

Raktim Bhattacharya

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| CONTACT INFORMATION | 727C H.R. Bright Building, 3141 TAMU, Department of Aerospace Engineering, Texas A&M University, College Station, TX, 77843. | <i>Voice:</i> (979) 862-2914 <i>Fax:</i> (979) 845-6051 <i>Email:</i> raktim@tamu.edu <i>Web:</i> isrlab.github.io |
| RESEARCH INTERESTS | Uncertainty quantification, robust control and estimation, convex optimization, unmanned aerial systems, and large-scale computations. | |
| EMPLOYMENT HISTORY | Associate Professor , Aerospace Engineering, Texas A&M University Assistant Professor , Aerospace Engineering, Texas A&M University | Sep, 2011 – Present Oct, 2005 – Sep 2011 |
| EDUCATION | University of Minnesota , Minneapolis, Minnesota, USA Ph.D., Aerospace Engineering <i>Advisor: Gary. J. Balas.</i> M.S., Aerospace Engineering <i>Advisor: Gary. J. Balas.</i> Indian Institute of Technology , Kharagpur, India B.Tech, Aerospace Engineering | Jan 2001 – Jan 2003 Aug 1997 – Dec 2000 Aug 1992 – May 1996 |
| ACADEMIC EXPERIENCE | California Institute of Technology , Pasadena, California, USA <i>Postdoctoral Scholar with Dr. Richard M. Murray</i> <ul style="list-style-type: none">- 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 <i>Graduate Research Assistant</i> <ul style="list-style-type: none">- 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. | Jan, 2003 – Sep, 2004 Sep, 1997 – Dec, 2002 |
| INDUSTRY EXPERIENCE | United Technologies Research Center , East Hartford, Connecticut, USA <i>Research Scientist</i> <ul style="list-style-type: none">- 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 <i>Junior Engineer</i> | Oct, 2004 – Oct, 2005 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. **NSF:** Modeling, Analysis, and Diagnostics of High Strength-to-Weight Wind Turbine Blades Using Tensegrity Principles – \$375K, Sep 2018-Aug 2021; **Raktim Bhattacharya** (PI, TAMU), Robert Skelton (Co-PI).

Completed

1. **AFOSR:** Cloud Computing Based Robust Space Situational Awareness – \$670K, Jul 2015 – Dec 2018, **Raktim Bhattacharya** (PI, TAMU), Bani Mallick (Co-PI, TAMU).
2. **Intelligent Fusion Technology (STTR Phase I):** Adaptive Markov Inference Game Optimization (AMIGO) for Rapid Discovery of Evasive Satellite Behaviors – \$50K, Jun 2018-Dec 2018; **Raktim Bhattacharya** (PI, TAMU).
3. **NASA:** Tensegrity Approaches to In-Space Construction of 1g Growable Habitat – \$500K; 2016-2018; PI: Bob Skelton, Co-PIs: **Raktim Bhattacharya**, Joel Sercel, Anthony Longman, NASA NIAC Phase II.
4. **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).
5. **UT Austin:** Systems Engineering Design Course Curriculum Development – \$100,000; Aug, 2013 – Dec, 2015; **Subcontracted by UT Austin, Raktim Bhattacharya** (Co-PI, TAMU).
6. **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).
7. **NSF:** Uncertainty Management in Real-Time Embedded Control Systems – \$232,447; Jul, 2010 – Jul, 2013; **Raktim Bhattacharya** (PI, TAMU).
8. **BOEING:** Self-Aware Autonomous Swarms and Land, Air & Space Robotics (LASR) Lab Collaboration – \$5,000; Nov, 2009 – Oct, 2010; **Raktim Bhattacharya** (Co-PI, TAMU).
9. **NASA:** Beyond Monte-Carlo – Statistical Verification and Validation of Space Systems – \$100,000; Jun, 2009 – May, 2010; **Raktim Bhattacharya** (PI, TAMU).
10. **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).
11. **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).
12. **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. Sun Soo Kim (Ph.D.)
4. Vedang Deshpande (Ph.D.)

5. Vaishnav Tadiparthi (Ph.D.)
6. Vijay Kumar Samayamantula (M.S.)
7. Victoria Nagorski (Undergraduate Researcher)
8. Jillian Sears (Undergraduate Researcher)
9. Charles Conrad (Undergraduate Researcher)

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. Aritra Biswas, 2018 – Mathworks, Boston.
2. Jaewon Kim, 2017 – PhD Student at TAMU, EE.
3. Radhika Saraf, 2017 – PhD Student at TAMU, EE.
4. Justin Barnes, 2016 – Engineer at Genesys Aerosystems.
5. Michael Young, 2016 – PhD Student at Northwestern University.
6. Kevin Kim, 2013.
7. Eric Wendel, 2012 – Dynamic Systems Mission Analyst, Draper.
8. Luis Arturo Ruiz Brito, 2009.
9. Avinash Prabhakar, 2008 – Algorithm Engineer at Autoliv.
10. 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.

M.E. (Non Thesis)

1. Abhishek Bathla (AERO, Non Thesis) – Graduated 2007.
2. Ram Pantulu Baladandayu Thapani (AERO, Non Thesis) – Graduated 2008.
3. Sumit Pokhrel (AERO, Non Thesis) – Graduated 2015.
4. Brandon Simmons (MEEN, Non Thesis) – Graduated Spr 15.
5. Paul Edward (MEEN, Non Thesis) – Graduated Spr 15.
6. Noah Lawrence (AERO) – Graduated Fall 18.

Undergraduate Researcher

1. Tyler Bryant (Spr 15)
2. Scott Slaughter (Summer 2013).
3. Michael Young (Summer-Fall 2013) – Joined M.S. under me.
4. Emily Boster (2012-2013) – Summer Research at IIT Kanpur. **Won prestigious Astronaut Scholarship.**
5. Mario Botros (2012-2013)

6. Chris Bertagne (Summer 2012, REU, 3rd place in intra TAMU competition)
7. Zachary Sunberg (2011) – Joined Ph.D program at Stanford.
8. Ainsley Van Rooyen (LSAMP)
9. Luis Calixto (2007-2009)
10. Shalom Johnson (2007-2009)

TEACHING

Graduate

1. AERO 631 – Model Predictive Control for Aerospace Systems
2. AERO 632 – Design of Advanced Flight Control Systems – Theory & Application

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

PROFESSIONAL SERVICE

1. Associate Editor: IEEE American Control Conference, Portland Oregon, 2014.
2. Organizer, Workshop on Uncertainty Quantification, American Control Conference, 2014.
3. Organiser, Workshop on New Advances in Uncertainty Analysis and Estimation, American Control Conference, 2015,
4. Organizer: Invited session on Applications of Optimal Transport in Systems & Control, IEEE CDC 2014.
5. Associate Editor: IEEE American Control Conference, Portland Oregon, 2013.
6. Associate Editor: IEEE International Conference on Control Applications (CCA), San Antonio, TX, Sep 3-5, 2008.
7. Co-organizer: NSF Sponsored workshop and invited session on Smart Transportation Systems. 13th IEEE Real-Time and Embedded Systems Technology and Applications (RTAS) Symposium, Bellevue, WA. April 3rd – April 6th, 2007.
8. Co-organizer: Invited session on Trajectory Generation for Constrained Mechanical Systems, IEEE Conference on Decision and Control, Dec 2006, San Diego.
9. Co-organizer: Invited session on Trajectory Generation for Constrained Mechanical Systems, IEEE American Control Conference, June 2006, Minneapolis.
10. Reviewer for conferences and journals (IEEE, AIAA, ASME, SIAM) – about 5 papers per year from each society.
 - (a) Journal of Astronautical Sciences: 2018–Present
 - (b) Probabilistic Mechanics: 2017–Present
 - (c) SIAM Journal of Uncertainty Quantification: 2017 – Present
 - (d) ASME Journal of Control: 2005 – Present
 - (e) IEEE Transactions in Aerospace & Electronic Systems: 2005 – Present
 - (f) IEEE Transactions on Automatic Control: 2005 – Present
 - (g) Control Systems Technology: 2005 – Present
 - (h) Systems, Man, Cybernetics: 2005 – Present

- (i) Automatica: 2005 – Present
- (j) AIAA Journal of Guidance, Control and Dynamics: 2005 – Present
- (k) Journal of the Indian Institute of Science: 2005 – Present
- (l) IEEE Conferences: ACC and CDC, 2005 – current.

11. Reviewer for Books

- (a) Space Craft Trajectory Optimization – Elsevier, 2008.
- (b) Control Systems – Global Engineering Publishing Program at Cengage Learning (formerly Thomson Learning), 2009-2010.

12. NSF Review Panelist

13. NASA postdoctoral review panelist

CONSULTING

- 1. Consulting work in stochastic, optimization, and flight control system design & analysis with WNS (www.wns.com).
- 2. Expert Panelist for Uncertainty Quantification in European Air Traffic Control (The Innaxis Foundation & Research Institute).

TEXAS A&M
UNIVERSITY
SERVICE

- 1. Member – EnMed Advanced Interventional Technologies Subcommittee: Advanced interventional technologies (including robotics, computational surgical planning, lasers, and devices) (2016 – 2017)
- 2. Organizational Chair – Texas A&M Workshop on Unmanned Aircraft System Traffic Management (UTM) (2016)
- 3. Organizational Chair – Texas Systems Day (2014 – Present)
- 4. Group Leader – Systems Engineering/IDEAS Group, Aerospace Engineering, Texas A&M (2013 – 2016)
- 5. Aerospace Engg. Representative – COE Research Council (2014 – 2015)
- 6. Aerospace Engg. Representative – COE Systems Engineering Curriculum (2013 – 2015)
- 7. Aerospace Engg. Representative & Chair – COE Institute for Cyber Physical Engineering Systems (2014 – 2017)
- 8. Aerospace Engg. Representative – COE Institute for Industry and Commercialization Council (2014 – 2016)

COMMITTEE
MEMBER OF
STUDENTS AT
TEXAS A&M
UNIVERSITY
SERVICE

- 1. Yuling Shen – PHD in AERO
- 2. Ran Wang – PHD in AERO
- 3. Tyler Bryant – MS in AERO
- 4. Raman Goyal – PHD in AERO
- 5. Christopher Shelton – PHD in AERO
- 6. Komal Kumari – PHD in AERO
- 7. Haresh Karnan – MS in AERO
- 8. Xuan Yang – PHD in AERO
- 9. Benson Isaac – PHD in MEEN
- 10. Frank Arthurs – MS in AERO
- 11. Sangjin Han – PHD in ELEN
- 12. Deepika Kumari – MS in ELEN

13. Hansung Kim – PHD in OCEN
14. Riddhi Pratim Ghosh – PHD in STAT
15. Jyotikrishna Dass – PHD in CECN
16. Kaiyu Li – MS in MEEN
17. Gihyeob An – MS in ELEN
18. Bharadwaj Satchidanandan – PHD in ELEN
19. VNS Prithvi, Sakuru – MS in CPSC
20. Byungjun, Kim – MS in ELEN
21. Randy S., Kuhlmann – MS in ELEN
22. William T., Moss – MS in AERO
23. Weston R., Faber – PHD in AERO
24. Douglas I., Famularo – PHD in AERO
25. Carlos Lopez – MS in MEEN
26. Joel Barrera – PHD in ELEN
27. Mohammed F Hasan – MS in MEEN
28. Nathaniel Miller – MS in AERO
29. Rawand E. Jalal – PHD in MEEN
30. Brent D. Macomber – PHD in AERO
31. Zachary N. Sunberg – MS in AERO
32. Andrei Kolomenski – MS in AERO
33. Joel D. Barrera – MS in ELEN
34. Darkhan Alimzhanov – MS in AERO
35. Kenton Conrad Kirkpatrick – PHD in AERO
36. Sandip Kumar – PHD in AERO
37. Donghyurn Cho – PHD in AERO
38. John Thomas T. Graves – MS in AERO
39. Carolina I. Restrepo – PHD in AERO
40. Bong Su Koh – PHD in AERO
41. Lesley Anne Weitz – PHD in AERO
42. Roshmik Saha – PHD in AERO

INVITED TALKS

1. Real-Time predictive analytics in situational awareness problems, Texas A&M Workshop on Operational Data Science, Feb 11, 2019.
2. **Invited Speaker**, Real-Time Situational Awareness with Predictive Analytics, Drilling Uncertainty Prediction Technical Section, Annual Technical Conference, Society for Petroleum Engineers, Dallas Sep 23, 2018.
3. New Advances in Uncertainty Quantification & Mitigation in Aerospace Systems, Mechanical and Aerospace Engineering, Rutgers University, April 5, 2018.
4. **Plenary Speaker**, Computational Methods for Uncertainty Quantification in Space Situational Awareness, ICTACEM 2017, Dec 29th 2017, IIT Kharagpur, India.
5. New Opportunities, Challenges, and Design Approach for Future UAVs, Robert Bosch Center for Cyber-Physical Systems, Indian Institute of Science, Dec 8th, 2017.
6. Real-Time Predictive Analytics for Space Situational Awareness, Aerospace Engineering Department, Indian Institute of Science, Dec 8th, 2017.
7. **Guest of Honor**, A New Framework for Robust Control, Department of Aerospace Engineering, Indian Institute of Technology, Kharagpur, Jan 14th, 2017.
8. A Robotic Device for Maxillofacial Diagnosis & Therapy, Department seminar, TAMU College of Dentistry, Dallas, Mar 24th, 2017.
9. A New Framework for Robust Control, Department seminar, University of Houston, Mechanical & Aerospace Engineering, Houston, Sep 15th, 2016.
10. Stochastic Receding Horizon Control Using Polynomial Chaos Expansions, Department seminar, University of Florida, Mechanical & Aerospace Engineering, Nov 29th, 2011.
11. Stochastic Methods in Multi-disciplinary Optimization, BOEING, Seattle, Jan 20th, 2009.
12. Optimal Control with Probabilistic System Uncertainties, Vanderbilt University, Civil & Environmental Engineering, Jan 19th, 2009.
13. Optimal Control with Probabilistic System Uncertainties, Coordinated Science Laboratory, UIUC, Nov. 14th, 2007.
14. Robust Cyber Physical Systems, Mechanical Engineering, UC Berkeley, Mar 2007.
15. Design of Robust Cyber-Physical Systems, Caltech. Part of kickoff meeting for DARPA sponsored “Dynamic Network Analysis for Robust Uncertainty Management” program, Jan 2007.
16. Embedded Systems Development Process, United Technologies sponsored session, American Control Conference, Minneapolis, June 2006.
17. Robust Real-Time Control Systems, Aerospace Control & Guidance Systems Committee (SAE), Mar 1–3, 2006.

HONORS AND AWARDS

1. IEEE Senior Member (2015 – Present)
2. AIAA Associate Fellow (2016– Present)
3. 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.
4. Best Paper of the Session – Coauthored paper, with graduate student James Fisher, won the best session paper award in **IEEE American Control Conference**, 2008.
5. Great Job Award from United Technologies Research Center for developing a process for reliable embedded software design, Sep 2005.
6. 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.

PUBLICATIONS

IF = Impact Factor of Journals

Journal Under Review

1. N. Das, R. Bhattacharya, Optimal Sensing Precision for Multi-Rate Kalman Filters with Guaranteed Error Bounds, **Automatica**, Submitted Mar 2019.
2. K. Kumari, R. Bhattacharya, D. Donzis, Integrated Convex Optimization Based Synthesis of Discrete Schemes for Linear Partial Differential Equations, (first round of reviews done, **Journal of Computational Physics IF:2.864**, 2018).
3. S. C. Hsu, R. Bhattacharya, Design of Linear Parameter Varying Quadratic Regulator in Polynomial Chaos Framework, (first round of reviews done, **AIAA Journal of Guidance, Control, and Dynamics, IF:2.024**), 2019.

Peer Reviewed Journal Publications

1. R. Bhattacharya, Robust LQR Design for Systems with Probabilistic Uncertainty, **International Journal of Robust and Nonlinear Control, IF:3.856**, 2019.
2. 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, IF:1.406**, 2019.
3. N. Das, V. Deshpande, R. Bhattacharya, Optimal Transport Based Tracking of Space Objects using Range Data from a Single Ranging Station, **AIAA Journal of Guidance, Control, and Dynamics, IF:2.024**, 2019.
4. V. Tadiparthi, S. C. Hsu, R. Bhattacharya, Software for Tensegrity Dynamics, **The Journal of Open Source Software**, 2019.
5. K. Lee, R. Bhattacharya, Design of Resource-Optimal Switching for Resource-Constrained Dynamical Systems, **Journal of Control, Automation, and Systems, IF:2.173**, Vol 16, No 3, June 2018.
6. P. Dutta, A. Halder, R. Bhattacharya, Nonlinear Estimation with Perron-Frobenius Operator and Karhunen-Loeve Expansion, **IEEE Transactions on Aerospace and Electronic Systems, IF:1.394**, 2015.
7. K. Lee, R. Bhattacharya, Stability Analysis of Large-Scale Distributed Networked Control Systems with Random Communication Delays: A Switched System Approach, **System & Control Letters, IF:2.656**, 2015.
8. 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, IF:2.024**, 2015.
9. K. Lee, A. Halder, R. Bhattacharya, Performance and Robustness Analysis of Stochastic Jump Linear Systems Using Wasserstein Metric, **Automatica, IF: 6.126**, 2014.
10. A. Halder, R. Bhattacharya, Probabilistic Model Validation for Uncertain Nonlinear Systems. **Automatica, IF: 6.126**, 2014.
11. P. Dutta, R. Bhattacharya, Hypersonic State and Parameter Estimation Using Frobenius-Perron Operator, **AIAA Journal of Guidance, Control, and Dynamics, IF:2.024**, Vol 34, No. 2, 2011.
12. P. Dutta, R. Bhattacharya, Nonlinear Estimation of Hypersonic State Trajectories in Bayesian Framework with Polynomial Chaos, **AIAA Journal of Guidance, Control, and Dynamics, IF:2.024**, Vol 33, No. 6(1765-1778), 2011.

13. A. Halder, R. Bhattacharya, Dispersion Analysis in Hypersonic Flight During Planetary Entry Using Stochastic Liouville Equation, **AIAA Journal of Guidance, Control and Dynamics**, **IF:2.024**, Vol. 34, No. 2, pp. 459-474, 2011.
14. J. Fisher, R. Bhattacharya, Optimal Trajectory Generation with Probabilistic System Uncertainty Using Polynomial Chaos, **ASME Journal of Dynamic Systems, Measurement and Control**, **IF: 1.521**, Vol 133, Issue 1, Jan 2011.
15. A. Prabhakar, J. Fisher, R. Bhattacharya, Polynomial Chaos Based Analysis of Probabilistic Uncertainty in Hypersonic Flight Dynamics – **AIAA Journal of Guidance, Control, and Dynamics**, **IF:2.024**, Vol.33 No.1 (222-234), 2010.
16. P. Dutta, R. Bhattacharya, S. Chakravorty, Air-Traffic Control Using Ground-Delays and Rerouting of Flights – **AIAA Journal of Aerospace Computing, Information, and Communication**, **IF: 1.095**, Vol. 6, December 2009.
17. J. Fisher, R. Bhattacharya, Linear Quadratic Regulation of Systems with Stochastic Parameter Uncertainties – Volume 45, Issue 12, **Automatica**, **IF: 6.126**, 2009.
18. B. Singh, S. R. Vadali, R. Bhattacharya, Verification of Optimality and Costate Estimation Using Hilbert Space Projection – **AIAA Journal of Guidance, Control, and Dynamics**, **IF:2.024** Vol.32, No. 4, 2009.
19. S. H. Kim, R. Bhattacharya, Motion Planning in Obstacle Rich Environments – **AIAA Journal of Aerospace Computing, Information, and Communication**, **IF: 1.095** (1542-9423) vol.6 no.7, 2009.
20. J. Fisher, R. Bhattacharya, Analysis of Partial Stability Problems Using Sum of Squares Techniques – **Automatica**, **IF: 6.126** Volume 45, Issue 3, March 2009, Pages 724-730.
21. R. Bhattacharya, J. Fung, A. Tiwari, R. M. Murray, Cone Invariance and Rendezvous of Multiple Agents – **Journal of Aerospace Engineering**, **IF:0.454**, Sep 2009, Vol 223, No. G6.
22. R. Bhattacharya, G. J. Balas, Control in Computationally Constrained Environments – **IEEE Control Systems Technology**, **IF:4.883**, Volume 17, Issue 3, 2009.
23. R. Bhattacharya, G. J. Balas, Anytime Control Algorithm: Model Reduction Approach, **Journal of Guidance, Control, and Dynamics**, **IF:2.024**, Vol. 27, No.5, pp. 767-776, 2004.
24. R. Bhattacharya, G. J. Balas, Implementation of Online Control Customization within the Open Control Platform, *Software-Enabled Control: Information Technologies for Dynamical Systems*, A John Wiley/IEEE Press Publication, 2003.
25. 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**, **IF:2.024**, Vol. 25, No. 5, pp. 924-931, 2002.

Peer Reviewed Conference Publications

All conference papers are peer-reviewed based on 8 page paper submissions, and published as proceedings upon acceptance. IEEE American Control Conference and IEEE Conference on Decision and Control conferences have higher impact than some journals in the area of control, estimation and dynamics.

Submitted

1. N. Das, R. Bhattacharya, Optimal Sensor Precision for Ensemble and Unscented Kalman Filtering, IEEE CDC, Submitted, March 2019.

Published

1. K. Lee, R. Bhattacharya, On the Uniqueness of Stationary Solutions of an Asynchronous Parallel and Distributed Algorithm for Diffusion Equations, **IEEE CCWC**, 2019.

2. N. Das, R. Bhattacharya, Sparse Sensing Architecture for Kalman Filtering with Guaranteed Error Bound, **1st IAA Conference on Space Situational Awareness (ICSSA)**, 2017.
3. R. Saraf, R. Bhattacharya, R. Skelton, \mathcal{H}_2 Optimal Sensing Architecture, **IEEE American Control Conference** 2017.
4. S.C. Hsu, R. Bhattacharya, Design of Stochastic Collocation Based Linear Parameter Varying Quadratic Regulator, **IEEE American Control Conference** 2017.
5. K. Lee, R. Bhattacharya, On Relaxed Synchronization Strategy for Parallel Iterative Numerical Algorithms, **IEEE American Control Conference** 2016.
6. 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. **Acceptance rate < 30%**.
7. R. Bhattacharya, A Polynomial Chaos Framework for Designing Linear Parameter Varying Control Systems, **IEEE American Control Conference** 2015.
8. K. Lee, R. Bhattacharya, and V. Gupta, A Switched Dynamical System Framework for Analysis of Massively Parallel Asynchronous Numerical Algorithms, **IEEE American Control Conference** , 2015.
9. R. Bhattacharya, Robust State Feedback Control Design with Probabilistic System Parameters, **IEEE Conference on Decision and Control**, Los Angeles, 2014.
10. A. Halder, K. Lee, R. Bhattacharya, A Dynamical System Pair with Identical First Two Moments But Different Probability Densities, **IEEE Conference on Decision and Control**, Los Angeles, 2014.
11. K. Lee, R. Bhattacharya, Optimal Switching Synthesis for Jump Linear Systems with Gaussian Initial State Uncertainty, **ASME Dynamic Systems and Control Conference**, 2014.
12. A. Halder, R. Bhattacharya, Geodesic Density Tracking with Applications to Data Driven Modeling, **IEEE American Control Conference**, 2014.
13. K. Lee, A. Halder, R. Bhattacharya, Probabilistic Robustness Analysis of Stochastic Jump Linear Systems, **IEEE American Control Conference**, 2014.
14. A. Halder, R. Bhattacharya, Frequency Domain Model Validation in Wasserstein Metric, **IEEE American Control Conference** 2013
15. A. Halder, K. Lee, R. Bhattacharya, Probabilistic Robustness Analysis of F- 16 Controller Performance: An Optimal Transport Approach, **IEEE American Control Conference** 2013
16. P. Dutta, A. Halder and R. Bhattacharya, Nonlinear Filtering with Transfer Operator, **IEEE American Control Conference**, 2013.
17. R. Bhattacharya, J. Fisher, Linear Receding Horizon Control with Probabilistic System Parameters, **7th IFAC Symposium on Robust Control Design**, Aalborg, Denmark, June 2012.
18. A. Halder, R. Bhattacharya, Further Results on Probabilistic Model Validation in Wasserstein Metric. **IEEE Conference on Decision and Control**, Maui, 2012.
19. 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.
20. 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.
21. Zhenchun Xia, G.H.Huff, J.F.Chamberland, H.Pfister and R. Bhattacharya, **An Estimation Using Canonical and Crystallographic Volumetric Element Configurations**. EuCAP, Czech Republic, 2012.

22. A. Halder, R. Bhattacharya, Model Validation: A Probabilistic Formulation, **IEEE Conference on Decision and Control**, 2011.
23. P. Dutta, R. Bhattacharya, Nonlinear Estimation of Hypersonic Flight Using Polynomial Chaos, **AIAA GNC**, 2010.
24. A. Halder, R. Bhattacharya, Beyond Monte Carlo: A Computational Framework for Uncertainty Propagation in Planetary Entry, Descent and Landing, **AIAA GNC** 2010.
25. P. Dutta, R. Bhattacharya, Nonlinear Estimation with Polynomial Chaos and Higher Order Moment Updates, **IEEE American Control Conference** 2010.
26. B. Singh, R. Bhattacharya, Direct Optimal Control and Costate Estimation Using Least Square Method, **IEEE American Control Conference** 2010.
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