (2/8/95).
April, 2000	Interviewed by Channel 15 news regarding a US Marine Corps MV-22 Osprey tiltrotor aircraft crash (4/8/00) near Tucson, Arizona. The MV-22 was conducting night maneuvers using night vision goggles. All 19 aboard perished. A decision is due in October on moving from field testing to full-scale production. The current plan is for the Marines to buy 360 Ospreys, the Navy 48 and the Air Force 50. The Marines are counting on the Osprey to replace its aging fleet of CH-46 Sea Knight helicopters for troop transport and sea-to-shore insertion of assault troops.
1990-pres	Participated in the ASU Speakers Bureau; ASU Experts and Media Guide.

### Graduate Fellowship Acquisition

2013-2016	NSF Fellowship, Justin Echols, EE, \$150K.
2013-2015	GEM Fellowship, Michael J. Thompson, MAE, \$18K.
2007-2010	NASA GSRP Fellowship, Jeffrey J. Dickeson, EE, NNX07AU21H, "Modeling, Uncertainty Characterization, and Control of Hypersonic Waveriders with Significant Aero-Thermo-Elastic Propulsion Interactions," \$90K. Completed PhD in EE under my supervision.
2006-2007	GEM Graduate Fellowship, Jose Benavides, \$10K. Completed MS in EE under my supervision (2009).
2004-2006	NSF LSAMP Bridge to the Doctorate Fellowship, Daniel Cartagena, EE, \$73.339K.
2005-2007	NSF-LSAMP Fellow, Miguel F. Garcia. Completed MS in EE under my supervision (2007).
2001	ARCS Scholarship, Richard P. Metzger. Completed MS in EE under my supervision (2000).

2000	NSF Fellowship, John S. Koenig. Completed MS in EE under my supervision (2002).
1998	GEM Fellowship, Daniel Cartagena. Completed MS in EE under my supervision (2000).
1993	GEM Doctoral Fellowship, Delano Carter. Completed Ph.D. in EE under my supervision (1998).
1992	IBM Graduate Fellowship for Mr. Shawn Mahloch, IBM - Tucson, AZ. Completed MS in EE under my supervision (1993).

### **National Minority Organization Service**

2000-2006	MGE@MSA. NSF sponsored program. Organizing doctoral mentoring workshops for faculty in our region (i.e. Arizona, Colorado, Nevada, New Mexico, Utah). First workshop: ASU 1/12/2001, Second: UNM 11/9/2002, Third: ASU 3/27/2002, Fourth: UUtah 9/12/2002, Fifth: ASU 4/1/2003.
1995	Appeared in 1995 Edition of ECSEL/Engineering Coalition Directory of Minority Engineering Faculty.
1994-present	Coalition to Increase Minority Degrees (CIMD); now Western Alliance to Expand Student Opportunities (WAESO), Undergraduate student research project director.
1994	Appeared on front cover of "Toward the Achievement of A Diverse Scientific and Technological Workforce," an NSF/AMP publication.
1994-present	Alliance for Minority Participation (AMP).
1993-present	American Council on Education (ACE) Rapid Response Network Participant, Office of Minorities in Higher Education, Division of Governmental Relations.

### **Academic Success and Professional Development Scholarship Program**

2000-present	Director, <i>Academic Success and Professional Development Student-Centered Research-Mentoring Scholarship Program</i> , Fulton Schools of Engineering: School of Electrical, Computer and Energy Engineering (ECEE), Supported by NSF S-STEM, CSEMS, and STEP programs and industry.
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### **Minority Student Mentoring**

1994-present	Mentoring of ASU SHPE/MAES Branch Students. Advisor to Seamless Web Minority Students. <i>MoSART-FAME</i> Research and Mentoring Program.
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### **Other**

2002-2005	Principal Graduate Recruiter for Electrical Engineering
1997-present	ASU IEEE Student Branch Faculty Advisor and Mentor
1990-present	Undergraduate project supervisor. Undergraduate and graduate academic advisor. Undergraduate and graduate thesis supervisor.

## 7 University Committee Service

### College Committees

- CEAS Computer Task Force, Member, 1990–1991.
- CEAS Affirmative Action Committee, Member, 1991.
- CEAS Engineering Mechanics Committee, Member, 1993–1996.
- CEAS Teaching Recognition Committee, Fall, Member, 1993, 1994.
- CEAS Minority Engineering Program Advisory Council, Member, 1995–2005.
- CEAS Student Affairs Committee, Member, 1998–2002.
- CEAS Community College Module Development Initiative, 2000–2002.
- CEAS-CFA Faculty Search Committee, Member, 2001–2002.

### Department Committees

- EEE Systems Area Committee, Member, Fall 1990–present.
- EEE Senior Faculty Search Committee, Member, Fall 1990.
- EEE PhD Admissions: Responsible for Controls Area, 1990–2008.
- EEE MSE Exam Administrator for Controls Area, 1997–2008.
- EEE Faculty Search Committee (Packaging), Member, Fall 1994, Spring 1995.
- EEE/MAT Faculty Search Committee (Large Systems), Member, 1997, Spring 1998.
- EEE Personnel Committee, Member, 1997–2003.
- EEE Graduate Committee, Member, 1993–2003.

### Center Affiliations

- Center for System Science and Engineering, 1990–2003.
- Aerospace Research Center, 1990–1996.
- Center for Solid State, 1993–2000.
- Center for the Innovation In Engineering Education, 1994–1999.
- Center for Research on Education in Science, Engineering, and Technology (CRESMET), 1999–2005.
- Hispanic Research Center (HRC), 1994–present.
- Institute for the Study in the Arts (ISA), 1998–2008.

### Other Service

- Director, *Academic Success and Professional Development Research-Mentoring Scholarship Program*, EE, 2000–present. Fulton Schools of Engineering: School of Electrical, Computer and Energy Engineering (ECEE), Supported by NSF S-STEM, CSEMS, and STEP programs and industry. Have led Engineering Industrial Advisory Board since 5-2013.
- Fulton Undergraduate Research Initiative (FURI) Project Supervision, 2004–present.
- Fulton School of Engineering Hispanic Community Outreach Mission Committee, 2003–2005.
- EEE Affirmative Action Representative, 1990–2003.
- EEE Western Exchange Representative, 1991–2003.
- EEE Minority Recruiter, 1991–present.
- One-to-One Program Facilitator <sup>4</sup> 1991–1996.
- CEAS Faculty Educational Improvement Grant-In-Aid (FEIGIA) Program Reviewer, 1997.

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<sup>4</sup>Counselor to ASU undergraduate minorities in science and engineering,