Raktim Bhattacharya

CONTACT
INFORMATION

727C H.R. Bright Building, 3141 TAMU,
Department of Aerospace Engineering,
Texas A&M University,
College Station, TX, 77843.

Voice: (979) 862-2914
Fax: (979) 845-6051
Email: raktim@tamu.edu
Web: uq.tamu.edu
uqLab.github.io

RESEARCH
INTERESTS

Uncertainty quantification in dynamics and control, control theory, flight control, optimization, aerospace systems design, robotics, and large-scale computations.

EMPLOYMENT
HISTORY

Associate Professor, Aerospace Engineering, Texas A&M University   **Sep, 2011 - Present**
Assistant Professor, Aerospace Engineering, Texas A&M University   **Oct, 2005 - Sep 2011**

EDUCATION

University of Minnesota, Minneapolis, Minnesota, USA
   Ph.D., Aerospace Engineering   **Jan 2001 - Jan 2003**
   Advisor: Gary. J. Balas.

   M.S., Aerospace Engineering   **Aug 1997 - Dec 2000**
   Advisor: Gary. J. Balas.

Indian Institute of Technology, Kharagpur, India
   B.Tech, Aerospace Engineering   **Aug 1992 - May 1996**

ACADEMIC
EXPERIENCE

California Institute of Technology, Pasadena, California, USA
Postdoctoral Scholar with Dr. Richard M.Murray   **Jan, 2003 - Sep, 2004**

- New computational tools for nonlinear trajectory generation for UAVs, exploiting differential flatness in the dynamics.
- New theoretical work on cooperative control problems for robotic networks, using ideas from set invariance theory and monotone dynamical systems.
- Design and analysis of hypersonic flight control systems for atmospheric reentry vehicles, in collaboration with JPL.

University of Minnesota, Minneapolis, Minnesota, USA
Graduate Research Assistant   **Sep, 1997 - Dec, 2002**

- Nonlinear receding horizon control of F16 aircraft model.
- Implementation of control algorithms in a real-time CORBA framework, developed by BOEING under Software Enabled Control program of DARPA.
- New theory on anytime control algorithms that provide robustness with respect to uncertainty in available computational time.

INDUSTRY
EXPERIENCE

United Technologies Research Center, East Hartford, Connecticut, USA
Research Scientist   **Oct, 2004 - Oct, 2005**

- Technical lead for developing a new process for rigorous embedded system design for United Technologies (UTC) business units.
- Process was developed in collaboration with UC Berkeley & PARADES, Italy.
- Benefits of the new design paradigm was validated in an actual elevator system at the Otis test tower facility in Bristol, Connecticut.

Usha Beltron Electronic Software Ltd., Kolkata, West Bengal, India
Junior Engineer   **May, 1996 - Jul, 1997**
- Developed software for adaptive mesh generation for India's Light Combat Aircraft (LCA).
- Developed computational fluid dynamics code to capture transient forces during store separation in transonic flow.
- Collaborated with Aerodynamic Development Agency (ADA), Bangalore, India.

Funded Research **Current**

1. **NASA:** Tensegrity Approaches to In-Space Construction of 1g Growable Habitat – $500K; 2016-2018; PI: Bob Skleton, Co-PIs: Raktim Bhattacharya, Joel Sercel, Anthony Longman, NASA NIAC Phase II.

2. **AFOSR:** Cloud Computing Based Robust Space Situational Awareness – $670K, Jul 2015 - Jun 2018, Raktim Bhattacharya (PI, TAMU), Bani Mallick (Co-PI, TAMU).

3. **NSF:** XPS: FULL: DSD: Asynchronous PDE Algorithms for Turbulent Flows at Exascale – $850K, Aug 2014-Aug 2017; Diego Donzis (PI, TAMU), Raktim Bhattacharya (Co-PI, TAMU), Sharath Girimaji (Co-PI), Lawrence Rauchwerger (Co-PI), Nancy Amato (Co-PI).

Completed

1. **UT Austin:** Systems Engineering Design Course Curriculum Development – $100,000; Aug, 2013 - Dec, 2015; **Subcontracted by UT Austin**, Raktim Bhattacharya (Co-PI, TAMU).

2. **NSF:** CCF: SHF: EAGER: Collaborative: Asynchronous Algorithms for Exascale Computing Systems – $100K, Sep 2013-Aug 2014; Raktim Bhattacharya (PI, TAMU), Diego Donzis (Co-PI, TAMU), Jonathan Rogers (Co-PI, G.Tech).

3. **NSF:** Uncertainty Management in Real-Time Embedded Control Systems – $232,447; Jul, 2010 - Jul, 2013; Raktim Bhattacharya (PI, TAMU).

4. **BOEING:** Self-Aware Autonomous Swarms and Land, Air & Space Robotics (LASR) Lab Collaboration – $5,000; Nov, 2009 - Oct, 2010; Raktim Bhattacharya (Co-PI, TAMU).

5. **NASA:** Beyond Monte-Carlo - Statistical Verification and Validation of Space Systems – $100,000; Jun, 2009 - May, 2010; Raktim Bhattacharya (PI, TAMU).

6. **Optimal Synthesis Inc.:** Simulation Evaluation of Nonlinear Flight Control System and Air Traffic Management Systems – $110,000; Feb, 2008 - Sep, 2008; Raktim Bhattacharya (PI, TAMU).

7. **NSF:** Design Of Robust & Energy Efficient Cyber-Physical Systems Using Dynamical Systems and Control Theory – $100,000; Aug, 2007 - Jul, 2009; Raktim Bhattacharya, (PI, TAMU), Rabi Mahapatra (TAMU), Prashant Mehta (UIUC).

8. **NASA:** Robust Adaptive Real-Time 6DOF Trajectory Generation for Atmospheric Reentry Vehicles – $532,206; Nov, 2006 - Oct, 2010; Raktim Bhattacharya, (TAMU, PI), Srinivas Rao Vadali (TAMU).

Student Advising **Current**

1. Shao-Chen Hsu (Ph.D.)
2. Niladri Das (Ph.D.)
3. Aritra Biswas (Ph.D.)
4. Sun Soo Kim (Ph.D.)
5. Vedang Deshpande (Ph.D.)
6. Vaishnav Tadiparthi (Ph.D.)
7. Noah Lawrence (M.S.)

Graduated Ph.D.
1. Kooktae Lee, 2015 – Assistant professor New Mexico Tech, Mechanical.
2. Abhishek Halder, 2014 – Assistant Professor UC Santa Cruz, Mathematics.
3. Zhenchun Xia, 2012 – Autonomous Vehicle Systems Engineer, Autoliv.
4. Parikshit Dutta, 2011 – Research Scientist, Optimal Synthesis Inc.
5. Baljeet Singh, 2010 – Senior Algorithms Engineer, Cymer.
6. James Fisher, 2008 – Senior Systems Engineering at Raytheon Missile Systems.

Graduated M.S.
1. Jaewon Kim, 2017 – PhD Student at TAMU, EE.
2. Radhika Saraf, 2017 – PhD Student at TAMU, EE.
3. Justin Barnes, 2016 – Engineer at Genesys Aerosystems.
4. Michael Young, 2016 – PhD Student at Northwestern University.
5. Kevin Kim, 2013.
6. Eric Wendel, 2012 – Dynamic Systems Mission Analyst, Draper.
7. Luis Arturo Ruiz Brito, 2009.
8. Avinash Prabhakar, 2008 – Algorithm Engineer at Autoliv.
9. Amos Kim, 2007 – Completions Engineer at Chevron.

Post Doctoral Scholar
1. Kooktae Lee, 2015 – Assistant professor New Mexico Tech, Mechanical.
2. Prasenjit Sengupta, 2007-2008 – Scientist at NIO.

<small>TEACHING</small>
Graduate
1. AERO 631 – Model Predictive Control for Aerospace Systems
2. AERO 632 – Design of Advanced Flight Control Systems - Theory & Application
3. AERO 689 – Convex Analysis & Optimization

Undergraduate
1. AERO 305 – Aero Engr Lab II
2. AERO 310 – Aerospace Dynamics
3. AERO 220 – Numerical Methods
4. AERO 401/402 – Aerospace Vehicle Design
5. AERO 321 – Dynamics of Aerospace Vehicles
6. AERO 422 – Active Control for Aerospace Vehicles

<small>PROFESSIONAL
SERVICE</small>
- Associate Editor – IEEE American Control Conference, 2013, 2014, 2015.
- Reviewer for conferences and journals (IEEE, AIAA, ASME)
- NSF Review Panelist, NASA postdoctoral review panelist
- Organized workshops in IEEE ACC and IEEE CDC on Uncertainty Quantification
- Consulting work in stochastic optimization, and flight control system design & analysis with WNS (`www.wns.com`).
- Expert Panelist for Uncertainty Quantification in European Air Traffic Control (The Innaxis Foundation & Research Institute).

TEXAS A&M UNIVERSITY SERVICE	• Member – EnMed Advanced Interventional Technologies Subcommittee: Advanced interventional technologies (including robotics, computational surgical planning, lasers, and devices) (2016 – Present) • Organizational Chair – Texas A&M Workshop on Unmanned Aircraft System Traffic Management (UTM) (2016) • Organizational Chair – Texas Systems Day (2014 – Present) • Group Leader – Systems Engineering/IDEAS Group, Aerospace Engineering, Texas A&M (2013 – 2016) • Aerospace Engg. Representative – COE Research Council (2014 – 2015) • Aerospace Engg. Representative – COE Systems Engineering Curriculum (2013 – 2015) • Aerospace Engg. Representative & Chair – COE Institute for Cyber Physical Engineering Systems (2014 – 2017) • Aerospace Engg. Representative – COE Institute for Industry and Commercialization Council (2014 – 2016)
HONORS AND AWARDS	• IEEE Senior Member (2015 – Present) • AIAA Associate Fellow (2016– Present) • First Prize MACH-1 Contest organized by AIAA GNC Technical Committee & Mathworks Corporation. A Texas A&M University team of graduate and professors in the Department of Aerospace Engineering won first place in the inaugural Model-based Aerospace CHallenge #1 (MACH-1). Award was made on Aug 2008, Honolulu, Hawaii at the AIAA GNC Conference. • Best Paper of the Session - Coauthored paper, with graduate student James Fisher, won the best session paper award in IEEE American Control Conference, 2008. • Great Job Award from United Technologies Research Center for developing a process for reliable embedded software design, Sep 2005. • Graduate Student Fellowship from the Dept. of Aerospace Engineering & Mechanics, University of Minnesota, Sep 97 – May 98.
PATENTS	1. **Maxillofacial Rehabilitation Device**, US Application No. 62/194,602; Filed July 20, 2015; WO Application No. PCT/US16/43095; Filed July 20, 2016.

Journal Under Review

1. K. Lee, R. Bhattacharya, On the Convergence of Asynchronous Consensus in Discrete-time Multi-agent Systems with Fixed and Switching Topologies. (IEEE TAC, 2016)

2. K. Lee, R. Bhattacharya, Design of Resource-Optimal Switching for Resource-Constrained Dynamical Systems. (Journal of Intelligent & Robotic Systems, 2016)

3. K. Lee, A. Halder, and R. Bhattacharya, A new framework for Mean Square Stability of Stochastic Jump Linear Systems via Optimal Transport. (Journal of Mathematical Analysis and Applications, 2015).

4. S. C. Hsu, R. Bhattacharya, Design of Linear Parameter Varying Quadratic Regulator in Polynomial Chaos Framework. (Automatica, 2017)

5. R. Saraf, R. Bhattacharya, R. Skelton, Robust $\mathcal{H}_2$ Optimal Sensing Architecture. (IEEE TAC, 2017)

6. N. Das, R. Bhattacharya, Optimal Transport Interpretation of Kalman Filtering (SIAM UQ, 2017)

7. N. Das, R. P. Ghosh, N. Guha, R. Bhattacharya, B. Mallick, Optimal Transport Based Tracking of Space Objects in Cylindrical Manifolds. (Journal of Astronautical Sciences, 2017)

8. A. Biswas, R. Bhattacharya, R. Skelton, A Convex Optimization Based Design of Tensegrity Based Robotic Arm. (Robotica, 2017)

9. R. Bhattacharya, D. Donzis, K. Kumari, Integrated Convex Optimization Based Synthesis of Discrete Schemes for Linear Partial Differential Equations, (JCP, 2017)

Journal Published

1. P. Dutta, A.Halder, R. Bhattacharya, Nonlinear Estimation with Perron-Frobenius Operator and Karhunen-Loeve Expansion, **IEEE Transactions on Aerospace and Electronic Systems**, 2015.

2. K. Lee, R. Bhattacharya, Stability Analysis of Large-Scale Distributed Networked Control Systems with Random Communication Delays: A Switched System Approach, **System & Control Letters**, 2015.

3. A. Halder, K. Lee, and R. Bhattacharya, Optimal Transport Approach for Probabilistic Robustness Analysis of F-16 Controllers, **AIAA Journal of Guidance, Control, and Dynamics**, 2015.

4. K. Lee, A. Halder, R. Bhattacharya, Performance and Robustness Analysis of Stochastic Jump Linear Systems Using Wasserstein Metric, **Automatica**, 2014

5. A. Halder, R. Bhattacharya, Probabilistic Model Validation for Uncertain Nonlinear Systems. **Automatica**, 2014.

6. P. Dutta, R. Bhattacharya, Hypersonic State and Parameter Estimation Using Frobenius-Perron Operator, **AIAA Journal of Guidance, Control, and Dynamics**, Vol 34, No. 2, 2011.

7. P. Dutta, R. Bhattacharya, Nonlinear Estimation of Hypersonic State Trajectories in Bayesian Framework with Polynomial Chaos, **AIAA Journal of Guidance, Control, and Dynamics**, Vol 33, No. 6(1765-1778), 2011.

8. A.Halder, R. Bhattacharya, Dispersion Analysis in Hypersonic Flight During Planetary Entry Using Stochastic Liouville Equation, **Journal of Guidance, Control and Dynamics**, Vol. 34, No. 2, pp. 459474, 2011.

9. J. Fisher, R. Bhattacharya, Optimal Trajectory Generation with Probabilistic System Uncertainty Using Polynomial Chaos, **ASME Journal of Dynamic Systems, Measurement and Control**, Vol 133, Issue 1, Jan 2011.

10. A. Prabhakar, J. Fisher, R. Bhattacharya, Polynomial Chaos Based Analysis of Probabilistic Uncertainty in Hypersonic Flight Dynamics - **AIAA Journal of Guidance, Control, and Dynamics**, Vol.33 No.1 (222-234), 2010.

11. P. Dutta, R. Bhattacharya, S. Chakravorty, Air-Traffic Control Using Ground-Delays and Rerouting of Flights - **AIAA Journal of Aerospace Computing, Information, and Communication**, Vol. 6, December 2009.

12. J. Fisher, R. Bhattacharya, Linear Quadratic Regulation of Systems with Stochastic Parameter Uncertainties - Volume 45, Issue 12, **Automatica**, 2009.

13. B. Singh, S. R. Vadali, R. Bhattacharya, Verification of Optimality and Costate Estimation Using Hilbert Space Projection - **AIAA Journal of Guidance, Control, and Dynamics** Vol.32, No. 4, 2009.

14. S. H. Kim, R. Bhattacharya, Motion Planning in Obstacle Rich Environments - **AIAA Journal of Aerospace Computing, Information, and Communication** (1542-9423) 2009 vol. 6 no. 7.

15. J. Fisher, R. Bhattacharya, Analysis of Partial Stability Problems Using Sum of Squares Techniques - **Automatica** Volume 45, Issue 3, March 2009, Pages 724-730.

16. R. Bhattacharya, J. Fung, A. Tiwari, R. M. Murray, Cone Invariance and Rendezvous of Multiple Agents - **Journal of Aerospace Engineering**, Sep 2009, Vol 223, No. G6.

17. R. Bhattacharya, G. J. Balas, Control in Computationally Constrained Environments - **IEEE Control Systems Technology**, Volume 17, Issue 3, 2009.

18. R. Bhattacharya, G. J. Balas, Anytime Control Algorithm: Model Reduction Approach, **Journal of Guidance, Control, and Dynamics**, Vol. 27, No.5, pp. 767-776, 2004.

19. R. Bhattacharya, G. J. Balas, M. Alpay Kaya, A. Packard, Nonlinear Receding Horizon Control of an F-16 Aircraft , **Journal of Guidance, Control, and Dynamics**, Vol. 25, No. 5, pp. 924-931, 2002.

Conference
1. N. Das, R. Bhattacharya, Sparse Sensing Architecture for Kalman Filtering with Guaranteed Error Bound, 1st IAA Conference on Space Situational Awareness (ICSSA), 2017.

2. R. Saraf, R. Bhattacharya, R. Skelton, $\mathcal{H}_2$ Optimal Sensing Architecture, ACC 2017.

3. S.C. Hsu, R. Bhattacharya, Design of Stochastic Collocation Based Linear Parameter Varying Quadratic Regulator, ACC 2017.

4. K. Lee, R. Bhattacharya, On Relaxed Synchronization Strategy for Parallel Iterative Numerical Algorithms, ACC 2016.

5. K. Lee, R. Bhattacharya, J. Dass, V. Sakuru, and R. Mahapatra, A Relaxed Synchronization Approach for Solving Parallel Quadratic Programming Problems with Guaranteed Convergence, IPDPS, 2016.

6. R. Bhattacharya, A Polynomial Chaos Framework for Designing Linear Parameter Varying Control Systems, ACC 2015.

7. K. Lee, R. Bhattacharya, and V. Gupta, A Switched Dynamical System Framework for Analysis of Massively Parallel Asynchronous Numerical Algorithms, ACC , 2015.

8. R. Bhattacharya, Robust State Feedback Control Design with Probabilistic System Parameters, CDC, Los Angeles, 2014.

9. A. Halder, K. Lee, R. Bhattacharya, A Dynamical System Pair with Identical First Two Moments But Different Probability Densities, CDC, Los Angeles, 2014.

10. K. Lee, R. Bhattacharya, Optimal Switching Synthesis for Jump Linear Systems with Gaussian Initial State Uncertainty, ASME Dynamic Systems and Control Conference (DSCC), 2014.

11. A. Halder, R. Bhattacharya, Geodesic Density Tracking with Applications to Data Driven Modeling, ACC, 2014.

12. K. Lee, A. Halder, R. Bhattacharya, Probabilistic Robustness Analysis of Stochastic Jump Linear Systems, ACC, 2014.

13. A. Halder, R. Bhattacharya, Frequency Domain Model Validation in Wasserstein Metric, ACC 2013

14. A. Halder, K. Lee, R. Bhattacharya, Probabilistic Robustness Analysis of F- 16 Controller Performance: An Optimal Transport Approach, ACC 2013

15. P. Dutta, A. Halder and R. Bhattacharya, Nonlinear Filtering with Transfer Operator, ACC 2013.

16. R. Bhattacharya, J. Fisher, Linear Receding Horizon Control with Probabilistic System Parameters, 7th IFAC Symposium on Robust Control Design, Aalborg, Denmark, June 2012.

17. P. Dutta, A. Halder, R. Bhattacharya, Uncertainty Quantification for Stochastic Nonlinear Systems using Perron-Frobenius Operator and Karhunen-Loeve Expansion. IEEE Multi-Conference on Systems and Control, Dubrovnik, Oct 2012.

18. Zhenchun Xia, G.H.Huff, J.F.Chamberland, H.Pfister and R. Bhattacharya, Crystallographic-Based Antenna Configurations for DOA Estimation, USNC/URSI Nat. Radio Sci. Mtg., Boulder, CO, 2012.

19. Zhenchun Xia, G.H.Huff, J.F.Chamberland, H.Pfister and R. Bhattacharya, DOA Estimation Using Canonical and Crystallographic Volumetric Element Configurations. Submitted EuCAP, Czech Republic, 2012.

20. A. Halder, R. Bhattacharya, Model Validation: A Probabilistic Formulation, IEEE Conference on Decision and Control, 2011.

21. P. Dutta, R. Bhattacharya, Nonlinear Estimation of Hypersonic Flight Using Polynomial Chaos, AIAA GNC, 2010.

22. A. Halder, R. Bhattacharya, Beyond Monte Carlo: A Computational Framework for Uncertainty Propagation in Planetary Entry, Descent and Landing, AIAA GNC 2010.

23. P. Dutta, R. Bhattacharya, Nonlinear Estimation with Polynomial Chaos and Higher Order Moment Updates, IEEE American Control Conference 2010.

24. B. Singh, R. Bhattacharya, Direct Optimal Control and Costate Estimation Using Least Square Method, IEEE American Control Conference 2010.

25. Y. Zhu, E. Westbrook, J. Inoue, A. Chapoutot, C. Salama, M. Peralta, T. Martin, W. Taha, M. O'Malley, R. Cartwright, A. Ames, R. Bhattacharya, Mathematical Equations as Executable Models of Mechanical Systems, ACM/IEEE First International Conference on Cyber-Physical Systems, 2010.

26. P. Dutta, R. Bhattacharya, S. Chakravorty, Robust Air-Traffic Control Using Ground-Delays and Rerouting of Flights, AIAA GNC, 2009.

27. M. Marwaha, B. Singh, J. Valasek, R. Bhattacharya, Integrated Guidance and Fault Tolerant Adaptive Control for Mars Entry Vehicle - AIAA GNC, 2009.

28. R. Bhattacharya, J. Valasek, B. Singh, S. Johnson, J. Jackson, M. Marwaha, On Modeling and Robust Control of ARES, AIAA GNC 2008.

29. J. Jackson, R. Bhattacharya and T. Strganac, Modelling and Suboptimal Trajectory Generation for a Symmetric Flapping Wing Vehicle - AIAA GNC 2008.

30. P. Sengupta, R. Bhattacharya, Uncertainty Analysis of Hypersonic Flight Using Multi-Resolution Markov Operators, AIAA GNC 2008.

31. A. Prabhakar, R. Bhattacharya, Analysis of Hypersonic Flight Dynamics with Probabilistic Uncertainty in System Parameters, AIAA GNC 2008.

32. B. Singh, R. Bhattacharya, Optimal Guidance of Hypersonic Vehicles Using B-Splines and Galerkin Projection, AIAA GNC 2008.

33. J. Fisher, R. Bhattacharya, On Stochastic LQR Design and Polynomial Chaos, IEEE American Control Conference, 2008.

34. J. Fisher, R. Bhattacharya, Stability Analysis of Stochastic Systems using Polynomial Chaos, IEEE American Control Conference, 2008.

35. U. Vaidya, R. Bhattacharya, Motion Planning Using Navigation Measure, IEEE American Control Conference, 2008.

36. J. Fisher, R. Bhattacharya, S. R. Vadali, Spacecraft Momentum Management and Attitude Control using a Receding Horizon Approach, AIAA GNC 2007.

37. S. H. Kim, R. Bhattacharya, Multi-Layer Approach for Motion Planning in Obstacle Rich Environments, AIAA GNC 2007.

38. B. Singh, R. Bhattacharya, Near Time Optimal Waypoint Tracking of a 3-DOF Model Helicopter, AIAA GNC 2007.

39. J. Fisher, R. Bhattacharya, Construction of Lyapunov Certificates for Partial Stability Problems Using Sum of Squares Techniques, IEEE American Control Conference ,2007.

40. M. Majji, R. Bhattacharya, J. L. Junkins, Dynamics and Control of a Ground Effect Transportation System, IEEE American Control Conference, 2007.

41. R. Bhattacharya, Feedback Generation in Rendezvous Problems Using Synthetic Dynamics, IEEE American Control Conference 2007.

42. R. Bhattacharya, P. Singla, Nonlinear Trajectory Generation Using Global-Local Approximations, IEEE Conference on Decision and Control, San Diego, 2006.

43. R. Bhattacharya, OPTRAGEN: A MATLAB Toolbox for Optimal Trajectory Generation, IEEE Conference on Decision and Control, San Diego, 2006.

44. Tamer Inanc, Raktim Bhattacharya, and Mehmet K. Muezzinoglu, Use of Parametric Approximation in RealTime Nonlinear Trajectory Generation, IEEE Conference on Decision and Control, San Diego, 2006.

45. R. Bhattacharya, S. Mijanovic , E. Scholte , A. Ferrari , M. Huzmezan, M. Lelic, M. Atalla, Rigorous Design of Real-Time Embedded Control Systems, IEEE Advanced Process Control Applications for Industry, Vancouver, May, 2006.

46. R. Bhattacharya, J. Fung, A. Tiwari, R. M. Murray, Ellipsoidal Cones and Rendezvous of Multiple Agents, IEEE Conference on Decision and Control, Bahamas, 2004.

47. A. Tiwari, J. Fung, R. Bhattacharya, R. M. Murray, Polyhedral Cone Invariance Applied to Rendezvous of Multiple Agents, IEEE Conference on Decision and Control, Bahamas, 2004.

48. A. Tiwari, J. Fung, J. M. Carson III, R. Bhattacharya, R. M. Murray, A Framework for Lyapunov Certificates for Multi-Vehicle Rendezvous Problems, IEEE Conference on Decision and Control, Bahamas, 2004.

49. R. Bhattacharya, G. J. Balas, An Algorithm for Computationally Efficient Digital Implementation of LTI Controllers, IEEE American Control Conference, June 2003.

50. R. Bhattacharya, G. J. Balas, Implementation of Control Algorithms in an Environment of Dynamically Scheduled CPU Time Using Balanced Truncation, AIAA GNC Conference, August 5-8, 2002.

51. R. Bhattacharya, G. J. Balas, M. Alpay Kaya, A. Packard, Nonlinear Receding Horizon Control of an F-16 Aircraft, American Control Conference, June 2001.