

CURRICULUM VITÆ

Hasina Akter

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EDUCATION

University of North Texas, Denton, TX

- Ph.D., Mathematics, August 2012
 - Dissertation Topic: *Real Analyticity of Hausdorff Dimension of Disconnected Julia sets of Cubic Parabolic Polynomials*
 - Dissertation Committee: Mariusz Urbański (advisor), Pieter Allaart, and William Cherry

Georg-August-Universität, Göttingen, Germany

- M.Sc., Mathematics, December 2005
 - Dissertation Topic: *Newton's Method on the Complex Exponential Function*
 - Dissertation Committee: Hartje Kriete (advisor) and Manfred Denker

University of Dhaka, Dhaka, Bangladesh

- M.Sc., Mathematics, July 2000
 - Dissertation Topic: *Duality of Linear Fractional Programming*
 - Dissertation Committee: Md. Ainul Islam (advisor) and Nazrul Islam

University of Dhaka, Dhaka, Bangladesh

- B.Sc., Mathematics, June 1998

WORK

January 2015 - present

- **North South University**, Dhaka, Bangladesh
 - Job title:
 - * January 2015 - April 2019 : Assistant Professor
 - * May 2019 - Present : Associate Professor
 - * July 2023 - Present : Additional Director - Teaching and Learning, IQAC

August 2012 - May 2014

- **Purdue University North Central**, Westville, IN, USA
 - Job title: Visiting Assistant Professor

January 2006 - August 2012

- **University of North Texas**, Denton, TX
 - Job title: Teaching Fellow

June 2002 - November 2005

- **Georg-August-Universität**, Göttingen, Germany
 - Job title: Student Coordinator

RESEARCH INTERESTS

Real and Complex Dynamical Systems, Ergodic Theory, Functions of Complex Variables, Geometric Measure Theory, Thermodynamic Formalism, Computational Fluid Dynamics and Coding Theory

PAPERS & PREPRINTS

- (with Zarin Akter, Preetom Nag, Md Mamun Molla, and G. Saha) *Assessing thermal and hydrodynamic performance of non-Newtonian nano-coolant flow through a porous backward-facing step channel with non-Darcian effects*, Results in Engineering (Elsevier) (SCOPUS). (IF:7.9) (SJR:Q1) 27 (2025) 106027.
- (with Shapla Akter, A. T. Meem, Md Mamun Molla, Souhail Souai, and Saiful Islam,) *Thermophoretic Effects on Thermosolutal Natural Convection in Concentric Cylindrical Systems*, Chinese Journal of Physics (Elsevier) (Scopus). (SJR:Q2) (IF:4.6) (28 March, 2025).
- (with Shapla Akter, Md Mahadul Islam and Md Mamun Molla) *Magnetohydrodynamic natural convection and sensitivity analysis of heat and mass transfer of non-Newtonian fluid in concentric cylinders with wall heat and mass flux*, Multiscale and Multidisciplinary Modeling, Experiments and Design, Volume 8, article number 55 (2025).
- (with Sharmin Sultana and Partha Pratim Dey) *An equivalence based classification of $[6, 3, 4]$ error correcting codes over $GF(5)$* , Journal of Discrete Mathematical Sciences and Cryptography, Volume 25, Issue 5 (2022), pp 1425-1434.
- *Real Analyticity of Hausdorff Dimension Function of Disconnected Julia Sets of Parabolic Polynomials $f_{a,b}(z) = z(1 - az - bz^2)$* , GANIT J. Bangladesh Math. Soc. (ISSN 1606-3694) 38 (2018), pp 119-125.
- *Dynamics of the family of Quadratic Polynomials $g_\lambda(z) = z(1 - \lambda z)$, $\lambda \in \mathbb{C} \setminus \{0\}$* , Jahangirnagar Journal of Mathematics and Mathematical Sciences, J. J. Math. and Math. Sci., Vol. 31 (2018), pp 61-66.
- (with Partha Pratim Dey and M. Asifuzzaman) *Error Correcting $[5, 2]$ Codes over $GF(5)$* , Conference Proceedings, iLab Australia, 2018.
- (with Md. Zahangir Hossain and Partha Pratim Dey) *A Classification of $[6, 3, 4]$ Error Correcting Codes over $GF(4)$* , Far East Journal of Mathematics, Volume 106, number 2(2018), pp 441-449.
- (with M. Urbański) *Real Analyticity of Hausdorff Dimension of Julia Sets of Parabolic Polynomials $f_\lambda(z) = z(1 - z - \lambda z^2)$* , Illinois J. Math, Volume 55, Number 1(2011).
- *Newton's Method on the Complex Exponential Function*, M.Sc. Thesis, Georg-August-Universität, Göttingen, Germany, 2005
- *Duality of Linear Fractional Programming*, M.Sc. Thesis, University of Dhaka, Bangladesh, 2000

PRESENTATIONS

- **December 2019:** (Ongoing) 20 minutes invited talk on our paper *Connectivity of the Julia Sets of Cubic Polynomials $f(a,b)(z) = z(1 - az - bz^2)$* , 21st BMS International Mathematics Conference 2019, University of Dhaka, Dhaka, Bangladesh, December 6-8, 2019.
- **March 2018:** 20 minutes invited talk on our paper *Error Correcting $[5, 2]$ Codes over $GF(5)$* , 5th International Conference on Natural Science and Technology, Asian University for Women, Chittagong, Bangladesh, March 30-31, 2018.

- **December 2017:** 20 minutes invited talk on our paper *A Classification of* [6, 3, 4] *Error Correcting Codes over* $GF(4)$, 20th International Math Conference 2017, University of Dhaka, Dhaka, Bangladesh, December 8-10, 2017.
- **October 2015:** 60 minutes talk on *Fractals in Nature*, Bi-weekly Seminar, Department of Mathematics and Physics, North South University, Dhaka, Bangladesh
- **March 2013:** 20 minutes invited talk on my paper *Real Analyticity of Hausdorff Dimension of Disconnected Julia Sets of Parabolic Polynomials* $f_\lambda(z) = z(1 - z - \lambda z^2)$, AMS Special Session on Fractal Geometry and Ergodic Theory at the Spring Southeastern Sectional Meeting, University of Mississippi, Oxford, MS, March 1-3, 2013
- **October 2012:** 50 minutes talk on *Dynamics of Quadratic Polynomials* $z \mapsto z^2 + c$, Purdue University North Central, Math Club Meeting, Westville, Indiana, USA
- **March 2012:** 20 minutes invited talk on my paper *Real Analyticity of Hausdorff Dimension of Julia Sets of Parabolic Polynomials* $f_\lambda(z) = z(1 - z - \lambda z^2)$, AMS Special Session: Geometry and Analysis on Fractal Spaces at the Spring 2012 Western Section Meeting of the AMS, University of Hawaii at Manoa, Honolulu, Hawaii, USA
- **January 2012:** Poster presentation on my paper *Real Analyticity of Hausdorff Dimension of Julia Sets of Parabolic Polynomials* $f_\lambda(z) = z(1 - z - \lambda z^2)$, Joint Mathematics Meetings, Boston, MA, USA
- **September 2011:** Poster presentation of my paper *Real Analyticity of Hausdorff Dimension of Julia Sets of Parabolic Polynomials* $f_\lambda(z) = z(1 - z - \lambda z^2)$, AWM Anniversary Conference, Brown University, Providence, Rhode Island, USA
- **February 2006:** Seminar presentation on the topic of my Master's thesis *Newton's Method on the Complex Exponential Function*, University of North Texas (UNT), Texas, USA
- **January 2005:** 20 minutes invited talk on *Newton's Method on the Complex Exponential Function*, at the International Conference on Applied Mathematics and Mathematical Physics (ICAMMP), Shah Jalal University, Sylhet, Bangladesh
- **July 2001:** 45 minutes invited talk on my M.Sc. Thesis *Duality of Linear Fractional Programming*, as a guest student of Master-plus-Program (Mathematics program for international students) at the seminar of Complex Dynamics, Georg-August-Universität Göttingen, Germany
- **UNT Dynamics and Analysis Seminar**
 - **Spring 2012:** UNT Dynamical Systems Seminar - 4 sessions on *Real Analyticity of Hausdorff Dimension of Julia Sets of Parabolic Polynomials* $f_\lambda(z) = z(1 - z - \lambda z^2)$
 - **Fall 2009:** Gibbs States and Equilibrium States - 2 sessions. Proof and examples (from G. Keller - Ergodic Theory)
 - **Spring 2009:** Random Recursive Constructions - 1 session (from paper: Random Recursive Constructions: Asymptotic Geometric and Topological Properties by R. D. Mauldin and S. C. Williams)
 - **Fall 2008:** Probability and Measure - 2 sessions on 'Law of large numbers and Central limit theorem'. Proof and examples (from John W. Lamperti, P. Billingsley)

CONFERENCES ATTENDED

- (Ongoing) 21st International BMS Math Conference 2019, University of Dhaka, Dhaka, Bangladesh, December 6-8, 2019.
- International DAAD Alumni Seminar 2019 on Fostering Rapid Growth of Decentralised Renewable Energy to Boost Energy Access in Developing Countries, March 24th - 31th, 2019 in Cottbus, Germany, followed by the participation in the world's leading trade fair for the industry Hannover Messe - 2019, April 1st - 6th, 2019 in Hanover, Germany

- 5th International Conference on Natural Science and Technology, Asian University for Women, Chittagong, Bangladesh, March 30-31, 2018.
- 20th International Math Conference 2017, University of Dhaka, Dhaka, Bangladesh, December 8-10, 2017.
- Workshop on Mathematics Education: Implementing Resources Focused on How Children Learn Mathematics, Purdue University North Central, Westville, IN, July 24, 2013
- Spring Southeastern Sectional Meeting, University of Mississippi, Oxford, MS, March 1-3, 2013
- Joint Mathematics Meetings, San Diego, CA, January 9 -12, 2013
- Logic, Dynamics and Their Interactions, with a Celebration of the Work of Dan Mauldin, University of North Texas, Denton, Texas, June 4-8, 2012
- 2012 Spring Western Section Meeting, University of Hawaii at Manoa, Honolulu, Hawaii, March 3-4, 2012
- Joint Mathematics Meetings, Boston, MA, January 4 -7, 2012
- Midwest Dynamical Systems Seminar, Indiana University-Purdue University Indianapolis, Indiana, October 14-16, 2011
- AWM Anniversary Conference, Brown University, Providence, September 17-18, 2011
- Rocky Mountain Dynamical Systems, Bingham Young University, Salt Lake, May 12-16, 2008
- Chaotic Properties of Dynamical Systems, Warwick University, August 20-24, 2007
- Holomorphic Dynamics, Warwick University, August 22-26, 2005
- International Conference on Applied Mathematics and Mathematical Physics (ICAMMP), Shah Jalal University, Sylhet, Bangladesh, January 4-7, 2005

AWARDS

- **North South University**, Dhaka, Bangladesh
 - “2nd Runner Up” award for presentation, Invited talk on March 31, 2018, Asian University for Women, Chittagong, Bangladesh.
- **University of North Texas**, Denton, TX
 - Student Government Association Raupé Travel Grant, March 2012
 - College of Arts & Sciences Travel Grant, January 2012
 - Summer UNT Scholarship, May 2010
 - UNT Scholarship, January 2010
 - USC Scholarship for Continuing Students, January 2009
 - Summer Research Support, June 2009
 - USC Scholarship for Continuing Students, August 2008
 - Summer Research Support, July 2008
 - Summer Research Support, June 2007
 - General Academic Scholarship, August 2006
- AMS Travel Grant for 2012 Spring Western Section Meeting, University of Hawaii at Manoa, Honolulu, Hawaii, March 2012
- NSF Fund for Midwest Dynamical Systems Seminar, Indiana University-Purdue University Indianapolis, Indiana, October 2011
- AWM Fund for AWM Anniversary Conference, Brown University, Providence, September 2011
- Funded participant, Rocky Mountain Dynamical Systems, Bingham Young University, Salt Lake, May 2008

- Funded participant, Chaotic Properties of Dynamical Systems, Warwick University, August 2007
- Funded participant, Holomorphic Dynamics, Warwick University, August 2005
- Funded participant, International conference on Applied Mathematics and Mathematical Physics (ICAMMP), Shah Jalal University, Sylhet, Bangladesh, January 2005

ACTIVITIES

- Coordinator, National Undergraduate Mathematics Olympiad Team, North South University, Dhaka, Bangladesh
- Coordinator, Pi-day Celebration Committee, North South University, Dhaka, Bangladesh
- Attending a session on "Women in Science" as a Guest Panel Speaker, 5th International Conference on Natural Science and Technology, Asian University for Women, Chittagong, Bangladesh, 2018.
- Mentoring the graduate students presenting posters at the AWM Workshop at Joint Mathematics Meeting, San Diego, CA, 2013
- Advising Undergraduate students to place them in appropriate Mathematics classes (Mathematics Placement Procedure), Summer 2008

REFERENCES

Mariusz Urbański (Ph.D. Advisor)
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