

Curriculum Vitae

Mohammad-Sahadet Hossain

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Personal Information

Date of Birth	December 7, 1978
Place of Birth	Munshigonj, Bangladesh
Marital Status	Married
Nationality	Bangladeshi

Academic Record

- June 2006 - Present PhD candidate in Mathematics, at Chemnitz University of Technology, Chemnitz, Germany. Supervisor: Prof. Dr. Peter Benner. Research topic "**Model reduction of linear time-varying descriptor systems and control**". (possible date for completeness: Summer term 2010).
- Apr 2005 - Apr 2006 One year ¹**International Master** study at Chemnitz University of Technology, Germany. (Major: Optimal control theory, Numerical differential equation, Graph theory, Computer tomography, Mathematical analysis).

¹ Visited some essential lectures and gave talks in seminars as a demand for starting PhD on selected topics.

- 2000 – 2001 **M.S** in Applied Mathematics, from Dhaka University, (exam held 2002-03) Bangladesh, with placement - 1st Class 3rd position.
- 1996 – 2000 **Honors**, in Mathematics, from Dhaka University, (exam held 2002-03) Bangladesh, with placement - 1st Class 4th position. (Minor: Computer science, Physics, Statistics).
- 1993 -1995 **Higher Secondary** (H.S.C, in Science group) from Notre Dame College, Dhaka, Bangladesh, with 1st Class * Mark.
- 1983 -1993 **Secondary School** (S.S.C) from Abdullapur High School, Tongibari, Munshigonj, Bangladesh, with 1st Class * Mark.

Honors and Scholarships awarded

- DFG (German Research Foundation) scholarship of the Free State Saxony, Germany. Duration: August 2009 - Devember 2010.
- Young Research assistantship from "**DAAD**" (4 months in a year) in 2007 and 2008, Germany.
- Dhaka University Merit Scholarship - 2005 (based on M.S result)
- Dhaka University Merit Scholarship - 2003 (based on B.Sc result)
- Dhaka Board Scholarship - 1995 (based on H.S.C result)
- Dhaka Board Scholarship - 1993 (based on S.S.C result)
- Junior and Primary School Scholarship – 1991 and 1988

Professional Experience

- Dec. 2008 – July 2009 "**Research associate**" in my working group "Mathematics in Industry and Technics" at TU Chemnitz (Chemnitz University of Technology, Germany).

- July 2008 - Nov. 2008 **"Scientific assistant"** at TU- Berlin (Technical University of Berlin), Germany in the research group "Numerical Analysis"
- Oct. 2006 – June 2008 **"Research associate"** in my working group "Mathematics in Industry and Technics" at TU Chemnitz (Chemnitz University of Technology, Germany).
- 2002 –2003 **"Teacher"** at Positron University Admission Aid, Dhaka, Bangladesh

Research Project

- Dec. 2008 – Present I worked as **"Research assistant"** in the DFG (German Research Foundation) funded project "Development and Implementation of Numerical Algorithms for Model Reduction of Periodic Descriptor Systems".
- July 2008 - Nov. 2008 I worked as a **"Research assistant"** in the BMBF (Federal Ministry of Education and Research, Germany) funded project "System Reduction for Nanoscale IC Design (SyreNe)".
- Oct. 2006 – Jul. 2008 I worked as **"Graduate research assistant"** in the DFG (German Research Foundation) funded project "Automatic, Parameter-Preserving Model Reduction for Applications in Microsystems Technology.

Research Interests

My research interest lies mostly in model order reduction of large scale linear time-varying descriptor systems arising in micro-electronics and circuit simulations, periodic-time varying filters and networks, multirate-data systems, aerospace realm, control of industrial processes and communication systems. I've been studying the descriptor cases where the system matrices are time-varying and they can be singular at any sampling time points. Therefore, the usual model order reduction techniques can not be used directly to find a reduce order model. My interest lies on finding the reduced model using projection based methods where the solution space is approximated using special projection technique depending on the system structures. For large scale sparse systems, I have also studied the iterative techniques to find the low-rank solutions of the projected periodic matrix equations (Lyapunov equations) and apply them to find reduced order model. My future work focuses on exploiting the specific structures (block structures) of the systems matrices and get benefits in the whole process of finding the reduced order model.

Publications

1. P. Benner, M. -S. Hossain and T. Stykel; *Model Reduction of Periodic Descriptor Systems Using Balanced Truncation*; to appear in Lecture Notes in Electrical Engineering; Springer-Verlag; Berlin/Heidelberg, 2009.
2. M. -S. Hossain, M. M. Rahman; *A Study of Linear Differential Algebraic Equations With Constant Coefficients*; Journal of science and technology, Volume 4, Issue 2, July 2009, Daffodil international University, Bangladesh.
3. M. -S. Hossain and P. Benner; *Projection-Based Model Reduction for LTV Descriptor Systems Using Multipoint Krylov Subspace Projectors*; Proceedings in Applied Mathematics and Mechanics; Vol. 8, No. 1, pp. 10081-10084, 2008.

Technical reports

1. M. -S. Hossain, P. Benner; *Model Reduction for Time-Varying Descriptor Systems Using Krylov-Subspaces Projection Techniques* ; Preprint, Chemnitz University of Technology ; 2007.

Talks in Conferences and Workshops

1. On Model Reduction for Periodic Descriptor Systems Using Balanced Truncation ; Workshop On Model Reduction for Circuit Simulation, 30. and 31. October 2008 in Hamburg, Germany
2. Projection-Based Model Reduction for LTV Descriptor Systems Using Multipoint Krylov-Subspace Projectors ; GAMM Annual Meeting 2008, Bremen, Germany.
3. Model Reduction of Linear Time-Varying Systems Using Multipoint Krylov-Subspace Projections ; Berlin-Braunschweig-Chemnitz Workshop On Recent Advance in Model Reduction, Nov. 27, 2006; Chemnitz, Germany

Research Visits to Other Conferences and Workshops:

1. "Model Reduction of Parametrized Systems (MoRePaS)", University of Münster, September 16-18, 2009; Münster, Germany.
2. "Southeast- German (Südostdeutsches) Colloquium for Numerical Mathematics, May 8, 2009; TU Chemnitz, Chemnitz, Germany.
3. "Symposium on Recent Advances in Model Order Reduction", TU Eindhoven, Nov. 2007; The Netherlands.

Seminar Talks

1. "Low-Rank Iterative Solution for Projected Lifted Periodic Lyapunov Equations"; Research Seminar Numerics, January 12, 2010; TU-Chemnitz, Germany
2. "On Model Order Reduction for Periodic Descriptor Systems Using Balance Truncation"; Research Seminar Numerics, Oct. 21, 2008; TU-Chemnitz, Germany.
3. "An Approach to Balance Truncation Model Reduction for Periodic Descriptor Systems"; Research Seminar Numerics, June 24, 2008; TU-Chemnitz, Germany.
4. "Dimension Reduction of Fast-Slow Components of ODE Systems"; Research Seminar Numerics; Dec. 12, 2006; TU- Chemnitz, Germany.
5. "Numerical Methods for DAEs: One-Step Methods"; Master Course Seminar, June 27, 2006; TU- Chemnitz, Germany.
6. " Linear DAEs with Constant Coefficients: Canonical Forms"; Master Course Seminar, April 18, 2006; TU- Chemnitz, Germany.

Professional Membership

- *SIAM*: Society of Industrial and Applied Mathematics, student member
- Bangladesh Mathematical Society (life-time member)

Computer Skills

Programming Language: Matlab (all updated versions), FORTRAN, C++.
Software Packages: Mathematica, Derive, Smart Draw.
Professional Software: LaTeX, MS Office Suit, Adobe Photoshop.
Operating System: Linux, Windows.

Language Skills

- Bangla (native).
- English (language of study and instructions (Bachelor, Master, and PhD)).
- German (from TU Chemnitz, Germany, and Goethe Institute, Dhaka, Bangladesh).

Hobbies

Music
Photography

References

Available upon request

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