

CURRICULUM VITAE - SERKAN GUGERCIN

Virginia Tech
Department of Mathematics
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EDUCATION

Rice University, Houston, Texas

Ph.D. in Electrical Engineering, May 2003

Thesis: *Projection Methods for Model Reduction of Large Scale Dynamical Systems*

Advisor: A.C. Antoulas

M.S. in Electrical Engineering, December 1999

Thesis: *Model Validation and Consistency*

Advisor: A.C. Antoulas

Middle East Technical University, Ankara, Turkey

B.S. in Electrical and Electronics Engineering, June 1997

EMPLOYMENT

Professor –	Department of Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, August 2013 – present.
Associate Professor –	Department of Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, June 2008 – August 2013.
Research Scientist –	Institut für Mathematik, Technical University, Berlin, October 2009 – May 2010.
Assistant Professor –	Department of Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, August 2003 – June 2008.
Research Instructor –	Department of Electrical Engineering and Computer Science, Jacobs University of Bremen, Bremen, Germany, February 2003-July 2003.

RESEARCH INTERESTS

- Dynamical systems, numerical analysis and scientific computing
- Projection methods for approximation of large-scale dynamical systems
- Computation and analysis of reduced-order models for distributed parameter systems
- Model reduction of parameterized dynamical systems
- Inverse problems and parameter estimation with applications in diffuse optical tomography
- Model reduction and control for energy-efficient buildings
- Reduced order controller design for large-scale systems
- Model reduction of structured dynamical systems

HONORS

- Ralph Budd Award for Research in Engineering, Rice University, School of Engineering, May 2003. Given annually to the person judged to have written the best doctoral thesis in the School of Engineering.
 - Jacobs University Bremen 2003 Teaching Award, May 2003.
 - National Science Foundation Early CAREER Award in Computational and Applied Mathematics, 2007.
 - Virginia Tech. Scholar of The Week for the weeks of May 18 and 25, 2009.
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SPONSORED RESEARCH

- National Science Foundation Grant DMS-0505971, *Model Reduction with Rational Krylov Methods*, Co-PIs: C. Beattie and S. Gugercin, June 1, 2005 – May 31, 2008, \$210,766
 - National Science Foundation Grant DMS-0513542, *Computation and Analysis of Reduced-Order Models for Distributed Parameter Systems*, Co-PIs: J. Borggaard, C. Beattie, S. Gugercin, and T. Iliescu, June 15, 2005 - June 14, 2008, \$431,342
 - Air Force Office of Scientific Research Grant FA9550-05-1-0449, *High Performance Parallel Algorithms for Improved Reduced-Order Modeling*, Co-PIs: J. Borggaard, C. Beattie, S. Gugercin, and T. Iliescu, August 15, 2005 – November 30, 2007, \$502,245
 - National Science Foundation Grant DMS- 0645347, CAREER: *Reduced-order Modeling and Controller Design for Large-scale Dynamical Systems via Rational Krylov Methods*, May 1, 2007 - April 30, 2013, \$400,000.
 - Department of Energy, *Advanced Computer Design Tools for Modeling, Design, Control, Optimization and Sensitivity Analysis of Integrated Whole Building Systems* (VT ICAM component of the Greater Philadelphia Innovation Cluster, DOE HUB). Co-PIs: J. Burns, E. Cliff, S. Gugercin, T. Herdman, T. Iliescu, M. Marathe and L. Zietsman, 2010-2015, \$5,000,000.
 - National Science Foundation Grant DMS- 1217156, *Collaborative Research: Innovative Integrative Strategies for Nonlinear Parametric Inversion*. Co-PIs: C. Beattie, E. de Sturler, S. Gugercin, and M. Kilmer. September 2012- August 2015, \$359,942 (Virginia Tech component), \$190,00 (Tufts component).
 - National Institute for Occupational Safety and Health, *Investigation of Reduced Order Fire Modeling for Improved Safety and Response in Underground Coal Mines*. Co-PIs: J. Borggaard, S. Gugercin, B. Lattimer, K. Luxbacher, S. Schafrik. September 2014- August 2019, \$1,247,839.
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PROFESSIONAL SERVICE:

Editorial Positions

- Associate Editor for Systems and Control Letters (2010-Present)
- Associate Editor for IEEE Control Systems Society Conference Editorial Board (2009-Present)
- Associate Editor for the 21st International Symposium on Mathematical Theory of Networks and Systems, 2014

Conferences Organized

- International Symposium on Mathematical Theory of Networks and Systems (MTNS 2008) in Blacksburg, VA, July 2008 (with A.C. Antoulas, J. Ball, C.A. Beattie, and T. Georgiou).
- Local Organizing Committee Member for Householder Symposium XX, June 2017.

Minisymposia Organized

- *Model Reduction of Dynamical Systems*, SIAM Annual Meeting, July 2006, Boston, MA (with K. Willcox). 2 sessions, 8 Talks.
 - *Model Reduction*, 2009 SIAM Conference on Computational Science and Engineering, March 2009, Miami, FL (with C.A. Beattie). 5 sessions, 20 Talks.
 - *Recent Advances in Model Reduction*, 2012 SIAM Conference on Applied Linear Algebra, June 2012, Valencia, Spain (with A.C. Antoulas). 2 Sessions, 8 Talks.
 - *Data-Driven and Nonlinear Model Reduction*, 2013 SIAM Conference on Computational Science and Engineering, February-March 2013, Boston, MA (with B. Haasdonk). 3 sessions, 12 Talks.
 - *Parametric Model Reduction and Inverse Problems*, 2015 SIAM Conference on Computational Science and Engineering, March 2015, Salt Lake City, UT (with C.A. Beattie, E. de Sturler, E. Haber, M. Kilmer, L. Ruthotto). 4 sessions, 16 Talks.
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REFEREED PUBLICATIONS

Book Chapters

- A.1 J.T. Borggaard and S. Gugercin. [Model Reduction for DAEs with an Application to Flow Control](#). Active Flow and Combustion Control 2014, R. King editors, Springer-Verlag, Notes on Numerical Fluid Mechanics and Multidisciplinary Design, Vol. 127, (ISBN 978-3-319-11966-3), pp. 381-396, 2015.
- A.2 C.A. Beattie and S. Gugercin. [Model Reduction by Rational Interpolation](#). Accepted to appear in Model Reduction and Approximation for Complex Systems, edited by P. Benner, A. Cohen, M. Ohlberger, and K. Willcox, 2014.
- A.3 S. Gugercin and J.-R. Li. [Smith-type methods for balanced truncation of large-sparse systems](#). *Dimension Reduction of Large-scale Systems*, P. Benner, G.H. Golub, V.L. Mehrman and D.C. Sorensen editors, Springer-Verlag, Lecture Notes in Computational Science and Engineering, Vol. 45 (ISBN 3-540-24545-6), Berlin/Heidelberg, 2005.
- A.4 A.C. Antoulas, C.A. Beattie and S. Gugercin. [Interpolatory model reduction of large-scale systems](#). *Efficient Modeling and Control of Large-Scale Systems*, J. Mohammadpour and K. Grigoriadis editors, Springer-Verlag, ISBN 978-1-4419-5756-6, 2010.

Journal Publications

- B.1 A.C. Antoulas, D.C. Sorensen, and S. Gugercin. [A survey of model reduction methods for large-scale systems](#). *Structured Matrices in Operator Theory, Numerical Analysis, Control, Signal and Image Processing, Contemporary Mathematics, AMS publications*, **280**:193-219, 2001.
- B.2 S. Gugercin, D.C. Sorensen, and A.C. Antoulas. [A modified low-rank Smith method for large-scale Lyapunov Equations](#). *Numerical Algorithms*, Vol. 32, Issue 1, pp. 27-55, January 2003.
- B.3 S. Gugercin, A.C. Antoulas, and H.P. Zhang. [An approach to identification for robust control](#). *IEEE Transactions on Automatic Control*, Vol: 48 Issue: 6, pp. 1109-1115, June 2003.
- B.4 S. Gugercin and A.C. Antoulas. [A survey of model reduction by balanced truncation and some new results](#). *International Journal of Control*, Volume: 77 Issue: 8, pp. 748-766, 2004.

- B.5 S. Gugercin and A.C. Antoulas. [Model reduction of large-scale systems by least squares](#). *Linear Algebra and its Applications*, Special Issue on Order Reduction of Large-Scale Systems, Vol. 415/2-3, pp. 290-321, 2006.
- B.6 S. Gugercin and K. Willcox. [Krylov projection framework for Fourier model reduction](#). *Automatica*, Vol. 44, No: 1, pp. 209-215, 2008.
- B.7 S. Gugercin. [An iterative SVD-Krylov based algorithm for model reduction of large-scale dynamical systems](#). *Linear Algebra and its Applications*, Vol. 428, No: 8-9, pp. 1964-1986, 2008.
- B.8 S. Gugercin, A.C. Antoulas and C.A. Beattie. [H₂ model reduction for large-scale linear dynamical systems](#). *SIAM Journal on Matrix Analysis and Applications*, Vol. 30, Issue: 2, pp. 609-938, 2008.
- B.9 C.A. Beattie and S. Gugercin. [Interpolatory projection methods for structure-preserving model reduction](#). *Systems and Control Letters*, Vol. 58, Issue: 3, pp. 225-232, 2009.
- B.10 C.A. Beattie, Z. Drmac and S. Gugercin. [A note on shifted Hessenberg systems and frequency response computation](#). *ACM Transactions on Mathematical Software*, Vol. 38, No.2, 2011.
- B.11 U. Baur, C.A. Beattie, P. Benner, and S. Gugercin. [Interpolatory projection methods for parameterized model reduction](#). *SIAM Journal of Scientific Computing*, Vol. 33, Issue: 5, pp. 2489-2518, 2011.
- B.12 C.A. Beattie, S. Gugercin and S. Wyatt. [Inexact solves in interpolatory model reduction](#). *Linear Algebra and Its Applications*, Special Issue dedicated to Danny Sorensen's 65th birthday, Vol. 436, Issue: 8, pp. 2916-2943, 2012. (Appeared on-line at <http://dx.doi.org/10.1016/j.laa.2011.07.015> in August 2011).
- B.13 S. Gugercin, R. V. Polyuga, C.A. Beattie and A. van der Schaft. [Structure-preserving tangential-interpolation based model reduction of port-Hamiltonian Systems](#). *Automatica*, Volume: 48, No: 9, pp. 1963-1974, 2012. (Accepted in 2011)
- B.14 K. Ahuja, E. de Sturler, S. Gugercin and R. Chang. [Recycling BiCG with an application to model reduction](#). *SIAM Journal on Scientific Computing*, Vol. 34, No: 4, pp. A1925-A1949, 2012.
- B.15 G. Flagg, C.A. Beattie and S. Gugercin. [Convergence of the Iterative Rational Krylov Algorithm](#). *Systems and Control Letters*, Vol. 61, Issue: 6, pp. 688-691, 2012.
- B.16 G. Flagg, C.A. Beattie and S. Gugercin. [Interpolatory H-infinity model reduction](#). *Systems and Control Letters*, Vol. 62, Issue: 7, pp. 567-574, 2013.
- B.17 G. Flagg and S. Gugercin. [On the ADI Method for the Sylvester Equation and the optimal H₂ points](#). *Applied Numerical Mathematics*, Vol. 64, pp. 50-58, 2013.
- B.18 B. Anic, C.A. Beattie, S. Gugercin and A.C. Antoulas. [Interpolatory weighted H₂ model reduction](#). *Automatica*, Volume 49, Issue: 5, pp. 1275-1280, 2013.
- B.19 S. Gugercin, T. Stykel and S. Wyatt. [Model Reduction of Descriptor Systems by Interpolatory Projection Methods](#). *SIAM Journal on Scientific Computing*, Vol. 35, Iss. 5, pp. B1010-B1033, 2013.
- B.20 G. Flagg and S. Gugercin. [Multipoint Volterra Series Interpolation and H₂ Optimal Model Reduction of Bilinear Systems](#). To appear in *SIAM Journal on Matrix Analysis and Applications*, 2015.
- B.21 P. Benner, S. Gugercin, and K. Willcox. [A Survey of Model Reduction Methods for Parametric Systems](#). *Submitted*, 2013.
- B.22 E. de Sturler, S. Gugercin, M. E. Kilmer, S. Chaturantabut, C. Beattie, and M. O'Connell. [Nonlinear Parametric Inversion using Interpolatory Model Reduction](#). *Submitted*, 2013.

- B.23 T. Breiten, C. Beattie, and S. Gugercin (2013). [Near-optimal Frequency-weighted Interpolatory Model Reduction](#). To appear in *Systems and Control Letters*, 2015.
- B.24 Z. Drmac, S. Gugercin and C.A. Beattie. [Quadrature-Based Vector Fitting for discretized \$H_2\$ Approximation](#). To appear in *SIAM Journal on Scientific Computing*, 2015.

Refereed Conference Proceedings

- C.1 S. Gugercin and A.C. Antoulas. [On the assignment of eigenvalues in LTI systems](#). *Proceedings of the 38th IEEE Conference on Decision and Control*, Vol. 1, pp. 486, Phoenix, AZ, USA, December 1999.
- C.2 S. Gugercin and A.C. Antoulas. [On consistency and model validation for systems with parameter uncertainty](#). *Proceedings of SYSID2000*, Santa Barbara, California, USA, June 2000.
- C.3 S. Gugercin and A.C. Antoulas. [A comparative study of 7 algorithms for model reduction](#). *Proceedings of the 39th IEEE Conference on Decision and Control*, Vol. 3, pp. 2367-2372, Sydney, Australia, December 2000.
- C.4 S. Gugercin, A.C. Antoulas, N. Bedrossian. [Approximation of International Space Station 1R and 12A Models](#). *Proceedings of the 40th IEEE Conference on Decision and Control*, Vol. 3, pp. 1515-1516, Orlando, Florida, USA, December 2001.
- C.5 A.C. Antoulas and S. Gugercin. [A new approach to model reduction which preserves stability and passivity](#). *Proceedings of the 41st IEEE Conference on Decision and Control*, Vol. 3, pp. 2544-2545, Las Vegas, NV, USA, December 2002.
- C.6 S. Gugercin and A.C. Antoulas. [A survey of balancing methods for model reduction](#). *Proceedings of European Control Conference 2003*, Cambridge, UK, September 2003. (This is an earlier version of the publication [B.4].)
- C.7 S. Gugercin and A.C. Antoulas. [A time-limited balanced reduction method](#). *Proceedings of the 42nd IEEE Conference on Decision and Control*, Vol. 5, pp. 5250-5253, Maui, HI, USA, December 2003.
- C.8 S. Gugercin and A.C. Antoulas. [An \$H_2\$ error expression for the Lanczos procedure](#). *Proceedings of the 42nd IEEE Conference on Decision and Control*, Vol. 2, pp. 1869-1872, Maui, HI, USA, December 2003.
- C.9 C.A. Beattie, S. Gugercin, A.C. Antoulas and E. Gildin. [Controller reduction by Krylov projection methods](#). *Proceedings of the 16th International Symposium on Mathematical Theory of Networks and Systems*, Katholieke Universiteit Leuven, Leuven, Belgium, July 2004.
- C.10 S. Gugercin, A.C. Antoulas, C.A. Beattie, and E. Gildin. [Krylov-based controller reduction for large-scale systems](#). *Proceedings of the 43rd IEEE Conference on Decision and Control*, Vol. 3, pp. 3074-3077, Paradise Island, Bahamas, December 2004.
- C.11 S. Gugercin. [An iterative SVD-Krylov based method for model reduction of large-scale dynamical systems](#). *Proceedings of the 44th IEEE Conference on Decision and Control, and The European Control Conference 2005*, pp. 5905-5910, Seville, Spain, December 2005. (This is an earlier version of the publication [B.7].)
- C.12 C.A. Beattie and S. Gugercin. [Krylov-based model reduction of second-order systems with proportional damping](#). *Proceedings of the 44th IEEE Conference on Decision and Control, and The European Control Conference 2005*, pp. 2278-2283, Seville, Spain, December 2005.

- C.13 C.A. Beattie, J. Borggaard, S. Gugercin and T. Iliescu. [A domain decomposition approach to POD](#). *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 6750-6756, San Diego, CA, USA, December 2006.
- C.14 C.A. Beattie and S. Gugercin. [Inexact solves in Krylov-based model reduction](#). *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 3405-3411, San Diego, CA, USA, December 2006. (Despite a similar name, [B.12] contains a significant reformulation and expansion of this publication.)
- C.15 S. Gugercin, A. C. Antoulas and C. A. Beattie. [A rational Krylov iteration for optimal \$H_2\$ model reduction](#). *Proceedings of the 17th International Symposium on Mathematical Theory of Networks and Systems*, pp. 1665-1667, Kyoto, Japan, July 2006. (This is the first publication where IRKA was introduced. The article [B.8] contains a significant reformulation and expansion.)
- C.16 C.A. Beattie and S. Gugercin. [Krylov-based minimization for optimal \$H_2\$ model reduction](#). *Proceedings of the 46th IEEE Conference on Decision and Control*, pp. 4385-4390, New Orleans, LA, USA, December 2007.
- C.17 C.A. Beattie and S. Gugercin. [Interpolation theory for structure-preserving model reduction](#). *Proceedings of the 47th IEEE Conference on Decision and Control*, pp. 4204-4208, Cancun, Mexico, December 2008. (This is an earlier version of the publication [B.9].)
- C.18 S. Gugercin, R. Polyuga, C.A. Beattie and, A. van der Schaft. [Interpolation-based \$H_2\$ model reduction for port-Hamiltonian systems](#). *Proceedings of the Joint 48th IEEE Conference on Decision and Control, and 28th Chinese Control Conference*, pp. 5362-5369, Shanghai, P.R. China, December 2009. (This is an earlier version of the publication [B.13].)
- C.19 C.A. Beattie and S. Gugercin. [A trust region method for optimal \$H_2\$ model reduction](#). *Proceedings of the Joint 48th IEEE Conference on Decision and Control, and 28th Chinese Control Conference*, pp. 5370-5375, Shanghai, P.R. China, December 2009.
- C.20 G. Flagg, S. Gugercin and C.A. Beattie. [An interpolation-based approach to \$H_\infty\$ model reduction of dynamical systems](#). *Proceedings of the 49th IEEE Conference on Decision and Control*, pp. 6791-6796, Atlanta, GA, USA, December 2010. (This in an earlier version of [B.16], which introduced a substantial modification to the computation of the reduced-model.)
- C.21 C. Magruder, C.A. Beattie, and S. Gugercin. [Rational Krylov methods for optimal \$L_2\$ model reduction](#). *Proceedings of the 49th IEEE Conference on Decision and Control*, pp. 6797-6802, Atlanta, GA, USA, December 2010.
- C.22 C.A. Beattie and S. Gugercin. [Weighted model reduction via interpolation](#). *Proceedings of the 18th IFAC World Congress*, pp. 12757-12760, Milano, Italy, August 28- September 2, 2011.
- C.23 C.A. Beattie, and S. Gugercin. [Structure-preserving model reduction of nonlinear port-Hamiltonian systems](#). *Proceedings of the 50th IEEE Conference on Decision and Control*, pp. 6564-6569, Orlando, FA, USA, 2011.
- C.24 J. Borggaard, E. Cliff and S. Gugercin. [Model reduction for indoor-air behavior in control design for energy-efficient Buildings](#). *Proceedings of the 2012 American Control Conference*, Montreal, Canada, June 2012.
- C.25 D. Kim, J. Braun, J. Borggaard, E. Cliff, S. Gugercin. [Coupled CFD/Building Envelope Model for the Purdue Living Lab](#). *Proceeding of the 2012 High Performance Buildings Conference at Purdue*, West Lafayette, IN, USA, July 2012.
- C.26 C.A. Beattie, and S. Gugercin. [Realization-independent \$H_2\$ -approximation](#). *Proceedings of the 51st IEEE Conference on Decision and Control*, Maui, HI, USA, December 2012.

- C.27 J. Borggaard, S. Gugercin, and Lizette Zietsman. [Compensators via H2-based Model Reduction and Proper Orthogonal Decomposition](#). *Proceedings of 19th IFAC World Congress*, 2014.

Other Publications

- D.1 C.A. Beattie and S. Gugercin. [CSE 2009: Theory, Algorithms, Applications: Advances in Model Reduction](#), *SIAM News*, Vol. 42, No: 5, June 2009.
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INVITED TALKS

- E.1 University of Trier, Trier, Germany, June 2003.
E.2 Bilkent University, Ankara, Turkey, July 2003.
E.3 Sandia National Laboratories, Albuquerque, NM, USA, March 2004.
E.4 Oak Ridge National Laboratories, Oak Ridge, TN, USA, November 2004.
E.5 Bilkent University, Ankara, Turkey, August 4, 2005.
E.6 Computational Prototyping Group, MIT, Cambridge, USA, October 20, 2005.
E.7 Aerospace Computational Design Lab., MIT, Cambridge, USA, October 21, 2005.
E.8 Koc University, Istanbul, Turkey, July 3, 2007.
E.9 Bilkent University, Ankara, Turkey, June, 2008
E.10 Technical University Berlin, Institute for Mathematics, Berlin, Germany, November 2009.
E.11 Technical University Berlin, Numerical Mathematics Seminar, Berlin, Germany, November 2009.
E.12 Scientific Computing Seminar, Technical University of Chemnitz, Chemnitz, Germany, January 2010.
E.13 Department of Mathematics, Karlsruhe Institute for Technology, Karlsruhe, Germany, February 2010.
E.14 Institute for Computational Mathematics, Technical University of Braunschweig, Braunschweig, Germany, February 2010.
E.15 Technical University Berlin, Numerical Mathematics Seminar, Berlin, Germany, April 2010.
E.16 Department of Mathematics, University of Zagreb, Zagreb, Croatia, May 2010.
E.17 Naval Research Laboratory, Oceanography Division, Stennis Space Center, Stennis, MS, November 2010.
E.18 Inverse Problems Seminar, Virginia Tech., Blacksburg, VA, March 2011.
E.19 Max Planck Institute, Magdeburg, Germany, October 2011.
E.20 Department of Mathematics, Virginia Tech., Blacksburg, VA, August 2012.
E.21 Department of Computer Science, University of Maryland, College Park, MD, October 2012.
E.22 DAAD International School on Liner and Optimal Control, September 2013, Osijek, Croatia.
E.23 Keynote Speaker, The Opening Ceremony of the Berlin International Graduate School in Model and Simulation Based Research, Berlin, Germany, November 2014.

- E.24 ONERA (French Aerospace Research Center), Toulouse, France, November 2014.
 - E.25 Technical University Berlin, Berlin, Germany, November 2014
 - E.26 InformsVT Seminar, Virginia Tech, March 2014.
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TUTORIALS

- F.1 2010 IEEE Multi-Conference on Systems and Control, Kyoto, Japan, September 2010. “Recent Advances in Model Reduction of Large-Scale Systems” (with. A.C. Antoulas and T. Reis)
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INVITED CONFERENCE PRESENTATIONS:

- G.1 4th SIAM Conference on Linear Algebra in Signals, Systems and Control, Boston, MA, August 2001.
- G.2 SIAM Conference on Applied Linear Algebra, Williamsburg, VA, July 2003.
- G.3 Mini-workshop: Dimensional Reduction of Large-Scale Systems, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, October 2003.
- G.4 SIAM Conference on Computational Science and Engineering, Orlando, FL, USA, February 2005.
- G.5 SIAM Annual Meeting, New Orleans, LA, USA, July 2005.
- G.6 Workshop on Large-scale Robust Optimization, Santa Fe, NM, USA, Aug 31-Sep 2, 2005.
- G.7 Conference on Adaptive Model Reduction Methods for PDE Constrained Optimization, Rice University, Houston, TX, USA, May 17-19, 2006.
- G.8 Joint GAMM-SIAM Conference on Applied Linear Algebra, Duesseldorf, Germany, July 2006.
- G.9 SIAM Conference on Computational Science and Engineering, Costa Mesa, CA, February 2007.
- G.10 Workshop on Structured Perturbations, and Distance Problems in Matrix Computations, Mathematical Research and Conference Center in Bedlewo, Poland, March 2007.
- G.11 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 2007
- G.12 ENUMATH 2007, Graz, Austria, September 2007.
- G.13 15th ILAS Conference, Mexico, June 2008.
- G.14 Two invited talks at the 48th IEEE Conference on Decision and Control, December 2009.
- G.15 SIAM Annual Meeting, Pittsburgh, July 2010.
- G.16 Workshop on Control and Optimization with Differential-Algebraic Constraints, BIRS, Banff Center, Canada, 2010.
- G.17 SIAM Conference on Computational Science and Engineering, Reno, NV, February 2011.
- G.18 One of the four invited speakers at The Workshop on Advances in Model Reduction, University of Manchester, July 2011.
- G.19 Three invited talks at ICIAM 2011, Vancouver, Canada, July 2011.
- G.20 Workshop on Nonlinear Model Reduction, Tegernsee, Germany, May 2012.
- G.21 SIAM Applied Linear Algebra Meeting, Valencia, Spain, June 2012.

- G.22 CIRM Workshop on Model Reduction and Approximation of Complex Systems, Luminy, France, June 2013.
 - G.23 2014 SIAM Conference on Control and Its Applications, San Diego, July 2013.
 - G.24 MPI Model Reduction Workshop at Schloss Ringberg, Tegernsee, Germany, June 2014.
 - G.25 Active Flow and Combustion Control Conference, TU Berlin, Germany, September 2014.
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OTHER CONFERENCE PRESENTATIONS

Note: The IEEE Conference on Decision and Control Presentations and the SYSID2000 Presentation have resulted in proceedings listed under "Refereed Conference Proceedings" section as well.

- H.1 IEEE Conference on Decision and Control, Phoenix, AZ, USA, December 1999.
 - H.2 SYSID200, Santa Barbara, CA, USA, June 2000.
 - H.3 IEEE Conference on Decision and Control, Sydney, Australia, December 2000.
 - H.4 IEEE Conference on Decision and Control, Orlando, FL, USA, December 2001.
 - H.5 IEEE Conference on Decision and Control, Las Vegas, NV, USA, December 2002.
 - H.6 Two talks at IEEE Conference on Decision and Control, Maui, HI, USA, December 2003.
 - H.7 IEEE Conference on Decision and Control, Paradise Island, Bahamas, December 2004.
 - H.8 Householder Symposium XVI, PA, USA, May 2005.
 - H.9 IEEE Conference on Decision and Control, Seville, Spain, December 2005.
 - H.10 SIAM Annual Meeting, Boston, MA, USA, July 10-14, 2006.
 - H.11 Ninth Copper Mountain Conference on Iterative Methods, Copper Mountain, CO, USA, April 2-7, 2006.
 - H.12 IEEE Conference on Decision and Control, San Diego, CA, USA, December 2006.
 - H.13 IEEE Conference on Decision and Control, New Orleans, LA, USA, December 2007.
 - H.14 Tenth Copper Mountain Conference on Iterative Methods, CO, April 2008.
 - H.15 Householder Symposium XVII, Zeuthen, Germany, June 2008.
 - H.16 IEEE Conference on Decision and Control, Cancun, Mexico, December 2008.
 - H.17 SIAM Conference on Control and Its Applications (jointly held with SIAM Annual Meeting), July 2009.
 - H.18 2010 GAMM Annual Meeting, Karlsruhe, Germany, March 2010.
 - H.19 GAMM Dynamical System and Control Theory Meeting, Berlin, Germany, April 2010.
 - H.20 Householder Symposium XVIII, Lake Tahoe, CA, June 2011.
 - H.21 IEEE Conference on Decision and Control, Orlando, FL, December 2011.
 - H.22 Second International Workshop on Model Reduction for Parameterized Systems, Günzburg, Germany, October 2012.
 - H.23 2013 SIAM Conference on Computational Science and Engineering, Boston, February 2013.
 - H.24 Model Reduction of Complex Dynamical Systems, December 2013, Magdeburg, Germany.
 - H.25 Householder Symposium XIX, Belgium, June 2014.
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TEACHING EXPERIENCE

Rice University: ECE 501: Approximation of large-scale dynamical systems

Jacobs University Bremen: EE 201: Signals and Systems

Virginia Tech:

MATH 2984H: Mathematics in a Computational Context

MATH 2224: Multivariable Calculus

MATH 2214: Introduction to Differential Equations

MATH 2214H: Introduction to Differential Equations – Honors Sections

MATH 3054: Programming and Mathematical Problem Solving

MATH 3144: Linear Algebra

MATH 4445: Introduction to Numerical Analysis I

MATH 4446: Introduction to Numerical Analysis II

MATH 5414: Approximation of Dynamical Systems

MATH 5465: Numerical Analysis I

MATH 5466: Numerical Analysis II

STUDENT AND POSTDOC SUPERVISION

Postdoctoral Research Associate Supervision

- Sonja Schmelter (2007)
- Ulrike Baur (2009)
- Saifon Chaturantabut (2011-2013)

Ph.D. Student Supervision

- Garret Flagg, (Ph.D. 2012)
Ph.D. Dissertation: Interpolation Methods for Model Reduction of Bilinear Systems.
Currently working for Schlumberger/WesternGeco in Houston, TX as a Research Geophysicist
- Sarah Wyatt, (Ph.D. 2012)
Ph.D. Dissertation: Issues in Interpolatory Model Reduction: Inexact Solves, Second-order Systems and DAEs.
Currently working for Indian River State College in Fort Pierce, FL as a Tenure-Track Assistant Professor.

Masters Student Supervision

- Branimir Anic, (M.S. 2008)
M.S. Thesis: An interpolation-based approach to the weighted- H_2 model reduction problem.
Currently pursuing a Ph.D. in Mathematics at Karlsruhe Institute of Technology.
- Garret Flagg (M.S. 2009)
M.S. Thesis: An Interpolation-based Approach to Optimal H_∞ Model Reduction.

- Sarah Wyatt (M.S. 2009)
M.S. Thesis: Inexact Solves in Interpolatory Model Reduction.
- Caleb Magruder (M.S. 2013)
M.S. Thesis: Model Reduction of Linear Time-Periodic Dynamical Systems

Undergraduate Student Research Project Supervision

- Jennifer Meister (Spring 2007): Singular Value Decomposition and Some Applications
- Harold Metz and Patrick Sheridan (Fall 2008 and Spring 2009): A pole-residue framework for optimal H_2 model reduction.
- Christian Zinck (Fall 2010): Model Reduction using IRKA with Newton's Method and Convergence Criteria Analysis.
- Caleb Magruder (Fall 2010 and Spring 2011): Model Reduction of Inhomogenous Initial Conditions. (This research project won the Layman Prize for Undergraduate Research in Mathematics in 2011)
- Andy Lassiter (Spring, Summer and Fall 2012): Using Singular Value Decomposition for image reconstruction from noisy or missing data.
- Wenqi Hu (Fall 2013 and Spring 2014): Model Reduction: Theory and Applications
- Mark Brandao (Fall 2013): Rational Approximation and Model Reduction
- Michael Brennan (Fall 2014): Implementation of Parametric Model Order Reduction using Loewner Framework and Iterative Rational Krylov Algorithm.

Current Students

- Alex Grimm (Ph.D. Student)
- Allen Lattimer (Ph.D. Student) (Co-advised with J. Borggaard)
- Walid Chaabene (M.S. Student)
- Will Frey (M.S. Student)
- Klajdi Sinani (M.S. Student)
- Michael Brennan (Undergraduate Research Supervision)

SYNERGISTIC ACTIVITIES

Faculty Advisor for the *Turkish Student Association at Virginia Tech* 2005-current

COLLABORATORS – CURRENT AND FORMER

Athanasios C. Antoulas	Electrical and Computer Engineering, Rice University, Houston, TX
Christopher A. Beattie	Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA

Ulrike Baur	Max Planck Institute, Magdeburg
Peter Benner	Max Planck Institute, Magdeburg
Tobias Breiten	Institute for Mathematics and Scientific Computing, University of Graz, Graz
Jeff Borggaard	Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA
Saifon Chaturantabut	Mathematics and Statistics, Thammasat University, Pathumthani, Blacksburg, VA
Eugene Cliff	Aerospace & Ocean Eng, Virginia Polytechnic Institute and State University, Blacksburg, VA
Eric de Sturler	Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA
Zlatko Drmac	Mathematics, University of Zagreb, Zagreb
Traian Iliescu	Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA
Misha Kilmer	Mathematics, Tufts University, Medford, MA
Jing-Rebecca Li	INRIA, Palaiseau Cedex
Rosty Polygua	ABN AMRO N.V. Bank, Amsterdam
Danny C. Sorensen	Computational and Applied Mathematics, Rice University, Houston, TX
Tatjana Stykel	Mathematics, University of Augsburg, Augsburg
Karen E. Willcox	Aeronautics & Astronautics, Massachusetts Institute of Technology, Cambridge, MA
Arjan van der Schaft	Mathematics and Computing Science, University of Groningen, Groningen