MOHAMMAD MONIR UDDIN

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Personal data

Date of birth	November 30, 1978
Place of birth	Sandwip, Chittagong, Bangladesh
Nationality	Bangladesh
Marital Status	Married

Current status

- **Assistant Professor in Mathematics** (North South University), Dhaka, Bangladesh.

Education

PhD in Mathematics	Magdeburg, Germany
Max Planck Institute for Dynamics of Complex Technical Systems	*2011 - 2014*

Master of Science in Applied Mathematics	Stockholm, Sweden
Stockholm University	*2008 - 2010*
Results: Average marks above 80%	

Master of Scinece in Pure Mathematics	Chittagong, Bangladesh
Chittagong University	*2003 - 2005*
Results: First Class (2nd position in the department)	

Bachelor of Scinece in Mathematics	Chittagong, Bangladesh
Subsidiary: Physics, Statistics and Economics	*1998 - 2003*
Chittagong University	
Results: First Class (6th position in the department)	

Thesis

PhD thesis

Title: "Computational Methods for Model Reduction of Large-Scale Sparse Descriptor Systems".

Status: Thesis submitted.
Advisors:

- Prof. Dr. Peter Benner
  Director
  MPI Magdeburg, Magdeburg, Germany.

- Prof. Matthias Heinkenschloss
  Chairman
  Dep. of Computational and Applied Mathematics
  Rice University, USA.

- Dr. Jens Saak,
  Team leader in the Dep. of CSC
  MPI Magdeburg, Magdeburg, Germany.

Note: In this thesis we study some prominent model reduction methods namely, balanced truncation and iterative rational Krylov subspace algorithm (IRKA). We develop algorithms for model reduction of the structured descriptor systems and apply them to several real world problems which appear from different brunches of Science and Engineering. This research work was performed at the Dep. of CSC, MPI Magdeburg and supported by the IMPRS ProEng.
Available: `http://pubman.mpdl.mpg.de/pubman/faces/viewItemOverviewPage.jsp?itemId=escidoc:2164133`

Master thesis

Title: "Model Reduction of Piezo Mechanical Systems Using Balanced Truncation"
Advisors:

- Prof. Dr. Peter Benner
  Director
  MPI Magdeburg, Magdeburg, Germany.
- Prof. Boris Shapiro
  Professor Dep. of Mathematics, Stockholm University, Sweden.
- Dr. Jens Saak,
  Team leader in the Dep. of CSC
  MPI Magdeburg, Magdeburg, Germany.

Note: In this thesis we develop an balancing based algorithm for model reduction of high dimensional second order descriptor systems. The algorithm is then applied to Piezo actuators based adaptive spindle support model. This work is performed in the Group Mathematics for Industry and Technology headed by Prof. Peter Benner, TU Chemintz.
Available: `http://monarch.qucosa.de/fileadmin/data/qucosa/documents/7822/Master_Thesis_Uddin.pdf`

Research interests

- Model Order Reduction.
- Systems and Control Theory.
- Iterative Methods for Large Sparse Matrix Equations (Silvester, Lyapunov, Riccati etc.).
- Numerical Linear Algebra.
- Optimization.
- Scientific Computing.

Teaching experience

Assistant Prof. in Mathematics,   Dhaka, Bangladesh
Dept. of Mathematics & Physics   *Sep 2015- Present*
North South University

Assistant Prof. in Mathematics,   Dhaka, Bangladesh
Department of Mathematics   *May 2015- Aug 2015*
American International University-Bangladesh

Lecturer in Mathematics,   Dhaka, Bangladesh
Department of Natural Science   *Mar 2006- Oct 2008*
Stamford University Bangladesh

Lecturer in Mathematics (Part-time)   Dhaka, Bangladesh
International Islamic University Chittagong, Dhaka Campus   *Aug 2007- Apr 2008*

Research experience

Research fellow	Magdeburg, Germany
Dep. of Computational Methods in Systems and Control Theory, MPI Magdeburg	*Apr 2012- Apr 2015*
Research Student	Stockholm, Sweden
Department of Mathematics, Stockholm University	*Mar 2011 - Aug 2011*
Research Assistant	Chemnitz, Germany
Department of Mathematics, TU Chemnitz	*June 2011*

List of Publications

Journal papers

[1] M. M. Uddin, J. Saak, B. Kranz, and P. Benner, *Computation of a compact state space model for an adaptive spindle head configuration with piezo actuators using balanced truncation*, Production Engineering (Spinger), 6 (2012), pp. 577–586.

[2] P. Benner, J. Saak, and M. M. Uddin, *Balancing based model reduction for structured index 2 unstable descriptor systems with application to flow control*, Numerical Algebra, Control and Optimization (AIMS) 6 (1), 2016 Available from http://www.mpi-magdeburg.mpg.de/preprints/.

[3] M-S Hossain, and M. M. Uddin, *Reduce Order Modelling of Power System Models Using Interpolatory Projections Technique*, International Journal of Modeling and Optimization, 5 (2015), pp. 228–233.

[4] P. Benner, J. Saak, and M. M. Uddin, *Structure preserving mor for large sparse second order index 1 systems and application to a mechatronic model*, Preprint MPIMD/14-23, Max Planck Institute Magdeburg, Dec. 2014. Available from http://www.mpi-magdeburg.mpg.de/preprints/. To be submitted to Production Engineering.

[5] M. M. Uddin, J. Saak, B. Kranz, and P. Benner, *Efficient reduced order state space model computation for a class of second order index one systems*, PAMM, 12 (2012), pp. 699–700.

[6] J. Saak, M. M. Uddin and M. voigt, *Balancing based model order reduction for differential-algebraic equations in mechanical applications*, In preparation.

Conference papers

[1] P. Benner, J. Saak, and M. M. Uddin, *Second order to second order balancing for index-1 vibrational systems*, in 2012 7th International Conference on Electrical & Computer Engineering (ICECE), IEEE, 2012, pp. 933–936.

[2] J. Saak, M. M. Uddin, and M. Voigt, *Modellreduktion fr strukturierte Index-3-Systeme*, in Tagungsband des GMA-Fachausschusses 1.30, Modellbildung, Identifikation und Simulation in der Automatisierungstechnik, O. Sawodny and J. Adamy, eds., Technische Universität Darmstadt, Institut für Automatisierungstechnik und Mechatronik, 2013, pp. 180–190.

[3] M. M. Uddin, and M-S Hossain, *Reduce Order Modelling of Power System Models Using Interpolatory Projections Technique*, Submitted to 2nd International Conference on Electrical Engineering and Information & Communication Technology (ICEEICT), 2015.

Others

[1] M. M. Uddin, *Model Reduction for Piezo-Mechanical Systems Using Balanced Truncation*, QUCOSA, Germany, 2011. Available from http://www2.mpi-magdeburg.mpg.de/mpcsc/events/ModRed/2013/

[2] M. N. Uddin, M. M. Uddin and N. K. Mitra *Solution of Ordinary Differential Equations by Runge-Kutta Methods*, ASA University Review, 3 (2009), pp. 699–700.

Posters

[1] M. I. AHMAD, J. SAAK, M. M. UDDIN, AND M. VOIGT, *Model Order Reduction for Structured Second Order DAE System*, Workshop on Non-linear Model Order Reduction 2014, Schloss Ringberg Tegernsee, Germany, June 2014.

[2] J. SAAK, AND M. M. UDDIN, *Balanced Truncation for unstable linearized Navier-Stokes Systems*, Workshop on Non-linear Model Order Reduction 2014, Schloss Ringberg Tegernsee, Germany, June 2014.

Conferences and workshops and summer schools

Talks

1. "Two Competitive techniques for Reduced State Space Modeling of Time-Invariant Large-Scale Continuous-Time stems",*19th International Math Conference 2015*, BRAC University, Dhaka, Bangladesh. 18-20 December 2015.

2. "Balancing Based Model Reduction of Unstable Descriptor Systems", *7th IMPRS Workshop 2014*, Wernigerode, Germany; 23-25 April, 2014.

3. "Dimension Reduction of Large-Sparse Second Order Descriptor Systems", *6th IMPRS Workshop 2013*, Wittenberg, Germany; 8-9 April, 2013.

4. "Second Order to Second Order Balancing for Index-1 Vibrational Systems", *7th International Conference on Electrical & Computer Engineering (ICECE)*, Dhaka, Bangladesh; 20-22 December, 2012.

5. "Second Order to Second Order Balancing for Index-1 Vibrational Systems", *7th International Conference on Electrical & Computer Engineering (ICECE)*, Dhaka, Bangladesh; 20-22 December, 2012.

6. "Efficient Methods for Reduced Order State Space Modeling of Piezo-Mechanical Systems", *GAMM Workshops 2012: Dynamics and Control*, Anif/Salzburg, Austria, 18-21 September, 2012.

7. "Model Reduction of Mechanical Systems with Piezo Actuators Using Balanced Truncation", *CSC seminar, MPI Magdeburg*, Magdeburg, Germany, 07 February, 2012 .

8. "Model Reduction for Piezo-mechanical Systems Using Balanced Truncation", *Stockholm University*, Stockholm, Sweden, 29 April, 2011.

Participation

9. *"3rd Symposium of the German SIAM Student Chapters"*, MPI Magdeburg, Germany, 18-19 August 2014.

10. *"Model Reduction of Complex Dynamical Systems 2013"*, MPI-Magdeburg, Germany, 11-13 December 2013.
Details:`http://www2.mpi-magdeburg.mpg.de/mpcsc/events/ModRed/2013/`

11. *"3rd Summer School of the IMPRS Magdeburg for Analysis, Design, and Optimization in Chemical and Biochemical Process Engineering on MULTISCALE MODELING AND SIMULATION"*, Magdeburg, Germany, 02-06 September 2011.
`http://www.pe-imprs.mpg.de/summerschool2013`

12. *"Workshop on Non-linear Model Order Reduction 2012"*, Schloss Ringberg Tegernsee, Germany, 6-9 May 2012.

13. *"4th Elgersburg School 2012 on systems and control theory and its applications"*, Elgersburg , Germany, 11-17 March 2012.
`http://www.tu-ilmenau.de/math/forschung/tagungen/elgersburg-schools/elgersburgschool2012/`

14. *"2nd summer school of the IMPRS ProEng on large scale networks and Engineering and life science"*, Magdeburg, Germany, 26-30 September 2011.
`http://www.pe-imprs.mpg.de/summerschool2011`

University visit

Dep. of Electrical Engineering and Computer Science,	Dhaka, Bangladesh
North South University (NSU)	Dec 13-24, 2012
Dep. of Electrical Engineering and Computer Science,	Dhaka, Bangladesh
North South University (NSU)	May 24-30, 2014

Note: I am collaborating with Dr. Mohammad Sahadet Hossain, Assistant Professor, Dep. of Mathematics and Physics, NSU. In this research collaboration we mainly focus on model reduction of circuit simulation.

Languages

Proficient in English, Bangla (native), Basic knowledge of German, Swedish.

Computer skills

- Programming Language: MATLAB, Python, FORTRAN, C++
- Professional Software: LaTex, Latex beamer
- Operating system: Linux, Windows

Membership

IMPRS ProEng	Magdeburg, Germany since April 2012
Society of Industrial and Applied Mathematics (SIAM) Student Chapter	Magdeburg, Germany since 2012
SIAM academic member,	Philadelphia USA since 2012
Magdeburg International PhD Students	Magdeburg, Germany since 2012
Matrix Equations Team at MPI Magdeburg	Magdeburg, Germany since 2013

References

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