

# Aminur Rahman

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## RESEARCH INTERESTS

- Modeling, Analysis, and Experimentation.
- General Mathematical Interests: Dynamical Systems, Nonlinear Dynamics and Chaos, Bifurcations, Reduced Modeling.
- Current Interests: Cancer Biophysics, Walking Droplets, and Chaotic Logical Circuits.

## EDUCATION

May, 2017 **Ph.D. in Applied Mathematics**, *New Jersey Institute of Technology & Rutgers University, Department of Mathematical Sciences*, Newark, NJ.  
Advisor: Professor Denis Blackmore.  
Dissertation: *Qualitative Modeling and Analysis of Chaotic Logical Circuits and Walking Droplets: A Dynamical Systems Approach*

## PROFESSIONAL APPOINTMENTS

September 1, 2020 - Present **Acting Instructor**, *University of Washington*, Seattle, WA.

September 1, 2017 - August 31, 2020 **Postdoctoral Teaching and Research Scholar**, *Texas Tech University*, Lubbock, TX.  
Mentors: Souparno Ghosh and Ranadip Pal; NIH Grant #: 1R01GM122084

June 1 - August 8, 2008 **Lee Teng Particle Accelerator Physics Internship**, *Argonne National Laboratory, University of Chicago*, Argonne, IL.  
Mentor: Dr. Nicholas Sereno (Scientist)

## PUBLICATIONS

Key: Underline – corresponding author; **g**, **ug**, **hs** – mentoring (graduate student, undergraduate, high school); **▶** – highlighted publication

### REFEREED JOURNALS

- Dyn. Sys. Theory **19)** A. Rahman, D. Blackmore. The One-dimensional Version of Peixoto's Structural Stability Theorem: A Calculus-based Proof (Status: In Review – minor revisions)
- Dyn. Sys. Theory **18)** K. Murthy<sup>hs</sup>, I. Jordan<sup>ug</sup>, P. Sojitra<sup>ug</sup>, A. Rahman, D. Blackmore. Generalized Attracting Horseshoe in the Rössler Attractor. *Symmetry* **13**(1), 30 (2021); DOI: 10.3390/sym13010030 Invited special issue on Symmetry in Modeling and Analysis of Dynamic Systems.
- Fluids **▶ 17)** A. Rahman, D. Blackmore. Walking Droplets Through the Lens of Dynamical Systems. *Modern Physics Letters B* **34**(34) 2030009 (2020); DOI: 10.1142/S0217984920300094. Invited *World Scientific* review article.
- Cancer **▶ 16)** E. Kara<sup>g</sup>, A. Rahman, E. Aulisa, S. Ghosh. Tumor ablation due to inhomogeneous – anisotropic diffusion in generic 3-dimensional topologies. *Physical Review E* **102** 062425 (2020); DOI: 10.1103/PhysRevE.102.062425
- Bifurcation Theory **15)** A. Rahman, D. Blackmore. Interesting bifurcations inspired by walking droplet dynamics. *Communications in Nonlinear Science and Numerical Simulations* **90** 105348 (2020); DOI: 10.1016/j.cnsns.2020.105348.
- Cancer **14)** S.R. Dhruba, A. Rahman, R. Rahman, S. Ghosh, R. Pal. Recursive model for dose-time responses in pharmacological studies. *BMC Bioinformatics* **20**(Suppl 12):317 (2019); DOI: 10.1186/s12859-019-2831-4. Invited special issue on Computational Network Biology: Modeling, Analysis, and Control.

- Cancer ▶ **13)** [A. Rahman](#), S. Ghosh, R. Pal. Modeling of drug diffusion in a solid tumor leading to tumor cell death. *Physical Review E* **98** 062408 (2018); DOI: 10.1103/PhysRevE.98.062408.
- Fluids ▶ **12)** [A. Rahman](#). Standard map-like models for single and multiple walkers in an annular cavity. *Chaos* **28**(9) 096102 (2018); DOI: 10.1063/1.5033949. Invited special issue on Hydrodynamic Quantum Analogs.
- Dyn. Sys. Theory **11)** Y. Joshi, [D. Blackmore](#), A. Rahman. Generalized attracting horseshoes and chaotic strange Attractors. (Submitted, preliminary version on arxiv: <https://arxiv.org/abs/1611.04133>).
- Electronics ▶ **10)** [A. Rahman](#), I. Jordan<sup>ug</sup>, D. Blackmore. Qualitative models and experimental investigation of chaotic NOR gates and set/reset flip-flops. *Proceedings of the Royal Society A* **474** 1-19 (2018); DOI: 10.1098/rspa.2017.0111
- Bifurcation Theory ▶ **9)** A. Rahman, Y. Joshi, [D. Blackmore](#). Sigma map dynamics and bifurcations. *Regular and Chaotic Dynamics* **22**(6) 740-749 (2017); DOI: 10.1134/S1560354717060107. Invited special issue dedicated to the memory of Vladimir Arnold (1937 - 2010).
- Electronics **8)** [A. Rahman](#), D. Blackmore. Threshold voltage dynamics of chaotic RS flip-flops. *Chaos, Solitons & Fractals* **103C** 555-566 (2017); DOI: 10.1016/j.chaos.2017.07.014
- Fluids **7)** [A. Rahman](#), D. Blackmore. Neimark–Sacker bifurcation and evidence of chaos in a discrete dynamical model of walkers. *Chaos, Solitons & Fractals* **91** 339-349 (2016); DOI: 10.1016/j.chaos.2016.06.016
- Waves ▶ **6)** [R. Goodman](#), A. Rahman, M.J. Bellanich, C.N. Morrison. A mechanical analog of the two-bounce resonance of solitary waves: modeling and experiment. *Chaos* **25**, 043109 (2015); DOI: 10.1063/1.4917047
- Electronics **5)** [D. Blackmore](#), A. Rahman, J. Shah. Discrete dynamical modeling and analysis of the R-S flip-flop circuit. *Chaos, Solitons & Fractals* **42** 951-963 (2009); DOI: 10.1016/j.chaos.2009.02.032

## REFEREED CONFERENCE PROCEEDINGS

- Cancer **4)** A. Rahman, S.R. Dhruva S. Ghosh, R. Pal. Recursive model for dose-time responses in pharmacological studies. (2018); Proceedings of the Fifth International Workshop on Computational Network Biology: Modeling, Analysis, and Control.

## DISSERTATION

- Electronics, Fluids, Dynamical Systems **3)** A. Rahman, Qualitative Modeling of Chaotic Logical Circuits and Walking Droplets: A Dynamical Systems Approach. (2017) (link: <http://archives.njit.edu/vhlib/etd/2010s/2017/njit-etd2017-049/njit-etd2017-049.php>)

## Tutorials and National Lab Reports

- Math Pedagogy **2)** A. Rahman. SIAM-dswebtutorials: Peixoto’s Structural Stability Theorem (2013)
- Particle Accelerator **1)** A. Rahman, N. Sereno, H. Shang. Benchmarking the Multipass Beam-Breakup Simulation Code BI. OAG-TN-2008-029. (2008)

## MEDIA COVERAGE

- Cancer “Cancer mechanics: How physical cues influence cell migration, metastasis, and treatment”. *EurekaAlert!* February, 28, 2020, *Global Health News Wire* March, 2, 2020. Sourced publications: [14, 16, 17]

## MENTORING

### Graduate students

- 2021 - Present Katherine Owens (Department of Applied Mathematics, University of Washington): Mentoring with Ivana Bozic (UW - Amath) on the transport of CAR-T cells and the efficacy of immunotherapy.
- 2019 - 2021 Erdi Kara (Department of Mathematics and Statistics, Texas Tech University): Mentoring with Eugenio Aulisa (TTU - Math) on inhomogeneous - anisotropic drug diffusion in a tumor.
- 2018 Muhammad Shah Alam (Department of Mathematics and Statistics, Texas Tech University). Advisor: Angela Peace (TTU - Math). Title: Parameter Sensitivity Analysis of Dynamics of Ovarian Tumor Growth Model. Defended MS project: Nov. 2, 2018.

### Undergraduate students

- Autumn 2021 - Present Lindsey Gao (Department of Applied Mathematics, University of Washington): Mentoring on data analysis and machine learning techniques applied to Hydrodynamic Quantum Analogs.
- Spring 2021 - Present Levi Rhoden (Department of Mechanical Engineering, University of Washington): Continuing mentorship of my AMATH 499 student on developing experiments for and dynamical modeling of Hydrodynamic Quantum Analogs.
- Spring 2021 - Present Gonzalo Quinto (Department of Applied Mathematics and Department of Physics, University of Washington): Continuing mentorship of my AMATH 499 student on Dynamical Systems and Machine Learning techniques applied to Hydrodynamic Quantum Analogs.
- Fall 2019 - Spring 2021 Joel Garza (Department of Mechanical Engineering, Texas Tech University): Serving as mentor for the National Academy of Engineering Grand Challenges Scholars Program.
- Summer 2017 Parth Sojitra (Department of Electrical Engineering, New Jersey Institute of Technology): Mentoring, with my advisor (NJIT - Math), a summer provost scholar on developing “real-world” systems that replicate generalized attracting horseshoe dynamics.
- June 2015 - August 2017 Ian Jordan (Department of Electrical Engineering, New Jersey Institute of Technology): Mentoring, with my advisor (NJIT - Math), a summer provost scholar (2015 and 2016) and recipient of the NJIT phase II seed grant (2016) on designing and building chaotic electronic circuits.
- Summer 2015 Leila Wooten (Department of Mathematics, Bloomfield College): Mentoring, with my advisor (NJIT - Math), an NJIT summer McNair scholar on simulating and analyzing a 1D model for walking droplets.

### High school students

- Summer 2017 Karthik Murthy (Bridgewater–Raritan High School): Mentoring, with my advisor, a summer provost high school intern on developing “real-world” systems that replicate generalized attracting horseshoe dynamics.

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## SERVICE

### Organizing Minisymposia

- May 23-27, 2021 Co-organizer for minisymposium on *Nonlinear Dynamics of Fluid-Solid Interactions: from Physics to Biology* at the SIAM Conference on Applications of Dynamical Systems (DS21).
- May 19-23, 2019 Co-organizer for minisymposium on *Unusual Complexity in Applied Dynamical Models* at the SIAM Conference on Applications of Dynamical Systems (DS19).
- May 21-25, 2017 Co-organizer for minisymposium on *Exotic Bifurcations in Fluid and Granular Dynamics* at the SIAM Conference on Applications of Dynamical Systems (DS17).

### Reviewed papers and books for:

- CRC Press
- Journal of Biological Dynamics
- Communications in Nonlinear Science and Numerical Simulations
- Mechanics Research Communications (on regular reviewer list)
- Journal of Difference Equations and Applications (on regular reviewer list)
- Differential Equations and Applications

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## TEACHING EXPERIENCE

### HIGHLIGHTED COURSES

Among the courses below I **highlight** a few of note.

- Spring 2021 **Enrollment > 400**, University of Washington, AMATH 301, Beginning Scientific Computing. Taught a course on the theory and application of scientific computing in both MATLAB and Python with over 400 students from a variety of academic backgrounds. Supervised and mentored 6 TAs in grading, quiz development, and tutorial sessions.
- Summer 2019 **Study Abroad**, Texas Tech University, Math 3350 and 2360, Higher Mathematics for Engineers I (ODEs) and Linear Algebra. Lead Study Abroad Program for TTU Engineering students in Sevilla, España.
- Fall 2018 **Graduate course**, Texas Tech University, Math 5346, Advanced Topics In Applied Mathematics I: Dynamical Systems, Asymptotics, and Numerics. Developed and taught a graduate course on the techniques of traditional applied mathematics. Structured the course based on a final project in the form of a scientific article with double-blind peer review.

Spring 2015 **Excellence in Teaching Award**, *New Jersey Institute of Technology*, Math 491, Chaos Theory. Developed a course, as a PhD student, on chaos theory with a theoretical/computational component and a lab component. Lectures gained popularity on YouTube: [https://www.youtube.com/playlist?list=PLTgVJQEL0JdiHgc7CA11XYo\\_3cJx\\_ANmz](https://www.youtube.com/playlist?list=PLTgVJQEL0JdiHgc7CA11XYo_3cJx_ANmz). Won the NJIT 2016 Excellence in Teaching Award.

## GRADUATE COURSES

### Texas Tech University

Fall 2018 Math 5346 (Advanced Topics In Applied Mathematics I: Dynamical Systems, Asymptotics, and Numerics)

Fall 2018 Math 5360 (Practical Training in the Teaching of Undergraduate Mathematics)

## UNDERGRADUATE COURSES

### University of Washington

Spring 2021 AMATH 499 (Undergraduate Reading and Research: Hydrodynamic Quantum Analogs)

Spring 2021 AMATH 301 (Beginning Scientific Computing)

Autumn 2020 AMATH 481 (Scientific Computing)

Autumn 2020 AMATH 352 (Applied Linear Algebra and Numerical Analysis)

### Texas Tech University

Fall 2019 Math 2450 - 023 (Calculus III)

Fall 2019 Math 2450 - 012 (Calculus III)

Summer 19 Study Abroad: Math 3350 (Higher Mathematics for Engineers I)

Summer 19 Study Abroad: Math 2360 (Linear Algebra)

Summer 18 Math 3310 (Intro to Proofs)

Spring 2018 Math 4350 (Advanced Calculus I: Intro to Real Analysis)

Fall 2017 Math 3351 (Higher Mathematics for Engineers II)

### New Jersey Institute of Technology

Spring 2017 Math 112 - 014 (Calc II)

Fall 2016 Math 222 - 005 (ODE)

Fall 2016 Math 222 - 103 (ODE)

Fall 2015 Math 112 - 009 (Calc II)

Spring 2015 Math 491 - 695 (Chaos Theory)

Fall 2014 Math 222 - 009 (ODE)

Spring 2014 Math 112 - 018 (Calc II)

### Substitute/Recitation

- o New Jersey Institute of Technology: Math 110 (Precalculus), Math 111 (Calculus I), Math 112 (Calculus II), Math 139 (Trigonometry and Calculus), Math 222 (ODE), Math 332 (Complex Variables), Math 337 (Linear Algebra), Math 340 Lab (Numerical Methods Lab), Math 473 (Dynamical Systems), and Math 481/565 (Real Analysis).

- o University of Delaware: Math 241 (Calculus I).

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## HONORS AND AWARDS

2021 ► AMS - Simons Travel Grant

2021 ► First-place in the APS FECS poster award

2020 Runner-up in the APS GSNP Postdoctoral speaker award

2016 ► NJIT Excellence in Teaching

2013 Runner-up in the SIAM dsweb pedagogy contest

## EARLY CAREER TRAVEL AWARDS

- o SIAM Early Career Travel Award to attend SIAM-DS 2021

- o APS Braslau Family Grant to attend APS-March 2021

- o Early Career Travel awards from Dynamic Days: Dynamic Days 2018, 2019

- o Student Travel award from AMS: AMS Fall 2016

- o Student Travel award from SIAM: SIAM DS 2015

- Student Travel awards from NJIT GSA: SIAM DS 2013, JMM 2014, AMS Spring 2014, AMS Fall 2014, AMS Spring 2015, APS-DFD 2015

## TALKS

### INVITED

- May, 24, 2021 **Society for Industrial and Applied Mathematics Dynamical Systems 2021**, *Virtual Conference*.  
Diffusive behavior in hydrodynamic quantum analogs
- February 18, 2021 **University of Nebraska - Lincoln Mathbio Seminar**, *University of Nebraska*, Lincoln, NE.  
Physics-based models of cancer drug response in solid tumors: towards computer-aided treatment strategies
- March 2, 2020 **American Physical Society March Meeting**, *Virtual session held on March 4th due to cancelation of APS March*, GSNP, Postdoctoral speaker award finalist.  
Diffusive behavior in walking droplets
- January 24, 2020 **University of Kentucky Math Seminar**, *University of Kentucky*, Lexington, KY.  
Mathematically Tractable Models in a Complex World: From Physics to Biology.
- May 20, 2019 **Society for Industrial and Applied Mathematics Dynamical Systems 2019**, *Snowbird Resort*, Snowbird, UT.  
Simple Proofs of Chaos for Logical Circuit and Walking Droplet Models.
- April 16, 2019 **Rennes Physics Seminar**, *Université de Rennes*, Rennes, FR.  
Coupled transport-population models for drug distribution and tumor cell death.
- February 26, 2019 **TTU SIAM Chapter Early Career Colloquium**, *Texas Tech University*, Lubbock, TX.  
Mathematically tractable models in cancer biophysics and walking droplets
- January 9, 2019 **Purdue Mechanical Engineering Seminar**, *Purdue University*, West Lafayette, IN.  
Coupled transport-population models for drug distribution and tumor cell death.
- November 28, 2018 **TTU Applied Mathematics Seminar**, *Texas Tech University*, Lubbock, TX.  
Simple Transport - Population Models in Solid Tumors
- November 6, 2018 **TTU BioMathematics Seminar**, *Texas Tech University*, Lubbock, TX.  
Simple Transport - Population Models in Solid Tumors
- October 31, 2018 **TTU Applied Mathematics Seminar**, *Texas Tech University*, Lubbock, TX.  
Discrete Dynamical Models of Walking Droplets
- April 3, 2018 **NJIT MathBio Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
Tumor ablation through drug diffusion
- February 27, 2018 **TTU SIAM Chapter Young Scholar Symposium**, *Texas Tech University*, Lubbock, TX.  
Simple models in a complex world
- February 6, 2018 **TTU BioMathematics Seminar**, *Texas Tech University*, Lubbock, TX.  
Tumor Ablation Through Drug Diffusion
- May 21, 2017 **Society for Industrial and Applied Mathematics Dynamical Systems 2017**, *Snowbird Resort*, Snowbird, UT.  
Bifurcations in Walking Droplet Dynamics.
- February 22, 2017 **MIT Numerical Methods for PDEs seminar**, *Massachusetts Institute of Technology*, Cambridge, MA.  
Dynamical modeling and analysis of walking droplets and chaotic logical circuits
- February 8, 2017 **URI Dynamical Systems Seminar**, *University of Rhode Island*, South Kingstown, RI.  
Dynamical modeling and analysis of chaotic logical circuits and walking droplets
- November 14, 2015 **American Mathematical Society Sectional Conference Fall 2015**, *Rutgers University*, New Brunswick, NJ.  
Neimark-Sacker Bifurcation and Evidence of Chaos in a Discrete Dynamical Model of Walkers
- October 7, 2015 **NJIT Department of Mechanical and Industrial Engineering Colloquium**, *New Jersey Institute of Technology*, Newark, NJ.  
The Chaotic Ballet of Walking Droplets
- May 21, 2015 **LANL Center for Nonlinear Studies Seminar**, *Los Alamos National Laboratory*, Los Alamos, NM.  
A Scheme for Modeling and Analyzing the Dynamics of Logical Circuits



- May 18, 2015 **Society for Industrial and Applied Mathematics Dynamical Systems 2015**, *Snowbird Resort*, Snowbird, UT.  
A Scheme for Modeling and Analyzing the Dynamics of Logical Circuits
- March 7, 2015 **American Mathematical Society Sectional Conference Spring 2015**, *Georgetown University*, Washington DC.  
A Mechanical Analog and Discrete Modeling of the n-bounce Resonance of Solitary Waves
- November 8, 2014 **American Mathematical Society Sectional Conference Fall 2014**, *University of North Carolina*, Greensboro, NJ.  
Further Analysis of Discrete Dynamical Models of the RS Flip-Flop Circuit
- March 29, 2014 **American Mathematical Society Sectional Conference Spring 2014**, *University of Maryland Baltimore County*, Baltimore, MD.  
A Scheme for Modeling and Analyzing the Dynamics of Logical Circuits
- CONTRIBUTED**
- March 6, 2020 **American Physical Society March Meeting**, *Virtual session held on March 3rd due to cancelation of APS March*, GSOFT, **APS GSNP Postdoctoral speaker award finalist talks**.  
Diffusive behavior in walking droplets
- January 5, 2018 **Dynamic Days 2018**, *Denver Hilton City Center*, Denver, CO.  
The Chaotic Ballet of Walking Droplets.
- July 3, 2017 **Workshop on Wave-Particle Duality and Hydrodynamic Quantum Analogs**, *University of Liège*, Liège, BE.  
Dynamics of Discrete Dynamical Models of a Walker in an Annulus.
- January 4, 2017 **Joint Mathematics Meetings 2017**, *Hyatt Regency Atlanta and Marriott Atlanta Marquis*, Atlanta, GA.  
The Chaotic Ballet of Walking Droplets.
- September 24, 2016 **American Mathematical Society Sectional Conference Fall 2016**, *Bowdoin College*, Brunswick, ME.  
Neimark-Sacker bifurcations and evidence of chaos in a discrete dynamical model of walkers.
- June 21, 2016 **NJIT Graduate Student Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
A Tempest in The Mathematics of Time: A brief history of chaos and its appearance in walking droplets and electronic circuits.
- November 24, 2015 **American Physical Society 68th Annual Division of Fluid Dynamics Meeting**, *Hynes Convention Center*, Boston, MA.  
Neimark-Sacker Bifurcation and Evidence of Chaos in a Discrete Dynamical Model of Walkers
- June 11, 2015 **NJIT Graduate Student Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
Neimark-Sacker Bifurcation and Evidence of Chaos in a Discrete Dynamical Model of Walkers
- July 24, 2014 **NJIT Graduate Student Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
A Mechanical Analog of the Chaotic Scattering in Solitary Waves
- January 17, 2014 **Joint Mathematics Meetings 2014**, *Baltimore Convention Center*, Baltimore, MD.  
Peixoto's structural stability theorem: The one-dimensional version
- January 15, 2014 **Joint Mathematics Meetings 2014**, *Baltimore Convention Center*, Baltimore, MD.  
A Scheme for Modeling and Analyzing the Dynamics of Logical Circuits
- June 21, 2013 **Mathematical Problems in Industry 2013**, *Worcester Polytechnic Institute*, Worcester, MA.  
Phase Field Formulation for Microstructure Evolution in Oxide Ceramics
- June 11, 2013 **NJIT Graduate Student Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
Peixoto's structural stability theorem: The one-dimensional version
- July 10, 2012 **NJIT Graduate Student Seminar**, *New Jersey Institute of Technology*, Newark, NJ.  
Logical circuits: A scheme for discrete modeling and analysis.
- April 20, 2011 **Hallenbeck Graduate Student Seminar**, *University of Delaware*, Newark, DE.  
Mechanical Chaotic Scattering: The Adventures in the Valley of Chaos
- October 20, 2010 **Hallenbeck Graduate Student Seminar**, *University of Delaware*, Newark, DE.  
A scheme for modeling and analyzing the dynamics of logical circuits

**CO-AUTHORED**

- November 5, 2019 **TTU BioMathematics Seminar**, *Texas Tech University*, Lubbock, TX.  
Tumor ablation due to inhomogeneous - anisotropic diffusion in generic 3 dimensional topologies

- May 22, 2017 **Society for Industrial and Applied Mathematics Dynamical Systems 2017**, *Snowbird Resort*, Snowbird, UT.  
 Presenter: Denis Blackmore; *Analysis of New Walking Droplet Bifurcations*
- January 4, 2017 **Joint Mathematics Meetings 2017**, *Hyatt Regency Atlanta and Marriott Atlanta Marquis*, Atlanta, GA.  
 Presenter: Ian Jordan; *Discrete dynamical modeling and experimental investigation of chaotic NOR gates and set/reset flip-flops.*
- May 20, 2013 **Society for Industrial and Applied Mathematics Dynamical Systems 2013**, *Snowbird Resort*, Snowbird, UT.  
 Presenter: Hao Wu; *Analysis and Simulation of the BSR Model*

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## POSTER PRESENTATIONS

- March 16, 2021 **American Physical Society March meeting**, *Virtual*, USA.  
 Physics-based models and simulations of cancer drug response in solid tumors. (First-place in of FECS poster award)
- February 27, 2021 **MAA Golden Section**, *Virtual*, West Coast, USA.  
 Mathematical Art Exhibition
- January 4-6, 2019 **Dynamic Days 2019**, *Hilton Orrington Hotel*, Evanston, IL.  
 Standard map-like models for single and multiple walkers in an annular cavity.
- October 6-11, 2018 **Congress of Neurological Surgeons 2018**, *Marriott Marquis*, Houston, TX.  
 A prospective analysis tool to assess potential success for extra-femoral mechanical thrombectomy;  
 Presenter: Mousa K. Hamad
- June 5-6, 2015 **Frontiers in Applied and Computational Mathematics 2015**, *New Jersey Institute of Technology*, Newark, NJ.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- May 22-23, 2014 **Frontiers in Applied and Computational Mathematics 2014**, *New Jersey Institute of Technology*, Newark, NJ.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- January 16, 2014 **Joint Mathematics Meetings 2014**, *Baltimore Convention Center*, Baltimore, MD.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- October 31, 2013 **Graduate Student Association Research Day 2013**, *New Jersey Institute of Technology*, Newark, NJ.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- May 31 - June 2, 2013 **Frontiers in Applied and Computational Mathematics 2013**, *New Jersey Institute of Technology*, Newark, NJ.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- May 21 - 23, 2010 **Frontiers in Applied and Computational Mathematics 2010**, *New Jersey Institute of Technology*, Newark, NJ.  
 A Scheme for Analyzing the Dynamics of Logical Circuits
- April 19, 2009 **NJIT Experience Day**, *New Jersey Institute of Technology*, Newark, NJ.  
 Discrete Dynamical Modeling and Analysis of the R-S flip-flop circuit
- April 8, 2009 **Dana Knox Student Research Showcase**, *New Jersey Institute of Technology*, Newark, NJ.  
 Discrete Dynamical Modeling and Analysis of the R-S flip-flop circuit
- March 29, 2009 **Garden State Undergraduate Mathematics Conference**, *Monmouth University*, Monmouth, NJ.  
 Discrete Dynamical Modeling and Analysis of the R-S flip-flop circuit
- May 19 - 21, 2008 **Frontiers in Applied and Computational Mathematics 2008**, *New Jersey Institute of Technology*, Newark, NJ.  
 Chaos of the R-S flip-flop circuit
- April 5, 2008 **NJIT Experience Day**, *New Jersey Institute of Technology*, Newark, NJ.  
 Chaos of the R-S flip-flop circuit

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## RESEARCH WORKSHOPS

- June 13-17, 2016 **Mathematical Problems in Industry 2016**, *Duke University*, Durham, NC.  
 Worked on Predicting Physician Triage; a problem from *Revon Systems*

- June 22 - 26, **Mathematical Problems in Industry 2015**, *University of Delaware*, Newark, DE.  
2015 Worked on “Desulfurization of Natural Gas for Fuel Cells”; a problem from *Bloom Energy*
- September 15 **Boston/Keio Universities Workshop 2014**, *Boston University*, Boston, MA.  
- 19, 2014 Workshop on current theoretical and industrial Dynamical Systems problems
- June 23 - 27, **Mathematical Problems in Industry 2014**, *New Jersey Institute of Technology*, Newark,  
2014 NJ.  
Worked on “Effects of Membrane Morphology on Separation Efficiency”; a problem from *Pall Corp.*
- June 17 - 21, **Mathematical Problems in Industry 2013**, *Worcester Polytechnic Institute*, Worcester,  
2013 MA.  
Worked and presented on “Phase Field Formulation for Microstructure Evolution in Oxide Ceramics”; a problem from *Corning*
- June 11 - 15, **Mathematical Problems in Industry 2012**, *University of Delaware*, Newark, DE.  
2012 Worked on “The Use of Viscous Shear in Air Bearing Gaps for Precise Web Tension and Temperature Control”; a problem from *New Way Air Bearings*
- June 5 - 8, **Graduate Student Math Modeling Camp 2012**, *Rensselaer Polytechnic Institute*, Troy,  
2012 NY.  
Worked on “Modeling a cylindrical plunger viscometer”; a problem presented by *Professor Kara Maki*
- June 12 - 17, **Mathematical Problems in Industry 2011**, *New Jersey Institute of Technology*, Newark,  
2011 NJ.  
Worked on “Dynamic tumor growth modelling”; a problem from *Novartis*
- June 11 - 12, **Graduate Student Math Modeling Camp 2011**, *New Jersey Institute of Technology*,  
2011 Newark, NJ.  
Worked on “Modeling Photon generation”; a problem from *Lucent*

## PROFESSIONAL AFFILIATIONS

- Society for Industrial and Applied Mathematics
- American Physical Society

## TECHNICAL SKILLS

- Programming (in order of experience): MATLAB, C++, Java, Python, MPI (novice)