

# Md Sumon Hossain

 Google scholar

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## Personal Information

Date of birth: 01 July 1984  
Place of birth: Ishwardi, Pabna  
Nationality: Bangladeshi  
Marital status: Married

## Education

Ph. D. in Mathematics Groningen, The Netherlands  
University of Groningen 2018 - 2022

- Area of Study: Realization Theory and Model Reduction.
- Thesis title: Reduced realizations and model reduction for switched linear systems.
- Supervisors: Prof. Stephan Trenn, Prof. M. Kanat Camlibel.
- Grade: Average marks above 80%.

M. Phil. in Mathematics Dhaka, Bangladesh  
BUET 2014 - 2017

- Area of Study: Mathematics.
- Thesis title: Efficient solution of Lyapunov equation for descriptor system and application to model order reduction.
- Supervisors: Prof. M. Forhad Uddin, Prof. M. Monir Uddin.
- Results: **3.54, 1st merit position.**

Masters in Mathematics Rajshahi, Bangladesh  
University of Rajshahi 2008 - 2009

- Area of Study: Mathematics.
- Results: **First class, 4th merit position.**

Bachelor in Mathematics Rajshahi, Bangladesh  
University of Rajshahi 2003 - 2007

- Results: **First class, 4th merit position.**

## Research Interests

- System and Control Theory
- Model Reduction
- Numerical Linear Algebra
- Machine learning

## Professional Experience

Teaching Assistant Groningen, The Netherlands  
Department of Mathematics Jul 2018 - Jul 2022  
University of Groningen

- Collaborated with teachers to determine appropriate actions and conducted research.
- Led seminars, workshops, tutorials to support students' understanding of course material.
- Supervised, assessed student performance and provided constructive feedback.

Lecturer Munshiganj, Bangladesh  
Department of Mathematics Mar 2014 - Jun 2018  
Hamdard University Bangladesh

- Taught undergraduate courses in Mathematics, developed and delivered lectures, facilitated and provided academic advising and guidance to students. Participate in professional development activities and stay up to date with current advancements in the field.

Lecturer Dhaka, Bangladesh  
Department of Natural Science May 2010 - Feb 2014  
World University Bangladesh

- Conducted and prepared courses, graded assignments, and provided feedback to students.

## List of Publications

### Journal Articles

1. **Md Sumon Hossain** and Stephan Trenn. Midpoint based balanced truncation for switched linear systems with known switching signal. *IEEE Transactions on Automatic Control*, vol. 69, no. 1, 2023.
2. **Md Sumon Hossain** and Stephan Trenn. Reduced realization for switched linear systems with known mode sequence. *Automatica*, vol. 154, no. 111065, 1-9, 2023.
3. **Md Sumon Hossain** and M. Monir Uddin. Iterative methods for solving large sparse Lyapunov equations and application to model reduction of index-1 differential-algebraic-equations. *Numerical Algebra, Control and Optimization*, 9(2): 173-186, 2019.
4. Manik Mondal, M. Forhad Uddin and **Md Sumon Hossain**. Estimation of inventory for deteriorating items with non-linear demand considering discount and without discount policy. *Journal of Naval Architecture and Marine Engineering*, 13(2): 151-164, 2016.

## Conference Papers

1. **Md Sumon Hossain** and Stephan Trenn. A weak Kalman decomposition approach for reduced realizations of switched linear systems. IFAC-PapersOnLine, 55(20): 157-162, 2022.
2. **Md Sumon Hossain** and Stephan Trenn. Minimal realization for linear switched systems with a single switch. European Control Conference (ECC), 1168-1173, 2021.
3. **Md Sumon Hossain** and Stephan Trenn. Minimality of linear switched systems with known switching signal. Applied Mathematics and Mechanics, pamm.202100067, 2021.
4. **Md Sumon Hossain** and Stephan Trenn. A time-varying Gramian based model reduction approach for Linear Switched Systems. IFAC-PapersOnLine, 53(2): 5629-5634, 2020.
5. **Md Sumon Hossain**, M. Forhad Uddin and Manik Mondal. The Effects of Coordination Mechanism on Vendor Buyer System of a Supply Chain. 10th International Conference on Marine Technology (MARTEC), 194, 529-536, 2017.
6. M. Monir Uddin, **Md Sumon Hossain**, M. Forhad Uddin. Rational Krylov Subspace Method (RKSM) for solving the lyapunov equations of index-1 descriptor systems and application to balancing based model reduction. 9th International Conference on Electrical and Computer Engineering (ICECE), 451-454, 2016.

## Extended Abstracts, Posters & Source codes

- **Md Sumon Hossain**, Sutrisno Sutrisno and Stephan Trenn. A time-varying approach for model reduction of singular linear switched systems in discrete time. 25th International Symposium on Mathematical Theory of Networks and Systems (MTNS), 12-16 September, Bayreuth, Germany, 2022.
- **Md Sumon Hossain** and Stephan Trenn. Model reduction of switched systems in time-varying approach. 39th Benelux Meeting on Systems and Control, Elspeet, The Netherlands, 10 - 12 March, 2020.
- **Md Sumon Hossain** and Stephan Trenn. A piecewise time varying approach for model reduction of switched linear system. 38th Benelux Meeting on Systems and Control, Lommel, Belgium, 19 - 21 March, 2019.
- **Md Sumon Hossain** and M. Monir Uddin. Balancing Based Model Reduction for Descriptor Systems using Rational Krylov Subspace Method. Model order reduction summer school, Hamburg University, 24-28 Sep, Germany, 2018.
- **Md Sumon Hossain** and Stephan Trenn. rrSLS - Reduced realization for switched linear systems. Zenodo, 2022.
- **Md Sumon Hossain** and Stephan Trenn. btSLS - Balanced truncation for switched linear systems, Zenodo, 2022.

## International Conference and Seminar talks

- A weak Kalman decomposition approach for reduced realizations of switched linear systems, 10th Vienna International Conference on Mathematical Modelling (MATHMOD), Vienna, Austria, 27–29 July, 2022.
- Minimal realization for linear switched systems with a single switch. 2021 European Control Conference (ECC), Delft, Netherlands, 29 June - 02 July, 2021.
- Minimality of linear switched systems with known switching signal. 91st GAMM Annual Meeting of the International Association of Applied Mathematics and Mechanics, Kassel, Germany, 15-19 March, 2021.
- A time-varying Gramian based model reduction approach for Linear Switched Systems, 21st IFAC World Congress, Berlin, Germany, 11–17 July, 2020.

- A piecewise time varying approach for model reduction of switched linear system. 38th Benelux Meeting on Systems and Control, Lommel, Belgium, 19 - 21 March, 2019.
- 9th Workshop on Differential-Algebraic Equations (DESCRIPTOR 2019), Paderborn, Germany, 17 - 20 March, 2019.
- Rational Krylov Subspace Method (RKSM) for solving the Lyapunov equations of index-1 descriptor systems and application to balancing based model reduction, 9th International Conference on Electrical and Computer Engineering (ICECE), BUET, Bangladesh, 20-22 Dec. 2016.

## Honors and Awards

- PhD Scholarship in University of Groningen, Netherlands (2018-2022).
- Gold medal award, AFMR Foundation, for excellence in Mathematics and highest score in M.Phil. BUET, 2017.
- Best paper and presentation award, international conference, ICECE, BUET, 2016.

## References

- Prof. Mohammed Forhad Uddin  
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- Prof. Stephan Trenn  
University of Groningen  
Groningen, The Netherlands  
Email: s.trenn@rug.nl.
- Prof. M. Kanat Camlibel  
University of Groningen  
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