Chayan Bhawal

Personal Data

Place and Date of Birth:	Palasbari, Assam — 11th March 1986.
Address:	Room - 238, Control and Computing Lab, Department of Electrical Engineering, IIT Bombay.
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Education

2013 – 2019 Ph.D. in Electrical Engineering. (Defended on 5th March 2019)
Indian Institute of Technology Bombay, Mumbai.
Specialization – Control and Computing (CGPA – 9.25 out of 10).
Thesis title – Generalized Riccati theory: A Hamiltonian system approach.

2004 – 2008 Bachelor of Engineering.
Specialization – Electronics and Telecommunication.
Assam Engineering College, Jalukbari.
Grade – First class 2nd position with Honours (Percentage – 78.56%).

2002 – 2004 Higher Secondary Examination (10+2).
Cotton College, Guwahati, AHSEC (Percentage – 84.20%).

1990 – 2002 High School Leaving Certificate.
Arunodaya English Medium High School, Mirza, SEBA (Percentage – 83.17%).

Work Experience

Oct 2010 - June 2013 Assistant Professor, Electronics and Communication Engineering,
NETES Institute of Technology & Science Mirza (NITSM), Assam.

July 2008 - September 2010 Executive in Network Operations Department,
Vodafone Essar Spacetel Limited, Assam & NE circle.

Publications

Journal papers: published

1. Chayan Bhawal and Debasattam Pal, "Almost every single-input LQR optimal control problem admits a PD feedback solution", *IEEE Control Systems Letters*, vol. 3, no. 2, pages 452 - 457, 2019.

2. Chayan Bhawal, Imrul Qais, and Debasattam Pal, "Constrained generalized continuous algebraic Riccati equations (CGCAREs) are generically unsolvable", *IEEE Control Systems Letters*, vol. 3, no. 1, pages 192–197, 2019.

3. Chayan Bhawal, Debasattam Pal, and Madhu N Belur, "Closed form solutions of a singular case of KYP lemma: strongly passive systems, and fast lossless trajectories", Early access, Digital Object Identifier: 10.1080/00207179.2018.1500039, *International Journal of Control*, 2018.

4. Chayan Bhawal, Debasattam Pal, Sandeep Kumar, and Madhu N Belur, "New results and techniques for computation of stored energy in lossless/all-pass systems", *IEEE Transactions on Circuits and Systems I: Regular Papers*, vol. 64, no. 1, pages 72–85, 2017.

Contributed book chapter

5. Chayan Bhawal, Sandeep Kumar, Debasattam Pal, and Madhu N Belur, " New properties of ARE solutions for strictly dissipative and lossless systems", *Mathematical Control Theory II: Behavioral Systems and Robust Control*, pages 81-99, Springer International Publishing, Cham, 2015.

Conference papers: peer-reviewed

6. Ashish Kothyari, Chayan Bhawal, Madhu N Belur, and Debasattam Pal, "Defective Hamiltonian matrix imaginary eigenvalues and losslessness", *In Proceedings of Indian Control Conference (ICC)*, Delhi, India, January 9 - January 11, 2019.

7. Chayan Bhawal, Debasattam Pal, and Madhu N Belur, "On solutions of bounded-real LMI for singularly bounded-real systems", *In Proceedings of European Control Conference (ECC)*, Limassol, Cyprus, June 12 - June 15, 2018.

8. Chayan Bhawal, Debasattam Pal, and Madhu N Belur, "On the link between storage functions of allpass systems and Gramians", *In Proceedings of* 56^{th} *IEEE Conference on Decision and Control (CDC)*, Melbourne, Australia, December 12 - December 15, 2017.

9. Chayan Bhawal, Debasattam Pal, and Madhu N Belur, "A 2D-DFT based method to compute the Bezoutian and a link to Lyapunov equations", *In Proceedings of Indian Control Conference (ICC)*, Guwahati, India, January 4 - January 6, 2017.

10. Sandeep Kumar, Chayan Bhawal, Debasattam Pal, and Madhu N Belur, "New results and algorithms for computing storage functions: The lossless/allpass cases", *In Proceedings of European Control Conference (ECC)*, Aalborg, Denmark, June 29 - July 1, 2016.

Preprint: under-review/to be submitted

11. Chayan Bhawal, Imrul Qais, and Debasattam Pal, The optimal cost of the singular LQR problem, and fast/slow subspaces of the Hamiltonian system.

12. Chayan Bhawal and Debasattam Pal, On constructive solutions of the KYP lemma for singularly passive systems: smooth lossless trajectories and extremal solutions.

13. Ashish Kothyari, Chayan Bhawal, Madhu N. Belur, and Debasattam Pal, Imaginary eigenvalues of Hamiltonian matrix: controllability, defectiveness and ε-characteristics.

Talks presented

- Oral paper presentations of accepted conference papers in European Control Conference (2016, 2018), IEEE Conference on Decision and Control (2017), and Indian Control Conference (2017).
- Generalized eigenvalue problem, Invited speaker at the Students' Reading Group, Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India, 2017.

Workshops/Sessions conducted

- Basics of Scilab, Dr. Ambedkar Institute of Technology, Bangalore under TEQIP, 2018.
- Robotics using AVR and PIC Microcontrollers, NITSM Labs, Guwahati and Bangalore, 2011.

Other Activities

- Reviewer for IEEE Transactions of Circuits and Systems-I: Regular Papers and Indian Control Conference.
- Student co-ordinator of Electrical Engineering Students' Reading Group (SRG), IIT Bombay, 2015-2016.
- Co-ordinator for conducting examination of 4 year BE course of Gauhati University at NITSM, 2011-2013.
- Faculty co-ordinator of Sastricas'11, the first annual technical festival of NITSM, 2011.

Language Proficiency

	Programming	Version Control	Typesetting
Intermediate	Scilab, Matlab		LaTeX
Basic	C, Python, Bash, Sage, Mathematica	Git	

Referees

Referee	**Email-ID**	**Association**	**Affiliation**
Prof. Debasattam Pal	debasattam@ee.iitb.ac.in	Supervisor	Department of Electrical Engineering, IIT Bombay
Prof. Madhu N. Belur	belur@ee.iitb.ac.in	Co-supervisor	
Prof. Debraj Chakraborty	dc@ee.iitb.ac.in	Research progress committee member	
Prof. Harish K. Pillai	hp@ee.iitb.ac.in		