Majid Bani-Yaghoub, Ph.D.

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Education

Ph.D. Applied Mathematics (2009) Carleton University, Ontario, Canada
M.Sc. Applied Mathematics (2006) Carleton University, Ontario, Canada
– Master's Student (2001-2002) University of Paderborn, Germany
B.Sc. Applied Mathematics (1997) University of Tabriz, Tabriz, Iran

Appointments

Professor of Applied Mathematics, August 2025 – Present
Division of Computing, Analytics & Mathematics, University of Missouri-Kansas City, MO

Associate Professor, August 2018 – Present
Division of Computing, Analytics & Mathematics, University of Missouri-Kansas City, MO

Assistant Professor, August 2012 – August 2018
Department of Mathematics and Statistics, University of Missouri-Kansas City, MO

Lecturer, September 2011 – August 2012
Department of Mathematics, Texas A&M University, TX

Postdoctoral Research Associate, January 2010 – January 2011 & June 2011- August 2011
College of Veterinary Medicine & Biomedical Sciences, Texas A&M University, TX

Visiting Assistant Professor, January 2011 – May 2011
Department of Mathematics, Texas A&M University, TX

Teaching Assistant, September 2006 – December 2009
School of Mathematics & Statistics, Carleton University, Ontario, Canada

Applied Mathematician, September 2006 – June 2009
Institute of Mental Health Research, Ottawa Royal Hospital, Ontario, Canada

Research Assistant, September 2004 – December 2009
School of Mathematics & Statistics, Carleton University, Ontario, Canada

Research Assistant, May 2003 – August 2003
Department of Mathematics and Statistics, University of Ottawa, Ontario, Canada

High School Teacher, June 1997 – January 2000
Technical High School and Sadra Senior High School, Tehran, Iran

Administrative Positions

Associate Director, July 2022 – August 2024
Division of Computing, Analytics & Mathematics, University of Missouri-Kansas City, MO

Department Chair, August 2019 – July 2022
Department of Mathematics and Statistics, University of Missouri-Kansas City, MO

Undergraduate Advisor, August 2012 – August 2019
Department of Mathematics and Statistics, University of Missouri-Kansas City, MO

Research Interests

Mathematical Modeling in Epidemiology and Biomedical Systems, Ordinary, Partial, and Delay Differential Equations, Nonlinear Waves, Digital Twin, and AI-enabled Modeling with Emphasis on Reliability and Uncertainty Quantification.

Editorial Boards

1. Guest Editor, (December 2025 – Present) Frontiers in Applied Mathematics and Statistics, Impact Factor 1.5, Co-Editors: Dr. Md Yusuf Sarwar Uddin (UMKC), Dr. Sara D Sony, Northwest Missouri State University, and Dr. Qiao Zhuang (UMKC) https://www.frontiersin.org/researchtopic/76523
2. Academic Editor (January 2025 – Present) PLOS ONE, Impact Factor 2.4, Established in 2013 https://journals.plos.org/plosone/
3. Guest Editor, (June 2025 – Present) "Advances in Infectious Disease Modeling" Mathematical Biosciences and Engineering https://www.aimspress.com/mbe/article/7008/special-articles
4. Managing Editor (June 2022 – Present), Missouri Journal of Mathematical Sciences, Impact Factor 0.67, Established in 1988 https://projecteuclid.org/journals/missouri-journal-of-mathematical-sciences

Pending, Active, and Completed Grants

a) Pending:

1. Principal Investigator, MECHANISM-AI: Multi-scale, Explainable Control and Hypothesis-driven Analysis of Nonlinear Biological Systems via Mechanistic AI, DOE Genesis $750,000
2. Co-Principal Investigator, REU Site: Summer Undergraduate Mathematics Research at the University of Missouri-Kansas City, NSF, $410,039.

b) Active:

1. Principal Investigator, An Iterative, Mechanism-Guided AI Framework for De Novo Peptide Modulation of TLR4-Mediated Pediatric Inflammation (2026) Children's Mercy Research Institute (CMRI) Project GENESIS White Paper, $25,000
2. Principal Investigator, Responsible Decision-Focused AI for Reducing Uncertainty in Pediatric Acute Care (2026), CMRI Project GENESIS White Paper, $25,000
3. Principal Investigator, Task-Specific AI Optimization of Pediatric X-Ray Dose to Prevent Radiation Overexposure While Preserving Diagnostic Sufficiency (2026), CMRI Project GENESIS White Paper, $25,000
4. Co-Principal Investigator, Graph-Enabled Pediatric Airway Digital Twin for Objective Diagnosis and Surgical Planning (2026), CMRI Project GENESIS White Paper, $25,000
5. Principal Investigator, Collaborative Research: Enhancing Mathematical Models to Investigate the Influences of Climate Change on Zoonotic Spillover (2023-2027), NSF Emerging Mathematics in Biology, $265,000. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2325267&HistoricalAwards=false

6. Faculty Participant, (2022-2026) Interdisciplinary Graduate Training through Research in Artificial Intelligence and Secure Networked Sensing to Mitigate the Crisis of Alcohol and Drug Abuse, NSF Research Traineeship (NRT), $2,999,999.00 https://www.nsf.gov/awardsearch/showAward?AWD_ID=2152057&HistoricalAwards=false

c) Completed:

7. Principal Investigator, Midwest Virtual Laboratory of Pathogen Transmission in Healthcare Settings MVL-PATHS, (2022-2025), NIH, National Center for Emerging and Zoonotic Infectious Diseases, Building Mathematical Modeling Workforce Capacity to Support Infectious Disease and Healthcare Research, $482,789. https://reporter.nih.gov/project-details/10618068
8. Principal Investigator, (2024-2025) The 9th SIAM Central States Section Annual Meeting at University of Missouri-Kansas City, October 5-6, 2024, NSF Conferences and Workshops in Mathematical Sciences, $32,500. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2421221&HistoricalAwards=false
9. Co-Principal Investigator, (2024-2025) Engineering and Mathematical Modeling of Novel Dual NET-MDM2 Targeting Nanomedicine for Neuroblastoma Therapy, UMKC Tier 1 Funding for Excellence proposal, $30,000. https://ors.umkc.edu/unpublished/resources/funding-for-excellence.html
10. Co-Principal Investigator, SCC-PG: Early Community Intervention for Neighborhood Revitalization Using Artificial Intelligence and Emerging Technologies, (2020-2022) NSF, IIS - S&CC: Smart & Connected Communities, $150,000. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1951971
11. Principal Investigator, Modeling plant-virus-vector coinfections and the effect of disease control strategies on plant yield, Center for Undergraduate Research in Mathematics, (2021-2022) $28,128. http://urmath.org/curm/
12. Co-Principal Investigator, Virtual Screening of Drug Database for Effective Neuroblastoma Drug Repurposing (2020-2021) UMKC Collaborative Data Science Grant, $25,000. https://ors.umkc.edu/unpublished/resources/funding-for-excellence.html
13. Principal Investigator, UMKC Francis M. Bernardin Research Development Grant (2019-2020) UMKC College of Arts & Sciences $4,000. https://www.umkc.edu/cafe/about-us/awards-calendar.html
14. Applied Mathematician, Pediatric Comparison of Endoscopic and Non-endoscopic Gastrostomy Techniques, (2018-2019) Hereditary Polyposis Multidisciplinary Clinic, Children's Mercy Kansas City, $10,000. https://www.childrensmercy.org/childrens-mercy-research-institute/about/research-administration/

15. Co- Principal Investigator, Bringing the Field of Applied Mathematics from Shadowed State to the Frontline Discipline (2015-2016) UMKC Faculty for Excellence Program, $35,558. https://ors.umkc.edu/unpublished/resources/funding-for-excellence.html
16. Principal Investigator, Modeling and Analysis of the Next Life Event: Relating Theory and Data, (2014-2016) H & R Block Research and Development, $60,000. https://www.hines.com/properties/hr-block-world-headquarters-kansas-city
17. Principal Investigator, A new methodology to measure long-term temporal changes in population interactions (2015-2017) University of Missouri Research Board $5,700. https://www.umsystem.edu/ums/red/fundingopps/funding_programs
18. Mathematician, Forecasting Recidivism: Time series models with accuracies higher than VRAG & SORAG (2007-2008) University of Ottawa Medical Research Fund, $34,146. https://www.uottawa.ca/faculty-medicine/research-and-innovation/research-initiatives/internal-funding-opportunities
19. Mathematician, Nonlinear dynamics, chaos theory and violent behaviors: an application of Mathematics to Criminology (2006-2007) University of Ottawa Medical Research Fund, $33,150. https://www.uottawa.ca/faculty-medicine/research-and-innovation/research-initiatives/internal-funding-opportunities

d) Not funded (Selected Proposals):

20. Principal Investigator, IMPAIR: Innovative Mathematical Modeling and Predictive Analytics for Antimicrobial-Resistant Infection Reduction, National Center for Emerging and Zoonotic Infectious Diseases, Modeling Infectious Diseases in Healthcare (MInD Healthcare) to Improve Pathogen Prevention and Healthcare Delivery (2026-2030) $3,215,291.
21. Principal Investigator, Developing New Generation of Computational Models to Forecast Growth and Spread of Emerald Ash Borer and Identify Optimal Control Measures (2024-2027), USDA, $296,722.
22. Co-Principal Investigator, PIPP Phase II: Theme 2: Center for AI-Enabled One Health Predictive Modeling and Prevention (2024-2030), NSF PIPP-Pandemic Prevention, $18,000,000.
23. Co-Principal Investigator, A mathematical framework for testing AI reliability using high-order optimal Bayesian sequential design (2025-2028) NSF Mathematical Foundations of Artificial Intelligence (MFAI) $564,466.
24. Co-Investigator, Engineering and Mathematical Modeling of Novel Dual NET-MDM2 Targeting Nanomedicine for Neuroblastoma Therapy (2024-2025), National Institute of Child Health and Human Development, $419,075.
25. Principal Investigator, Collaborative Proposal: Integrating STEM + KC: Supporting the Region's NextSTEM Workforce S-STEM Track 3: Design & Dev- (2022-2027), National Science Foundation, $4,995,316,
26. Co-Principal Investigator, STEM Workforce Development and Internship Pipeline at UMKC, (2020-2023) DOD NDEP, $2,999,978

27. Co-Principal Investigator, Acute TBI Diagnostics and Monitoring (ATDM) in Austere Environments, (2020-2023) ADVANCED DOD TECH INTL, $1,988,176
28. Principal Investigator, A Novel Hybrid COVID-19 Modeling Approach to Increase Accuracies of Epidemiological Estimates and Predictions, (2020-2021) Medical CBRN Defense Consortium $150,764
29. Principal Investigator, Extending Wave Theory to Study Effects of Individual Behaviors on Disease Dynamics (2017-2022) NSF Faculty Early Career Development Program (CAREER), $386,976

Publications and Preprints

a) ***Articles in preparation:***

1. Sheedy, D.B., Aly, S.S.A., Bani-Yaghoub, M. (2025) Hybrid Agent-Based Modelling of Antimicrobial Resistance in Dairy Cows and their Environment.
2. Corkran, K., Bani-Yaghoub, M., Sutkin, G., Arjmand, A., and Paschal, S. (2025) Bayesian Inference of Hospital-Acquired MRSA Transmission Among Patients Declaring Drug Use at Admission, to be submitted to Journal of Hospital Infection
3. Corkran, K., Bani-Yaghoub, M., Sutkin, G., Arjmand, A., and Paschal, S. (2025) The Influence of Prior Antibiotic Use on MRSA Risk in Substance-Using and Non-Using Populations: A Comorbidity-Stratified Logistic Regression Analysis, to be submitted to Infection Control & Hospital Epidemiology
4. Bani-Yaghoub, M., Aktar, M.S., Yue, Y., Ou, C. (2025) Survival-Extinction Dynamics of the Invasive Emerald Ash Borer Under Extreme Cold Events and Predation
5. Pluta, J., Bani-Yaghoub, M., (2025) Integrating Health Equity into SIR Models of Medicaid and Medicare Nursing Homes
6. Bani-Yaghoub, M., Saha, B. Reed, A., Lee., J. (2025) Understanding the Long-Term Ecological Network of Kansas Rodents Under Extreme Weather Conditions
7. Saha, B., Bani-Yaghoub, M. Reed, A. (2025) Modeling the Impact of Extreme Weather Events on Zoonotic Disease Exposure: A Reaction-Diffusion Approach.
8. Romstad, M., Cheng, A., Allsworth, J., Rhee, N., Bani-Yaghoub, M., Sutariya, B. Adherence to the Enhanced Recovery After Surgery Protocol and 30-Day Readmissions After Elective Colorectal Cancer Surgery
9. Pennington, J., Bani-Yaghoub, M., Pithua, P, Aly, S., Using cattle movement data and stochastic epidemiological models to quantify the dynamics of Johne's disease.
10. Soysal, D., Bani-Yaghoub, M., A Modeling Framework to Characterize Recurrent Cycles of Math Anxiety

b) ***Articles submitted or accepted for publication:***

11. Corkran, K., Bani-Yaghoub, M., Sutkin, G., Saha, B., Arjmand, A. (2026) Bayesian Inference of Hospital-Acquired MRSA Transmission Among Patients Declaring Substance Use at Admission, Journal of Hospital Infection (Submitted)

12. Zhuang, Q., Wang, T., Wanjiku, R., Bani-Yaghoub, M. Zhang, Z. (2026) Two-scale Neural Networks for Singularly Perturbed Dynamical Systems with Multiple Parameters, Results in Applied Mathematics (submitted)

13. Alanazi, M. Bani-Yaghoub, M., Zhuang, Q. (2026) Sparse Discovery of Distributed-Delay PDEs with Bayesian Optimization, Journal of Computational and Applied Mathematics (submitted)

14. Thomas, R., Bani-Yagoub, M., (2026) On the Limits of Interpretable Machine Learning in Quintic Root Classification, SN Computer Science (submitted) https://arxiv.org/abs/2602.23467

15. Lyza Iamrache, L., Rekab, K., Bani-Yagoub, M., Pluta, J., and Mehailia, A. (2025) A Markov Chain Modeling Approach for Predicting Relative Risks of Spatial Clusters in Public Health, Discover Public Health (accepted) https://arxiv.org/pdf/2512.19635

16. Golladay, S., Bani-Yaghoub, M (2025) Evaluating the Reasoning Abilities of LLMs on Underrepresented Mathematics Competition Problems, ACM Transactions on Intelligent Systems and Technology (submitted) https://arxiv.org/abs/2512.24505

17. Thota, R.C., Sara, S.M., Uddin, M.Y.S., Bani-Yaghoub, M., Sutkin, G., and Kasula, J. (2026) Estimating Individual Transmission Rates and Reproduction Numbers of Respiratory Diseases in Indoor Gatherings Using UWB-Based Location Data, Science Direct Smart Health (submitted)

18. Harris, B., Bani-Yaghoub, M (2025) Leveraging NCBI Genomic Metadata for Epidemiological Insights: Example of *Enterobacterales,* Health Informatics Journal (Submitted) https://arxiv.org/abs/2511.14826

19. Sony, S.D., Bani-Yaghoub, M., Arjmand, A. (2024) Model-Based Assessment of Mathematics Anxiety Interventions Among College Students. Journal of Interdisciplinary Mathematics (accepted)

20. Alanazi, M., Bani-Yaghoub (2025) LCT–SIND^{3}y: Sparse Identification of Nonlinear Distributed-Delay Dynamics via the Linear Chain Trick, Discrete and Continuous Dynamical Systems - Series B (submitted) https://arxiv.org/abs/2601.13536

21. Saha, B., Bani-Yaghoub, M., Pandit, P.S., Reed, A., Lee, J. (2025) Integrating Weather Shocks and Environmental Shifts in a Stochastic Eco-Epidemiological Framework of Zoonotic Spillover, Discrete and Continuous Dynamical Systems - Series B (submitted)

c) ***Articles published in refereed journals:***

18. Saha, B., Bani-Yaghoub, M., Podder C.N. (2026) Utility of Compartmental Models to Test the Competing Hypotheses of Pathogen Evolution and Human Intervention, Frontiers in Public Health https://doi.org/10.3389/fpubh.2025.1702428

19. Corkran, K., Bani-Yaghoub, M., Sutkin, G., Arjmand, A., and Paschal, S. (2025) Bayesian Inference of Nosocomial Methicillin-resistant Staphylococcus aureus Transmission Rates in an Urban Safety-Net Hospital, Journal of Hospital Infection 165, 163-170. https://doi.org/10.1016/j.jhin.2025.07.018

20. Bani-Yaghoub, M., Rekab, K. Pluta, J., Tabharit, S. (2025) Estimating the Relative Risks of Spatial Clusters Using a Predictor-Corrector Method, Mathematics, Computational and Applied Mathematics *13*(2), 180. https://doi.org/10.3390/math13020180 **(selected as 2025 Editor's choice article)**
21. Aktar, M.S. Bani-Yaghoub, M., Yue, Y., Ou, C., Ali, A.M. (2025) Understanding the impacts of extreme weather on biological control through traveling wave analysis of a prey-predator model, Scientific Reports 15, 39606 https://doi.org/10.1038/s41598-025-23368-2
22. Sekyere, P.S., Bani-Yaghoub, M., , Youan, B.B.C. (2025) Reaction-diffusion modeling of vascular tumor growth: Bifurcation, relapse, and therapy efficacy. Mathematical Biosciences and Engineering, 22(11): 2944-2987. https://doi.org/10.3934/mbe.2025109
23. Menta, K., Bani-Yaghoub, M., & Youan, B.B.C. (2025) Uncovering dual oscillatory regimes in p53-mdm2 dynamics: A data-driven modeling approach with implications for cancer suppression, BioSystems https://doi.org/10.1016/j.biosystems.2025.105540
24. Alanazi, M., Bani-Yaghoub, M., Youan, B.B.C. (2025) Stable periodic solutions of a delayed reaction-diffusion model of Hes1-mRNA interactions, Mathematical Biosciences and Engineering, 22(8): 2152-2175. https://doi.org/10.3934/mbe.2025079
25. Arjmand, A., Bani-Yaghoub, M., Sutkin, G., Corkran, K., and Paschal, S. (2025) Comparative Analysis of Machine Learning Models for Predicting Hospital- and Community-Associated Urinary Tract Infections Using Demographic, Hospital, and Socioeconomic Predictors, Journal of Hospital Infection https://doi.org/10.1016/j.jhin.2025.04.024
26. Arjmand, A., Bani-Yaghoub, M., Corkran, K., Pandit, P., and Aly, S.S. (2025) Assessing the Impact of Biosecurity Compliance on Farmworker and Livestock Health within a One Health Modeling Framework, One Health https://doi.org/10.1016/j.onehlt.2025.101023
27. Corkran, K. Gomez, J.P. Arjmand, A., Nuño, M.A., Bani-Yaghoub, M. (2025) An Agent-Based Modeling Framework to Analyze Spread of Infection in A Network of Nursing Homes, BMC Infectious Diseases **25**, 635 https://doi.org/10.1186/s12879-025-10786-w
28. Sara, S. M., Thota, R. C., Uddin, M. Y. S., Bani-Yaghoub, M., Sutkin, G., & Abourraja, M. N. (2024). Patient flow modeling and simulation to study HAI incidence in an Emergency Department. *Smart Health*, *32*, 100467. https://doi.org/10.1016/j.smhl.2024.100467
29. Akinjole, O., Menta, K., Alsalhi, A., Bani-Yaghoub, M., & Youan, B. B. C. (2023). Novel Meta-iodobenzylguanidine and Etoposide Complex: Physicochemical Characterization and Mathematical Modeling of Anticancer Activity. AAPS PharmSciTech, 24(7), 174. https://doi.org/10.1208/s12249-023-02599-4
30. Anderson, B., Bani-Yaghoub, M., Kantheti, V., & Curtis, S. (2023). Using R to develop a corpus of full-text journal articles. Journal of Information Science, https://doi.org/10.1177/01655515231171362

31. Chang, Y., Rekab, K., Bani-Yaghoub, M., Mueller, M., (2023) Optimal threshold for static 99R Biometrics & Biostatistics International Journal, http://dx.doi.org/10.15406/bbij.2023.12.00387
32. Tran, T., Bani-Yaghoub, M., DeLisle, J.R. (2023) Non-emergency responses in the 311 system during the early stage of the COVID-19 pandemic: a case study of Kansas city Disaster Prevention and Resilience. 2, no.1: 3. http://dx.doi.org/10.20517/dpr.2022.08
33. Alqadi, H., Bani Yaghoub, M., Wu, S., Francisco, A., Balakumar, S. (2023) Prospective Spatial-Temporal Clusters of COVID-19 in Local Communities: Case Study of Kansas City, Missouri, United States. Epidemiol Infect. https://doi.org/10.1017/S0950268822000462
34. Leibsle, F.M., Rhee, N., Bani-Yaghoub, M. (2022) A matrix-eigenvalue method to compute Sturm-Liouville polynomials, Missouri Journal of Mathematical Sciences, 34 (1) 19-30 https://doi.org/10.35834/2022/3401019
35. Rhee, N., Bani-Yaghoub, M. Leibsle, F.M., (2022) Computing the associated Legendre polynomials through a matrix-eigenvalue algorithm, Missouri Journal of Mathematical Sciences, 34 (1) 30-39 https://doi.org/10.35834/2022/3401030
36. Alqadi, H., Bani-Yaghoub, M. (2022) Incorporating global dynamics to improve the accuracy of disease models: Example of a COVID-19 SIR model, PloS one 17.4 https://doi.org/10.1371/journal.pone.0265815
37. Soysal, D., Bani-Yaghoub, M., & Riggers-Piehl, T. A. (2022). Analysis of Anxiety, Motivation, and Confidence of STEM Students During the COVID-19 Pandemic. International Electronic Journal of Mathematics Education, 17(2), em0684. https://doi.org/10.29333/iejme/11836
38. Soysal, D., Bani-Yaghoub, M., & Riggers-Piehl, T. A. (2022). A Machine Learning Approach to Evaluate Variables of Math Anxiety in STEM Students. Pedagogical Research, 7(2), em0125. https://doi.org/10.29333/pr/11978
39. Bani-Yaghoub, M., Wang, X., Aly, S. (2022) Spatio-temporal analysis of coinfection using wavefronts of *Escherichia coli O157:H7* in a dairy cattle farm, Journal of Computational and Applied Mathematics 406 https://doi.org/10.1016/j.cam.2021.113936
40. Alqadi, H., Bani-Yaghoub, M., Balakumar, S., Wu, S., Francisco, A. (2021) Assessment of Retrospective COVID-19 Spatial Clusters with Respect to Demographic Factors: Case Study of Kansas City, Missouri, United States. International Journal of Environmental Research and Public Health 18, no. 21: 11496. https://doi.org/10.3390/ijerph182111496
41. Huang, C., Huang, R., Bani-Yaghoub, M. (2021) Traumatic brain injury risk assessment with smart technology, Journal of Defense Modeling and Simulation https://doi.org/10.1177/15485129211008529
42. Djimadoumngar K-N., Adegoke J.O., Bani-Yaghoub, M. (2021) Population dynamics and precipitation effects on food security in the grain-producing region of the Republic of Chad,

International Journal of Environmental Studies
https://doi.org/10.1080/00207233.2021.1940532

43. Bani-Yaghoub, M., Ou, C., Yao, G. (2020) Delay-induced instabilities of stationary solutions in a single species nonlocal hyperbolic-parabolic population model, Discrete and Continuous Dynamical Systems, Series S, 13(9): 2509-2535 https://doi.org/10.3934/dcdss.2020195
44. Bani-Yaghoub, M., Wang, X., Pithua, P., Aly, S. (2019) Effectiveness of control and preventive measures influenced by pathogen trait evolution: Example of *Escherichia coli O157:H7,* Journal of Computational and Applied Mathematics, 362, 366-382 https://doi.org/10.1016/j.cam.2018.09.008
45. Kumar, A., Bani-Yaghoub, M., Rekab, K., Hall, M., Attard, T. (2019) Pediatric multicenter cohort comparison of percutaneous endoscopic and non-endoscopic gastrostomy technique outcomes, Journal of Investigative Medicine http://dx.doi.org/10.1136/jim-2019-001028
46. Baygents, G., Bani-Yaghoub, M. (2018) Cluster analysis of hemorrhagic disease in Missouri's white-tailed deer population: 1980-2013, BMC ecology 18 (1), 35 https://doi.org/10.1186/s12898-018-0188-6
47. Konboon M., Bani-Yaghoub M., Pithua P., Rhee N, Aly S. (2018) A nested compartmental model to assess the efficacy of paratuberculosis control measures on U.S. dairy farms. PLoS ONE 13(10): e0203190. https://doi.org/10.1371/journal.pone.0203190
48. Bani-Yaghoub, M. (2018) Numerical simulations of traveling and stationary wave solutions arising from reaction-diffusion population models with delay and nonlocality, International Journal of Applied and Computational Mathematics 4 (1), 28 https://doi.org/10.1007/s40819-017-0441-2
49. Bani-Yaghoub, M., Reed, A., (2018) A methodology to quantify the long-term changes in social networks of competing species, Ecological Modeling, 368, 147-157 https://doi.org/10.1016/j.ecolmodel.2017.10.011
50. Bani-Yaghoub, M., Elhomani, A., Catley, D. (2018) Effectiveness of Motivational Interviewing, Health Education and Brief Advice in a Population of Smokers Who Are Not Ready to Quit. BMC Med. Res. Methodology, 18 (1), 35 https://doi.org/10.1186/s12874-018-0511-0
51. Maswood, M., Koleiny, A., Nickell, S., Wymer, L., Morris, R., Bani-Yaghoub, M., Adegoke, J. (2018) Missouri Spring Freeze Event and Crop Loss Analysis for the Years 1982-2015, 13 (2) https://doi.org/10.3844/ajabssp.2018.16.27
52. Rhee, N., Gora, P., Bani-Yaghoub, M. (2017) Predicting and Estimating Probability Density Functions of Chaotic Systems, Discrete and Continuous Dynamical System – B http://dx.doi.org/10.3934/dcdsb.2017144

53. Baygents, G., Bani-Yaghoub, M. (2017) A Mathematical Model to Analyze Spread of Hemorrhagic Disease in White-Tailed Deer Population Journal of Applied Mathematics and Physics 5 (11), 2327-4352 http://dx.doi.org/10.4236/jamp.2017.511184

54. Bani-Yaghoub, M. (2017) Approximating the traveling wavefront for a nonlocal delayed reaction-diffusion equation, Journal of Applied Mathematics and Computing, 53, 77-94 https://doi.org/10.1007/s12190-015-0958-7

55. Brown, T.W., M. Bani-Yaghoub, M. García-Mazcorro, J.F. (2017) Understanding the Competitive and Cooperative Interactions Between Probiotics and Autochthonous Intestinal Bacteria, Journal of Biosciences and Medicines 5, 63-80. http://dx.doi.org/10.4236/jbm.2017.54007.

56. Sadek, J., Bani-Yaghoub, M., Rhee, NH. (2016) Isogonal Conjugates in a Tetrahedron, Forum Geometricorum 16, 43-50 http://forumgeom.fau.edu/FG2016volume16/FG201606.pdf

57. Bani-Yaghoub, M., Rhee, N. and Sadek, J. (2016) An Algebraic Method to Find the Symmedian Point of a Triangle, Mathematics Magazine 89 (3): 197-200 https://doi.org/10.4169/math.mag.89.3.197

58. Bani-Yaghoub, M. (2016) Approximate Wave Solutions of Delay Diffusive Models Using a Differential Transform Method, Applied Mathematics E-Notes 16, 99-104 https://www.emis.de/journals/AMEN/2016/AMEN-151003.pdf

59. Bani-Yaghoub, M., Yao, G., Voulov, H. (2016) Existence and stability of stationary waves of a population model with strong Allee effect, Journal of Computational and Applied Mathematics 307, 385–393, https://doi.org/10.1016/j.cam.2015.11.021

60. Bani-Yaghoub, M., Yao, G., Fujiwara, M, Amundsen, D.E. (2015) Understanding the interplay between density dependent birth function and maturation time delay using a reaction-diffusion population model, Ecological Complexity, 21, 14-26 https://doi.org/10.1016/j.ecocom.2014.10.007

61. Bani-Yaghoub, M., Amundsen, D.E. (2015) Oscillatory traveling waves for a population diffusion model with two age classes and nonlocality induced by maturation delay, Computational and Applied Mathematics, 34 (1), 309-324 https://doi.org/10.1007/s40314-014-0118-y

62. Bani-Yaghoub, M., Yao, G., Reed, A., (2014) Modeling and Numerical Simulations of Single Species Dispersal in Symmetrical Domains, International Journal of Applied Mathematics 27 (6): 525-547 http://www.diogenes.bg/ijam/contents/2014-27-6/2/2.pdf

63. Gautam, R., Lahodny G, Bani-Yaghoub, M., Morley PS, Ivanek R. (2014) Understanding the role of cleaning in the control of *Salmonella* Typhimurium in grower-finisher pigs: a modelling approach, Epidemiol Infect. 142 (5) https://doi.org/10.1017/S0950268813001805

64. Gautam, R., Srinath, I., Clavijo, A., Szonyi, B., Bani-Yaghoub, M., Park, S., Ivanek, R. (2013) Identifying Areas of High Risk of Human Exposure to Coccidioidomycosis in Texas Using Serology Data from Dogs, Zoonoses Public Health. 60 (2):174-81 https://doi.org/10.1111/j.1863-2378.2012.01526.x

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67. Gautam, R., Bani-Yaghoub, M., Neill, W., H. Döpfer, D., Kaspar, C., W., Ivanek, R. (2011) Modeling the effect of seasonal variation in ambient temperature on the transmission dynamics of a pathogen with a free-living stage: Example of *Escherichia coli O157: H7* in a dairy herd, Preventive Veterinary Medicine, 102 (1):10-21. https://doi.org/10.1016/j.prevetmed.2011.06.008

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69. Bani-Yaghoub, M., Fedoroff, J.P., Curry, S., and Amundsen, D.E. (2010) A Time Series Modeling Approach in Risk Appraisal of Violent and Sexual Recidivism, Law and Human Behavior, 34 (5): 349-366. https://doi.org/10.1007/s10979-009-9183-y

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d) *Conference Article*

72. Thota, R. C., Sara, S. M., Uddin, M. Y. S., Bani-Yaghoub, M., and Sutkin, G. (2024) Accurate Estimation of Individual Transmission Rates Through Contact Analytics Using UWB-Based Indoor Location Data. *International Conference on Smart Applications, Communications and Networking (SmartNets)* (pp. 1-8). IEEE. https://ieeexplore.ieee.org/document/10577695

73. Thota, R. C., Uddin, Y. S., Bani-Yaghoub, M., Abourraja, M. N., Sutkin, G., & Paschal, S. (2025) Enhancing Agent-Based Models with Real-Time Movement Data to Assess Impacts of Biosecurity Interventions on Disease Exposure in Healthcare Settings. *Proceedings of the*

16th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (pp. 1-10). https://doi.org/10.1145/3765612.3767222

e) *Other published work*

74. Bani-Yaghoub, M. (2026) Model-informed Clinical Reasoning in Healthcare https://research.umkc.edu/files/bani/files/documents/virtual_lab_user-manual.pdf
75. Gharrawi, H.A., Bani-Yaghoub, M. (2022) Traffic Management in Smart Cities Using the Weighted Least Squares Method, 1-18 https://arxiv.org/abs/2205.00346
76. Bani-Yaghoub, M. (2017) Analysis and Applications of Delay Differential Equations in Biology and Medicine, arXiv:1701.04173, 1-23 https://arxiv.org/abs/1701.04173
77. Bani-Yaghoub, M. (2017) Introduction to Delay Models and Their Wave Solutions, arXiv:1701.04703, 1-20 https://arxiv.org/abs/1701.04703
78. Bani-Yaghoub, M., Reed, A., (2016) Social Network Analysis of a Grassland Rodent Community Using a Lotka-Volterra Modeling Approach, arXiv:1601.01935, 1-3 https://arxiv.org/abs/1601.01935
79. Fox, AM., Novak, K.J., and Bani-Yaghoub, M. (2015) Measuring the Impact of Kansas City's No Violence Alliance. Kansas City, MO: Department of Criminal Justice and Criminology, University of Missouri-Kansas City, 1-27 https://crimegunintelcenters.org/wp-content/uploads/2017/11/Measuring-the-impact-of-Kansas-Citys-No-Violence-Alliance.pdf
80. Bani-Yaghoub, M. (2014) Controlling Salmonella, Math exercise and the solution, *Calculus Early Transcendentals*, Sullivan, M. and Miranda, K. Chapter 8, W. H. Freeman, 564-565

f) *Preprints and Thesis works:*

81. Ford, W., Bani-Yaghoub, M., DeLisle, J.R., Tran, T., Never, B. (2022) Disparities in Municipal Services Characterized by Neighborhood Income, 1-26, Internal report prepared for KCMO.
82. Tran, T., Bani-Yaghoub, M., DeLisle, J.R., Ford, W., Never, B. (2021) Characteristic Changes in 311 Calls Due to the COVID-19 Global Pandemic, preprint, 12 pages.
83. Bani-Yaghoub, M., Li, M. (2015) Decision tree modeling and analysis of life events, technical report, H & R Block, preprint, 8 pages.
84. Bani-Yaghoub, M. (2009) Wave Solutions of Nonlocal Delayed Reaction-Diffusion Equations. Carleton University, Canada, 214 pages (PhD. Thesis). https://curve.carleton.ca/0f759d63-bedd-4597-94c6-7241988c5174
85. Bani-Yaghoub, M. (2007) On the traveling wave solutions of delayed non-local reaction-diffusion systems. Carleton University, 112 pages (Review article).
86. Bani-Yaghoub, M. (2006) A mathematical approach to axon formation in a network of signaling molecules for N2a cells. Carleton University, 93 pages (Master's Thesis). https://curve.carleton.ca/53d36543-8353-449c-8363-ac7f8f685af3

87. Bani-Yaghoub, M. (2004) Hopf bifurcation theorems and their applications, Preprint, University of Ottawa, Canada, 7 pages (Research Project, Supervisor: Dr. B. Dionne).

88. Bani-Yaghoub, M. (2003) Numerical analysis of a system of partial differential equations. Preprint, University of Ottawa, 16 pages (Research Project Supervisor: Dr. A. Novruzi).

g) *Posters (selected)*

1. Alanazi*, M. Bani Yaghoub, M. (2025) LCT–SIND^{3}y: Sparse Identification of Nonlinear Distributed-Delay Dynamics via the Linear Chain Trick with Applications in protein–RNA interaction * presenter https://www.stowers.org/events/stowers-research-conferences-protein-ai-3
2. Bani-Yaghoub, M. (2025) Real-Time Movement Data Collection and Agent-Based Model Enhancements to Understand Antimicrobial Resistance Dynamics in Healthcare Settings, NextGen PATHWAYS Symposium, Kansas City, https://www.umsystem.edu/nextgen/pathways
3. Langford*, L., Lee, J., Bani Yaghoub, M., Reed, A. (2024) Exploration of Zoonotic Diseases Spread by Rodents and the Relationships with Extreme Weather Events, AGU24 Annual Meeting, Advanced Earth and Space Science, 9 - 13 December 2024 in Washington, D.C. https://agu.confex.com/agu/agu24/meetingapp.cgi/Paper/1736557 * presenter
4. Langford*, L., Lee, J., Bani Yaghoub, M., Reed, A. (2024) A Spatiotemporal Modeling Approach to Explore the Relationships Between Zoonotic Disease and Extreme Weather Events. AEG's 2024 Annual Meeting, Philadelphia, PA, September 10-14, 2024: https://www.aegannualmeeting.org/ * presenter
5. Arjmand*, A., Bani-Yaghoub, M.(2024) Modeling E. coli Transmission Dynamics Across Environmental Interfaces: A Bayesian-Stochastic Approach. 21st Ecology and Evolution of Infectious Diseases Conference, Stanford University, Stanford, CA. https://kingcenter.stanford.edu/events/conferences-workshops/2024-ecology-and-evolution-infectious-diseases-eeid-conference * presenter
6. Bani-Yaghoub M., Konboon, M. (2019) Predictive Modeling and Applications of Infectious Disease Models to New Fields of Technology, OSPRES meeting at UMKC
7. Bani-Yaghoub, M. (2019) Using nonlinear wave theory to analyze microbial dynamics of free-living pathogens, Faculty Research Symposium at UMKC
8. Kumar, A.S., Bani-Yaghoub, M., Rekab, K., Hall, M., Attard T.M., (2018) Pediatric Tertiary Multicenter Cohort Comparison of Elective Gastrostomy Outcomes in Children, 51st Annual Meeting of ESPGHAN
9. Bani-Yaghoub, M. (2017) Analysis of invasive species using non-local delayed PDE models, Faculty Research Symposium at UMKC Mathematics and Statistics Department
10. Bani-Yaghoub, M. (2016) Applied Mathematics and Opportunities for Collaborations: Modeling, Simulation and Analysis, Faculty Research Symposium at UMKC Mathematics and Statistics Department
11. Rhee, N., Vaidya, N., Li, X., Bani-Yaghoub, M. (2016) Teaching and Learning Mathematical Techniques Through Real-life Research Activity, Interdisciplinary, Applied Mathematics Group, Faculty Research Symposium at UMKC Mathematics and Statistics Department

12. Bani-Yaghoub, M., Catley, D., (2016) Using Markov Chaining and Ordinary Differential Equation Models to Assess the effectiveness of Smoking Cessation Induction Interventions for Smokers Who Are Not Ready to Quit, 22nd Annual Meeting - Society for Research On Nicotine and Tobacco, Chicago, IL, USA
13. Bani-Yaghoub, M. (2015) A Hybrid Method to Approximate Traveling Wavefronts of Nonlocal Delayed Reaction –Diffusion Equations KUMU PDE, Dynamical Systems and Applications, University of Kansas, Lawrence, KS
14. Bani-Yaghoub, M. (2015) Using Markov Chain and Ordinary Differential Equation Models to Assess the Effectiveness of Smoking Cessation Interventions for Smokers Who Are Not Ready to Quit, UMKC Research Day, UMKC
15. Bani-Yaghoub, M., Reed, A., (2014) Detecting the Temporal Variations in the Social Networks of Kansas Rodents: Relating Theory and Data, UMKC Research Day, UMKC
16. Ivanek, I., Döpfer, D., Kaspar, C., Gautam, R., Bani-Yaghoub, M. et. al (2011) Transmissibility of infections caused by intermittently shed pathogens capable of environmental persistence
17. Gautam, R., Srinath, I., Bani-Yaghoub, M., Clavijo, A., Ivanek, R. (2010) Clustering of serologically diagnosed cases of Coccidioidomycosis among dogs in Texas. Conference of research workers in animal diseases. Chicago, IL.
18. Bani-Yaghoub, M., Gautam, R., Döpfer, D., Kaspar, C.W., Ivanek, R. (2010) Environmental decontamination and control of infectious disease: An SIS model, 10th Annual Red Raider Mini-Symposium; Texas Tech University Lubbock, TX, USA
19. Bani-Yaghoub, M., Fedoroff, J.P., Curry, S. and Amundsen, D.E, (2009) Decision Tree Methods versus Current Risk Assessment Techniques, IASR San Juan, Puerto Rico
20. Bani-Yaghoub, M., Fedoroff, J.P., Curry, S. and Amundsen, D.E, (2008) Classification and Regression Tree Analysis of Violent Offenders, 29th Annual University of Ottawa Research Day, Ottawa, Ontario, Canada.
21. Bani-Yaghoub, M., Fedoroff, J.P., Amundsen, D.E., Firestone, P., and Curry, S. (2007) Forecasting violent recidivism of sex offenders, A Time Series Modeling Approach, IASR, Vancouver, British Columbia Canada.

Awards and Scholarships

a) ***Research, Teaching and Travel Awards***

1. Research Award (Spring 2023) Star Researcher Award for the Number of Research Grants Awarded in STEM during 2022-2023, UMKC Office of Research Development
2. Mentoring Award (Spring 2022) Excellence in Mentoring Undergraduate Researchers, UMKC Office of Undergraduate Research and Creative Scholarship
   https://www.umkc.edu/cafe/about-us/oct2021facultyawards.html
   https://info.umkc.edu/awards/recipients/
3. Travel Award (Fall 2011) Third International Conference on Mathematical Modeling and Analysis, Trinity University, Texas
4. Travel award (Fall 2010) 10th Annual Red Raider Mini-Symposium, Texas Tech University

5. Travel award (Fall 2008) Biomathematics & Biostatistics Symposium, University of Guelph, Ontario, Canada, Fields Institute for Research in Mathematical Sciences
6. Outstanding Teaching award (Spring 1998) Technical High School, Tehran, Iran

b) Research and Teaching Scholarships

1. Graduate Scholarship (Fall 2006 – Winter 2009) Faculty of graduate studies, Carleton University, Ottawa, Ontario, Canada
2. Teaching Assistantship (Fall 2006 – Winter 2009) Faculty of graduate studies, Carleton University, Ottawa, Ontario, Canada
3. Research Assistantship (Fall 2004 – Winter 2009) School of Mathematics & Statistics, Carleton University, Ottawa, Ontario, Canada
4. Research Assistantship (Summer 2003) Department of Mathematics & Statistics, University of Ottawa, Ottawa, Ontario, Canada

c) Course Design and Sharing

1. Co-Principal Investigator, Course sharing for "Actuarial Theory for Pensions and Social Security", "Statistical Models in Actuarial Science", and "Life Contingencies". (2017-2019) MU System Intercampus Course Sharing grant, $28,227. https://www.umsystem.edu/ums/aa/intercampus_course_sharing
2. Principal Investigator, Course Redesign: Brief Calculus and Matrix Algebra, (2016-2017) UMKC Experiences in Undergraduate Research (EUReka) Initiative, $5,000. https://www.umkc.edu/undergraduate-research/faculty/eureka-course-development.html
3. Principal Investigator, Course Redesign: Calculus for Biological Sciences, (2014-2015) UMKC Experiences in Undergraduate Research (EUReka) Initiative, $5,000.
4. Principal Investigator, Introduction to Mathematical Biology for Honors Students (Summer 2012), Texas A & M Office of Honors, $2,000.

d) Other Support

5. Applied Mathematician, Applications of Infectious Disease Models to New Fields of Technology (2019-2020) OSPRES, $10,470.
6. "Overstreet lecture of science" program for Professor Carlos Castillo-Chavez's lecture "Beyond Ebola, Dengue, Influenza and Zika: Lessons learned for mitigating future pandemics" (2016), UMKC College of Arts and Sciences $1,050.

Presentations, Talks, and Colloquia

a) *Invited Research Talks*

1. April 2026, Leveraging Laboratory Data for Prediction and Clinical Decision Support Through AI and Computational Modeling, Children's Mercy Research Institute
2. October 2025, Dual Control of Lyme Disease and Emerald Ash Borer Under Climatic Forcing: A Hybrid ODE–PDE Model with Lévy Noise, Mini-symposium: "Infectious Disease in Space and Time: Advances in Mathematical Biology, Physiology, Public Health, and Spatial Analysis of Social Systems",10th Annual Meeting of SIAM Central States

Section, University of Arkansas, Fayetteville, Arkansas https://siam.uark.edu/

3. July 2025, Data-Driven Modeling of Farm – Community – Hospital Networks for Mitigating Antimicrobial Resistance, Models of Infectious Disease Agent Studies, MIDAS Network https://www.youtube.com/watch?v=UJ10PvCwu68
4. April 2025, Modeling One Health Strategies to Mitigate Antimicrobial Resistance, Advanced Analytics to Improve Infection Control & Prevention and Antimicrobial Stewardship, SHEA – The Society for Healthcare Epidemiology of America
5. April 2024, Understanding the Behaviors of Biological Waves Using Mathematical Models with Nonlocality, Mathematical Biology Seminar, Department of Mathematical Sciences, New Jersey Institute of Technology
6. January 2024, Enhancing Mathematical Models to Study the Effects of Extreme Weather Events on Wildlife, Clarkson University Applied Mathematics Colloquium https://youtu.be/jkbuMr7GMqk?si=5QoNG6sp6B_hh2M3
7. May 2023, Basic and individual reproduction numbers influenced by human behavior and uncertainty: Toward digital twin HAI modeling, CDC Healthcare, Infectious Diseases, Research Modeling
8. December 2022, Mathematical Modeling of Infectious Disease. Plenary Talk. International Science, Technology, and Engineering Conference (ISTEC) theme: Expanding Exploration in Science, Technology, and Engineering in the Post-Pandemic World
9. February 2020, Mathematical Models to Predict, Analyze and Simulate, Keynote Speaker of Midwest Math and Stats Student Conference, Northland Innovation Campus, Gladstone, MO
10. October 2019 Traveling and stationary waves of invasive species influenced by the interplay between the dispersal and maturation time delays, 5th Annual Meeting of SIAM Central States Section, Iowa State University, Ames, Iowa
11. March 2018, Theory and applications of nonlinear waves: Ecology of invasive species, UMKC Applied Mathematics Public Lecture Series
12. February 2018, A gentle introduction to theory and applications of nonlinear waves UMKC Applied Mathematics Public Lecture Series
13. October 2016, Travelling and stationary wave solutions of nonlocal delayed population models, UMKC Mathematics & Statistics Graduate Student Organization, "Faculty Presents Series"
14. September 2016, Stability of travelling and stationary waves arising from a delayed hyperbolic–parabolic population model, SIAM Central States Section 2nd Annual Meeting, University of Arkansas at Little Rock Little Rock, Arkansas
15. April 2015, Impacts of Allee effect and maturation time delay on dynamics of a nonlocal delayed reaction diffusion population model, SIAM Central States Section 1st Annual Meeting, Missouri University of Science and Technology, Rolla, MO
16. April 2014, Stability of wave solutions and the numerical simulations of a nonlocal delay reaction diffusion population model with two age classes, KU Computational and Applied Math Workshop, Mathematics Department, University of Kansas, Lawrence, KS

17. February 2012, Mathematical Modeling and Analysis in Neurology, Ecology and Epidemiology, Research Talk. Dept. of Mathematics & Statistics, University of Missouri-Kansas City
18. October 2011, Basic and Type- Reproduction Numbers for a Compartmental Model of an Infectious Disease with Free-Living Pathogen, 3rd International Conference on Mathematical Modeling, Trinity University, TX
19. February 2010, Modeling and Analysis of Crosstalk between Signaling Pathways, Quantitative Biology Seminar, Department of Mathematics Texas A & M University, TX
20. March 2010, Traveling and Stationary Wave Solutions of an Age-Structured Single Species Population Model, Applied Math Seminar, Dept. of Mathematics Texas A & M

b) Research Presentations (selected)

1. October 2025, Identifying p53-Modulating Compounds Using Data-Driven Modeling, Stowers Research Conference, Stowers Institute, Kansas City, Missouri, https://www.stowers.org/events/stowers-research-conferences-protein-ai-3
2. October 2024, Modeling the Impact of Climate Change on Intra- and Inter-Species Interactions Among Rodent Species, 9th Annual Meeting of SIAM Central States Section. Kansas City, Missouri
3. July 2024, One Health Modeling of Optimized Preventive and Control Measures to Reduce Health Disparities CDC Healthcare, Infectious Diseases, Research Modeling
4. October 2023, Leveraging Machine Learning Models to Identify Possible Outcomes of Discrete and Continuous Dynamical Systems, Advances in Computational Modeling of Infectious Diseases, 8th SIAM Annual Meeting of Central States Section, University of Nebraska-Lincoln
5. October 2023, Towards holistic modeling of invasive species, zoonotic diseases, and climate change, Bio-Control of Invasive Species by Studying Pest Dynamics and Additional Food Strategy, 8th SIAM Annual Meeting of Central States Section, University of Nebraska-Lincoln
6. October 2023, Building an Agent-Based Model to Simulate the Prevalence of Epidemics in Nursing Homes with Shared Staff, AMS, Fall Central Sectional Meeting Special Session on Mathematical modeling and analysis in ecology and epidemiology III
7. October 2023, Mathematical Modeling of Zoonotic Pathogen Spillover Triggered by Extreme Weather Events, AMS, Fall Central Sectional Meeting Special Session on Mathematical modeling and analysis in ecology and epidemiology III
8. August 2022, Billie Anderson* and Majid Bani-Yaghoub and Vagmi Kantheti and Scott Curtis, A Text Mining Approach to Determine Correlations Between the Spanish Flu and COVID-19, NLP and Text Analysis, Joint Statistical Meetings
9. October 2021, A new methodology to decompose multiple epidemic waves of infectious diseases tested by US COVID-19 data, SIAM Central States Section 6th Annual Meeting, University of Kansas, Laurance, Kansas
10. June 2021, Characterizing the spread of infection in cattle farms using wavefronts of a reaction-diffusion coinfection model, Society for Mathematical Biology Annual meeting, University of California-Riverside, California

11. March 2021, Necessary and Sufficient Conditions for Existence of Nonperiodic Solutions of Linear Discrete Dynamical Systems, Missouri Chapter of the Mathematical Association of America, Truman State University, Missouri
12. September 2019, Modeling & Prediction of Stochastic Data: Trends, Cycles and Patterns, OSPRES meeting, UMKC, Kansas City, Missouri
13. September 2018, A gentle introduction to stochastic and deterministic infections disease models: theory, applications and computing UMKC Applied Mathematics Public Lecture Series, Kansas City, Missouri
14. April 2018, Numerical Simulations of a Delayed Hyperbolic–Parabolic Population Model Midwest Numerical Analysis Day, University of Kansas, Lawrence, Kansas
15. October 2017, Transmission dynamics of emerging and zoonotic infectious diseases governed by the triad of ecology, evolution and anthropogenic activities, SIAM Central States Section 3rd Annual Meeting, Colorado State University Fort Collins, Colorado
16. October 2016, Efficacy of control and preventive policies applied to Johne's disease on dairy farms, SIAM Central States Section 2nd Annual Meeting, University of Arkansas at Little Rock Little Rock, Arkansas
17. October 2015, Ecology and Evolution of Wildlife Social Networks in a Grassland Community: An Application of Lotka-Volterra Modeling, The International Symposium on Biomathematics and Ecology, Illinois State University, Normal, IL
18. April 2015, Eco-evolutionary analysis of a multi-strain SIS model to quantify the long-term efficacy of control and preventive measures, SIAM Central States Section 1st Annual Meeting, Missouri University of Science and Technology, Rolla, Missouri
19. March 2014, Numerical Simulations of Reaction-Diffusion Models with Density Dependent Birth Function and Maturation Time Delay, 2014 Meeting of the Missouri Section of MAA, University of St. Louis, St. Louis, Missouri
20. March 2013, Geometry of weighted least squares solutions revisited Combined Section Meeting of the Missouri River Sections of MAA, Northwest Missouri State University, Maryville, Missouri
21. January 2013, Modeling and analysis of intermittently shed pathogens capable of environmental persistence. Joint Math Meeting AMS Session on Modeling Diseases, Populations, and Resources
22. September 2012, Challenges in computation of basic and type- reproduction numbers for disease models with free-living pathogen, UMKC Math & Stat Colloquium Series
23. January 2012, Approximation techniques for traveling waves of a single species delay diffusive model with age-structure and nonlocality. Joint Math Meeting, AMS Special Session on Nonlinear Analysis of Partial Differential Equation Models in Biology and Chemical Physics, II
24. January 2012, Dynamics of single species influenced by age-dependent dispersal and maturation time delay. Joint Math Meeting, AMS Session on Partial Differential Equations, III
25. May 2008, A novel approach in prediction of temporal risk variations. Institute of Mental Health Research Royal Ottawa Hospital, Ontario, Canada. (45 minutes)

26. September 2008, Numerical study of neuronal differentiation influenced by Retinoic Acid and Notch interaction, Biomathematics & Biostatistics Symposium, University of Guelph, Ontario, Canada.
27. March 2008, Pattern formation of reaction-diffusion systems: Destabilizing effect of interaction between signaling pathways. Bio Math Days: conference on mathematical modeling in the biological sciences, University of Ottawa, Ontario, Canada.
28. May 2007, Alternative methods in risk assessment and prediction of recidivism. Institute of Mental Health Research Royal Ottawa Hospital, Ontario, Canada
29. January 2006, The role of Retinoic Acid and Notch in the symmetry breaking instabilities for axon formation, Int. Conf. on Mathematical Biology and Ecology, Miami, Florida, USA.

c) Teaching Presentations (selected)

1. February 2025, AI-Enabled Faculty-Student Research Collaboration: Opportunities and Challenges, UMKC Preparing Future Faculty Program, School of Graduate Studies (50 min)
2. July 2020, Project-based learning across asynchronous and face-to-face landscapes. UMKC Preparing Roos to Offer Format Flexible Courses – UMKC PROFF presentation series, FaCET-Faculty Center for Excellence in Teaching (50 min)
3. October 2019, Letting Students Know About Pros and Cons of Step-by-step Online Calculators, Kansas City Mathematics Teaching Technology EXPO (50 min)
4. August 2018, EUReka! Courses (Experiences in Undergraduate Research), UMKC Faculty Center for Excellence in Teaching (FaCET) Fall 2018 Conference, (10 min)
5. April 2017, Incorrect Use of U-Substitution and Application of Residue Theorem to Evaluate Real Integrals, 3rd Annual Math and Stat Research Day at UMKC (30 min)

Professional Development, Training and Affiliations

a) *Professional Societies* (Current or former member)

1. The Society for Mathematical Biology (SMB)
2. Society for Industrial and Applied Mathematics (SIAM)
3. Mathematical Association of America (MAA)
4. American Mathematical Society (AMS)

b) Training Workshops

1. The Center for Undergraduate Research in Mathematics (CURM) Faculty workshop for undergraduate research, May 19 – 20, 2021
2. "Write Winning Grant Proposals" Workshop (David Morrison, Ph.D.) October 12, 2013

c) Professional Development

1. University of Missouri Faculty Scholars, AY 2014 – 2015 cohort Retreat #1 Building your Academic Portfolio, September 25-26, Retreat #2 Beyond Content and Expertise, February 15-16, Retreat #3 Teaching Excellence: Course design and Technology April 16-17

2. Intensive Course in Research Writing, Barbara Gastel, MD, MPH, Texas A&M University, Summer 2010

Teaching, Course Development, Supervised Student Research

a) Courses Taught since 2011.

Graduate Courses

1. Numerical Linear Algebra – Math 5532R, (Fall 2021)
2. Advanced Numerical Analysis I– Math 5532, (Fall 2017)
3. Advanced Numerical Analysis II – Math 5542, (Spring 2018, 2024)
4. Differential Equations – Math 5521 (Spring 2016, 2017, 2020, 2022)
5. Mathematical Methods in Data Science – Math 5545 (Spring 2021, 2025)
6. Math Methods in Sci. & Eng. – Math 5545 (Spring 2013, 2014, 2019)
7. Epi Modeling of Infectious Diseases – VIBS 689, co-taught with Dr. Ivanek, (Fall 2010)

Upper-level Undergraduate Courses

8. Data-Driven Modeling – Math 401 (Fall 2025)
9. Discrete Mathematics and Probability – ECE 348 (Spring and Fall 2025)
10. Introduction to Data Visualization – Stat 340L (Fall 2023)
11. Scientific Computing – Math 434 (Fall 2021)
12. Partial Differential Equations – Math 406 (Fall 2013, 2015, 2017 & 2019)
13. Ordinary Differential Equations – Math 345 (Spring 2019 & 2020)
14. Differential Equations – Math 308, Sections 101, 102, 510 & 514 (Fall 2011, Summer 2012)
15. Numerical Analysis – Math 417, Section 500 (Fall 2011)
16. Complex Variables – Math 407 (Fall 2016)
17. Mathematical Modeling – Math 469 (Spring 2011, 2014, 2015, 2022)
18. Linear Algebra I – Math 300, (Fall 2012, Spring 2013, Fall 2014, Spring 2018)
19. Linear Algebra II – Math 420 (Fall 2018, Fall 2020)

Undergraduate Courses

20. Critical Thinking in the Natural & Physical Sciences (Summer 2022)
21. Calculus I – Math 210 (Summer 2013, 2014, 2021, 2022)
22. Calculus II – Math 220 (Summer 2016, 2018, 2020 - 2022, Fall 2020)
23. Calculus III – Math 250 (Fall 2024, Summer 2017, 2019 & 2020)
24. Calculus I for Biological Sciences– Math 216 (Fall 2013, 2015 & 2018, Spring 2016 & 2017)
25. Engineering Calculus I – Math 151, Sections 507 – 509 (Spring 2011)
26. Calculus II for Mathematics and Physics Majors – Math 172, Section 503 (Spring 2012)

27. Calculus II for Biological Sciences – Math 148, Sections 507 – 509 (Spring 2012)
28. Brief Calculus & Matrix Algebra – Math 206 (Fall 2014, 2016, Spring 2017, Summer2018)
29. Business Mathematics I (Honors) – Math 141, Section 200 (Fall 2011)
30. Directed studies for Business Mathematics – Math 285, Section 201 (Fall 2011)

b) Courses Developed or Redesigned

Note abbreviations: New Course (N), Redesigned course (R) and Credit Hours (CH)

1. Numerical Linear Algebra – Math 5532 (R, 3 CH, offered in Fall 2021)
2. Mathematical Methods in Data Science – Math 5545 (R, 3 CH, offered in Spring 2021)
3. Introduction to Data Visualization – Stat 340L (N, 1 CH lab, offered in Fall 2020)
4. Introduction to Diagnostic Analytics –Stat 355L (N, 1 CH lab, offered every spring)
5. Introduction to Predictive Analytics – Stat 360L (N, 1 CH lab, offered every spring)
6. Machine Learning & Statistical Modeling – Stat 400 (N, 3 CH, offered every fall)
7. Data-Driven Modeling – Math 401 (N, 3 CH, offered every other fall semester)
8. Brief Calculus and Matrix Algebra – Math 206 EUReka (R, 3 CH, Experience in Undergraduate Research, offered in Fall 2016)
9. Calculus for Biological Sciences – Math 216 EUReka (R, 3 CH, formerly known as BioMath I, offered in Fall 2015 and Spring 2016)
10. Internship course – Math 496 / Stat 496 Internship and Practical Training in Mathematics or Statistics, N, 1-3 CH, Fall 2015)
11. Mathematical Modeling – Math 469 (N, 3 CH offered every Spring semester)
12. Introduction to Mathematical Biology (Honors) – Math 469H, (R, 3 CH, Texas A & M University, Summer 2012)
13. Epidemiological Modeling of Infectious Diseases – VIBS 689, (N, 3 CH, veterinary students, jointly developed and offered with Dr. Ivanek Spring 2010)

c) Curriculum Development

Note: I was the lead person to develop and offer the following degree programs

1. **Minor in Actuarial Science** (Developed in Fall 2017, offered since Fall 2018): Students will be prepared for the first two actuarial exam (Probability and Financial Mathematics). They will also earn VEE (Validation by Educational Experience) in Micro & Macro Economics and Financial Management. See https://catalog.umkc.edu/colleges-schools/science-engineering/mathematics-statistics/minor-actuarial-science/
2. **Minor in Data Analytics** (Developed in Fall 2019, offered since Fall 2020) Prepares the students for an entry-level Data Analytics job. Students will gain coding skills as well as skills in Data Visualization, Diagnostics and Predictive Analytics. https://catalog.umkc.edu/colleges-schools/science-engineering/mathematics-statistics/minor-

data-analytics/

3. **Minor in Statistics** (Developed in Fall 2019, offered since Fall 2020) Equips students with a general introduction to statistical theory, followed by training in applied statistics with a broad selection of elective statistics classes. https://catalog.umkc.edu/colleges-schools/science-engineering/mathematics-statistics/minor-statistics/
4. **Emphasis in Data Analytics for Bachelor of Applied Science** (Summer 2020 – Spring 2021) Designed for students who have an associate degree in science or liberal arts. It is a degree plan for those who want to be promoted or change their career, e.g. technicians with a vocational or 'non-college transfer' certificate/degrees. The emphasis is designed to increase employability. https://catalog.umkc.edu/colleges-schools/humanities-social-sciences/academic-departments-programs/bachelor-applied-science/
5. **Fast-Track BS/MS Math and Stat Programs** (Developed in Spring 2016, offered since Fall 2016): Students may complete a Bachelor of Science degree in Mathematics and Statistics in four years and the master's degree in Mathematics or Statistics the fifth year. https://catalog.umkc.edu/colleges-schools/science-engineering/mathematics-statistics/dual-bs-math-stats-ms-stats/

d) Current PhD Students

1. Barsha Saha, Ph.D. Mathematics student (Spring 2024 – Present) Research title: "Improving predictability and accuracy of mathematical models to investigate zoonotic spillover influenced by extreme weather events"
2. Priscilla Owusu Sekyere, Ph.D. Mathematics student (Spring 2024 – Present) Research title: "Modeling Spatial Dynamics of Cancer Growth: Reaction–Diffusion Systems and Physics-Informed Neural Networks"
3. Julia Pluta, Ph.D. Statistics student (Spring 2023 - Present) Research title: "Examining Health Equity in COVID-19 Outcomes in Long-Term Care Facilities"
4. Bryan Harris, PhD Student in Natural Sciences Emphasis Mathematics (Spring 2025 – Present) Research title: "Physics-Informed Neural Networks with NCBI Genomic Data & NORS Outbreak Data"

e) Supervised PhD Students

1. Arash Arjmand, Ph.D. Mathematics student (Spring 2023 – Spring 2026) Thesis title: "Integrated Mechanistic and Data-Driven Modeling of Antimicrobial Resistance and Infectious Disease Across One Health and Hospital Systems"
2. Mohammed Alanazi, Ph.D. Mathematics student (Fall 2023 – Spring 2026) Thesis title: "Mathematical Modeling and Sparse Identification of Delay-Driven Dynamical Systems with Applications to Gene Regulatory Networks"
3. Kiel Corkran, Ph.D. Mathematics student (Spring 2023 – Spring 2026) Thesis title: "Uncertainty Quantification in Data-Driven Modeling of Infectious Diseases Across Diverse Healthcare Settings"
4. Malinee Konboon, PhD., Applied Mathematics (Fall 2014- Fall 2016) Thesis title: "A Hybrid Modeling Approach to Assess the Efficacy of Control Measures on Paratuberculosis

on U.S. Dairy Farms." https://mospace.umsystem.edu/items/28cd4b8c-8827-47d1-aeaa-1a59faabbf62

5. Gerry W. Baygents, PhD., Applied Mathematics (Fall 2015- Spring 2018) Thesis title: "Spatio-temporal modeling and analysis of disease spread in wildlife" https://mospace.umsystem.edu/items/cce71863-d3b8-4d0f-a6fb-a92aaf27ae62
6. Hadeel Alqadi, Ph.D., Applied Mathematics (Spring 2019 – Spring 2022) Thesis title: "A Modeling Framework for Spatial Transmission of Covid-19 in Local Communities." https://mospace.umsystem.edu/items/969c8fa6-17cf-4caa-a274-7947345ec436
7. Dilek Soysal, Ph.D., Applied Mathematics (Spring 2019 – Summer 2022) Thesis title: "A Mathematical Modeling Approach to Analyze the Dynamics of Math Anxiety" https://mospace.umsystem.edu/items/95906ce6-c61f-4579-ba2b-bc6e76b7dd89
8. Ravi Chandra Thota, Ph.D., Computer Science student (Spring 2023 – Fall 2025) **Co-supervised with Dr. Yusuf Uddin**, Research Title: "Data-driven Modeling of Infections Using Real-time Location Data and Electronic Health Records"

f) ***Supervised BS/MS Students***

1. Sudhiksha Kumar Mathematics & Statistics Major (Fall 2024 – Summer 2025) Research title: "Integrative Correlation Analysis of NCBI and CDC NORS Data on the Sources, Growth, and Distribution of *Enterobacteriaceae* Species
2. Gianna Cado, Mathematics & Biology Double Major (Fall 2024 – Spring 2025) Honors Research title: "Modeling Transmission Dynamics of Antimicrobial-Resistant E. coli in a Farm-Community Interface"
3. Kathryn Menta, M.S. Mathematics student (Spring 2021 – Spring 2023) Thesis title: "Using stable limit cycles to model p53-mdm2 protein interactions in the presence of DNA damage
4. Siqi Wu, MS Statistics Student (Summer 2020 – Fall 2021) Research title: "Time Series Analysis of COVID-19 Pandemic in Kansas City" https://doi.org/10.3390/ijerph182111496
5. Hazim Gharrawi, MS Engineering Student (Summer 2021 – Spring 2022) Research title: "Applications of Weighted Least Squares in Smart City Planning" https://arxiv.org/abs/2205.00346
6. Joel Busch, Mathematics & Statistics Major (Summer 2021 – Spring 2022) Project title: Vector-borne Modeling of Barley Yellow Dwarf Infection: Coinfection Analysis for Management Strategies, funded by Center for Undergraduate Research in Mathematics

g) ***Supervised Graduate Projects (total of 46 projects)***

1. Bryan Harris, NCBI Genomic Data Downloading and Formatting, 11th Annual UMKC Math and Stat Research Day, April 2025 https://sites.google.com/view/mathrd/home
2. Adriana Martínez Cappello, Comparative Analysis of FTCS and FECD for Numerical Simulation of SIR RD Model, 10th Annual UMKC Math and Stat Research Day, April 2024 https://sites.google.com/view/mathrd/home

3. Long Dang Probabilistic Learning on Manifold for Unsteady Fluid Dynamics Simulations under Uncertainties, 10th Annual UMKC Math and Stat Research Day, April 2024
4. Milad Mohammadi Investigation of a numerical approach replacement for domain discretizing in wall bounded laminar flows, 10th Annual UMKC Math and Stat Research Day, April 2024
5. Most Shewly Aktar Numerical Explorations of the Competitive Reaction-Diffusion Lotka-Volterra Model with Seasonal Growth Rates, 10th Annual UMKC Math and Stat Research Day, April 2024
6. Farzana Sultana Rafi, Comparative analysis of ODE solutions by using Fast and well-conditioned Spectral and Numerical methods, 10th Annual UMKC Math and Stat Research Day, April 2024
7. Makayla Devening Using the Stable Manifold Theorem: Connection between Solutions to Linear and Non-linear Systems, Presented at the 9th Annual UMKC Math and Stat Research Day, April 2023 https://sites.google.com/view/mathrd/home
8. Steven Giangreco Establishing Topological Conjugacy of Local Solutions Using Hartman-Grobman Theorem, Presented at the 9th Annual UMKC Math and Stat Research Day
9. Jodi Donald Implications and Applicability of Hartman-Grobman Theorem for Analyzing Nonlinear Dynamical System, Presented at 9th Annual UMKC Math and Stat Research Day
10. Cole Flackmiller Understanding the Concept of Lyapunov Stability and Applications of Lyapunov Functions, Presented at the 9th Annual UMKC Math and Stat Research Day
11. Dustin Fluderer On the fundamental theorem of existence and uniqueness, Presented at the 9th Annual UMKC Math and Stat Research Day
12. Alex Schaeffer, Feasible Region for Induction of Limit Cycles for a Modified Schnakenberg Trimolecular Two-Species Model, April 2022, Presented at the MAA Missouri Section Meeting, http://sections.maa.org/missouri/
13. Braeden Vaughn, Periodic Tissue Displacements of the Vocal Folds Modelled During Phonation, April 2022, Presented at the MAA Missouri Section Meeting
14. Maggie White, Stability analysis of a gene network model with limited number of genes regulated by negative feedback loops, April 2022, Presented at the MAA Missouri Section Meeting, http://sections.maa.org/missouri/
15. Thomas Parra, Numerical Exploration and Stability Analysis of Extended Versions of Van der Pol Duffing, April 2022, Presented at the MAA Missouri Section Meeting
16. Sean O'Connor, Stability Analysis and Numerical Simulations of an Extended Predator-Prey Model, April 2022, Presented at the MAA Missouri Section Meeting
17. Kathryn Menta, Examinations of Singular and Regular Perturbations on the Fitzhugh-Nagumo Model, April 2022, Presented at the MAA Missouri Section Meeting
18. Jacob Salas, Linear stability analysis of the Gray-Scott chemical reaction model and a proposed generalization, April 2022, Presented at the MAA Missouri Section Meeting
19. Grace Reesman, Automatic Detection of COVID-19 Using Data Extracted from Chest X-ray Images, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021

20. William Ford, Seasonal Changes in Kansas City 311 Service Requests, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
21. Thao Tran, Changes in Kansas City 311 Service Requests Due to COVID-19 Pandemic, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
22. Braeden Vaughn, Analyzing Intercorrelated Factors among Kansas City Neighborhoods During the COVID-19 Pandemic, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
23. Hadeel Alqadi, A Prospective Spaciotemporal Analysis to Detect Clusters of COVID-19 in Kansas City, MO, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
24. Dilek Soysal, Did the COVID-19 Pandemic Increase Math Anxiety in College Students? Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
25. Siqi Wu, Time Series Analysis of COVID-19 Cases in Kansas City, Missouri, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
26. Hadeel Alqadi, Evaluating the Spatial Clusters of COVID-19 with Respect to Demographic Factors in Kansas City, MO, Presented at the Seventh Annual UMKC Math & Stat Research Day, Spring 2021
27. Lucas Delibas, Bryan Harris & Rylan Sampson, Modeling COVID-19 Outbreak: A Cross-Species Approach, Presented at the UMKC Math & Stat Research Day, Spring 2020
28. Matthew Shirley, A Mathematical Model for Examining the Effects of Drug-Resistant Salmonella in Developing Countries, Presented at the Sixth Annual UMKC Math & Stat Research Day, Spring 2020
29. Dilek Soysal, Arash Arjmand & Deepak Sireeshan (Master's Project), A Mathematical Model to Investigate Epidemic Waves of Math Anxiety, Presented at the Sixth Annual UMKC Math & Stat Research Day, Spring 2020
30. Kodi Kuhlmann, A SEIQR Model to Investigate Travel Dynamics from City of COVID-19 Origin to Rest of World, Master's Research Project, Presented at the Sixth Annual UMKC Math & Stat Research Day, Spring 2020
31. Pleasance Mertz, Simulations and Analysis of COVID-19 Spread: Lessens to be learned, Master's Research Project, Presented at the Sixth Annual UMKC Math & Stat Research Day, Spring 2020 featured in UMKC Today (June 8, 2020) see featured UMKC Research News: https://www.umkc.edu/news/posts/2020/june/covid-19-research-by-the-numbers.html
32. Jeffrey Thomas Harris, Layla Ali M Shafei, Modeling and Simulation of Diffraction Through a Circular Aperture, Presented at the Fifth Annual UMKC Math & Stat Research Day, Spring 2019, https://drive.google.com/file/d/1ItsZElP6RX6suX6T-eLK8I9m7lDJaOcL/view
33. Babak Poorebrahim, Applications of principal component analysis in multichannel image processing, Presented at the fifth Annual UMKC Math & Stat Research Day, Spring 2019
34. Sarah Cole, Mohan Gajendran, Ronald Morris, Using Sturm-Liouville Theory to Analyze Steady State Schrodinger Wave Equation, Master's Research Project, Presented at the Fifth Annual UMKC Math & Stat Research Day, Spring 2019
35. Hope Pleasance Mertz, Arman Nokhosteen, Approximate solutions of a projectile equation

using perturbation theory, Fifth Annual UMKC Math & Stat Research Day, Spring 2019

36. E. Hauptmann, R. Kuhlmann Connecting Sturm-Liouville Theory and The Principle of Stationary Action Through Free-Particle Dynamics, Presented at the Fifth Annual UMKC Math & Stat Research Day, Spring 2019
37. Hussain Jabr B Alantari, Mehmet Uylukcu A mathematical model to study the effects of partial remediation of groundwater contaminant source, Presented at the Fifth Annual UMKC Math & Stat Research Day, Spring 2019
38. Spencer T. Smith and Matthew McCoy, Numerical methods for finding eigenvalues of a generalized population matrix, Presented at the Fourth Annual UMKC Math & Stat Research Day, Master's Research Project, Spring 2018
39. Azzah Alshekhi Fitting Oxygen Consumption Versus Live Weight of the Larvae of the Moth Pachysphinx Modesta, Presented at the Fourth Annual UMKC Math & Stat Research Day, Spring 2018
40. Chia-Hui (Amy) Lin, Master's student (Computer Science) Research title: An agent-based modeling approach to understand the contribution of super shedders in spread of paratuberculosis. (Fall 2016-Spring 2017)
41. Jacob Pennington, Master's student (Mathematics) Research title: Semi-Markov process and Markov decision problem, dynamics of infectious diseases (Summer 2016-Summer 2017), Presented at the Third Annual UMKC Math & Stat Research Day, Spring 2017
42. Tahani A. Omer, Master's student (Mathematics/Statistics) Research title: Analysis of bacterial population growth using extended logistic growth model with distributed delay (Spring 2017-Summer 2018), Presented at the Fourth Annual UMKC Math & Stat Research Day, Spring 2018, https://arxiv.org/abs/1807.09108
43. David Jonny, Research title: Seasonal dynamics of hemorrhagic disease in Missouri white-tailed deer population, Spring 2015 (presented at the Math and Stat Research Day)
44. Evan Kraviec, Research title: Dynamics of hemorrhagic disease in Missouri white-tailed deer population, Spring 2015 (presented at the Math and Stat Research Day)
45. Kristin Everson, Using Data analysis and Linear Regression to drive changes in classroom instruction, Spring 2014 (presented in Math Department Graduate Seminar Series)
46. Brandon McCoy, Research title: Irregular Growth Cycles: Goodwin Model Revisited, Spring 2014 (presented at the Community of Scholars Symposium)

h) *Supervised Undergraduate Projects (total of 52 projects)*

1. Sam Golladay, Evaluating the Accuracy of Large Language Models on Mathematics Competition Problems, April 2025 presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2025
2. Gianna Cado, Using A Mathematical Model to Analyze the Spread of Antimicrobial-Resistant *E. coli* Between Farms and Communities, Summer Undergraduate Research Opportunity, SUROP Poster Symposium, August 2024 https://www.umkc.edu/undergraduate-research/docs/24-05-ur-newsletter.pdf
3. Joel Busch, A Mathematical Model to Analyze Vector Transmission and Dynamics of Barley Yellow Dwarf Viral Coinfection, April 2022 presented at UMKC Symposium of

Undergraduate Research & Creative Scholarship, Spring 2022
https://www.umkc.edu/searchsite/

4. Allyson Jenkins, Modeling and Analysis of the Duffing Oscillator with Exponentially Decaying Driving Force, April 2022, Presented at the MAA Missouri Section Meeting
5. Sindhu Balakumar, Math Major, Pre-Med honors student (Summer 2020 – Spring 2021) Honors Thesis title: Statistical Analysis of Kansas City COVID-19 Data with Respect to Race, Ethnicity, Age and Gender https://mospace.umsystem.edu/xmlui/handle/10355/84801

   Collaborative Research: Statistical Analysis of Kansas City COVID-19 Data with Respect to Race, Ethnicity, Age, and Gender, presented at 7th Annual UMKC Math and Stat Research Day, Spring 2021
6. Elizabeth Waldberg Research title: "Statistical analysis of data with R, which aims to identify potential drugs for the treatment of neuroblastoma". Focusing primarily on Principal Component Analysis, Currently Post Graduate Research Associate at Yale University https://www.linkedin.com/in/elizabeth-waldberg-90b756158/
7. Grace Klausen, Mathematics of submarines and whales: A model to quantify the safe range of submarine operation, Spring 2019
8. Jordan Salt, Zachary Wilburn, Jason Greenawalt, Xavien Walker Mathematics of Restoration and Land Recovery, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
9. Greg Troiani, Charles Kremer, Anthony Gosal, Nathan Underwood A Safer Bungee Jump Using A Mathematical Model, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
10. Kathryn Menta & Matthew Shirley, Mathematical Modeling of Thalamocortical Circuit, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
11. Matthew Twaddle, Kenton Hawley, and Jordan O'Brien Microplastic Pollution in the Great Lakes, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
12. Gianna Cado, Ian Hunter, David Tran, Maria Franco Mathematical Analysis of Pharmacokinetics in Sertraline, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
13. Carli Weber, Alex DeGeorge, Matt Combs, Mathematical Modeling and Simulations of Crane Oscillation, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
14. Aaron Sprague, Jacob Fuchs, Michael Black, and Turner Palmer, Damping systems in a multi-story building, presented at UMKC Symposium of Undergraduate Research & Creative Scholarship, Spring 2019
15. Antonia McMonigle Mollie Judge, Mark Kimotho, Pachysphinx modesta Energy-Budget Model, Fall 2018
16. Abdullah Alshuyokh, Research project: Modeling and numerical simulations of ecology and evolution of infectious diseases, Spring 2017

17. Taylor D. Little; Research project: Using a mathematical model to understand the contribution of transient shedders in spread of paratuberculosis, Fall 2016
18. Hunter McDowell, Ricardo Antiguieta, Son Doan, Mehak Sood, Deonte Minor, Tom Upman , Jacob Crowder, and James Risalvato Analysis of 2008-2016 Kansas City water cutoffs in zip codes with median household income between $42k to $55k, Spring 2017, EUReka Project presented at UMKC Symposium of Undergraduate Research & Creative Scholarship. https://www.umkc.edu/searchsite/Ambassadors/Minor.shtml
19. Thai Lor, Jacinda Xiong, Maribel Aguilar, Lauren Hathaway, Justice Coleman Semmelweis, nosocomial infections and disinfectant resistance: disinfection and future problems, Spring 2016, EUReka project
20. Travis Brown, Fathiya Ibrahim, Monica Jemenez, Kristen South, Blake McClary, Philip Best, Alexandra Foster, et. al. Incidence and Prevalence of Water Cutoffs in Kansas City during 2008-2016: Low Income versus High Income Zip codes, Spring 2017, EUReka Project presented at UMKC Symposium of Undergraduate Research & Creative Scholarship.
21. Chondra R. Molden, Tiffany Salerno, Sabina Lyakhova, Thomas Lester, Brandon Byers, Gini coefficient and inequality of income distribution, Fall 2016, EUReka project.
22. Scott Nickell, Ronald Morris and Laura Wymer; Research project: Analysis of Crop Loss in Missouri Due to Spring Freeze Events from 1979 to 2015, (funded by 2016 SUROP grant, accepted for presenting in the 2017 Capitol Hill Research Day, Jefferson City, MO) https://www.umsystem.edu/ums/news/news_releases/040417_news1
23. Olivia Willis, Robert Hirsch, Dean Voelker, The Effects of Atmospheric CO_2 Levels on Earth Surface Temperature, Fall 2015, EUReka project.
24. Laura Wymer, Ameya Chinawalker, Jorgue Martinez, Do the changes in atmospheric CO_2 levels have an effect on global warming? Fall 2015, EUReka project.
25. Kellen Hammonds, Matt Laing, Chris Pham, Lesley Stueber, Dynamics of Chagas Disease in Rural Argentina Affected by Environment: Comparing Coastal and Mountain Regions, Spring 2015, EUReka project.
26. Krista Bricker, Jennyfer Nguyen, Brendon Tran, Sydney Smith, Triatoma infestans bug problem in Argentina: Modeling and analysis, Spring 2016 EUReka project.
27. Melody Lloyd, Classification and Regression Tree Analysis of Smoking Cessation in Population of Smokers Who Are Not Ready to Quit, Fall 2015 (funded by SEARCH grant, presented in 2016 Symposium of Undergraduate Research and Creative Scholarship)
28. Jonathan Davis, Alex Gilgus, Jeremy Szyba Loggerhead Turtle Population, Fall 2014, Linear Algebra Project
29. Hugh Skidmore, Evan Bell, Jeffery Slentz The Adjacency Matrix of a Graph, Fall 2014, Linear Algebra Project
30. Tyler W. Brown, A Mathematical Model of Oral Probiotic and Indigenous Bacterial Ecology Within the Canine Digestive Tract, Fall 2014 – Spring 2015 (presented in the UMKC Math and Stat Research Day) https://www.scirp.org/html/7-2150339_75955.htm
31. Keith Robinson, Kansas City Gang Violence: Mathematical Solutions to a Troubling Problem, funded by UMKC SEARCH, Fall 2014 – Spring 2015 (funded by SEARCH grant,

presented in the 2015 Capitol Hill Research Day, Jefferson City, MO https://www.umkc.edu/searchsite/URDC/URDC_Bios.shtml)

32. Kyle Spencer, Dynamics of Hemorrhagic Disease in Missouri white-tailed deer population, Spring 2015 (presented in 2015 SEARCH symposium, winner of the First Prize in the Physical Sciences & Mathematics category) https://www.umkc.edu/undergraduate-research/
33. James Coop, A Mathematical Model of the Effectiveness of Intervention in Smoking Cessation, Spring 2015 (presented in 2015 SEARCH symposium)
34. Nathan Gearhart, Competitive Lotka–Volterra models to investigate long-term dynamics of grassland rodents in northeastern Kansas, Spring 2014 (presented in 2014 SEARCH symposium) https://www.umkc.edu/undergraduate-research/
35. Jennifer Novogoratz, A Mathematical Model to Determine the Efficacy of Community Intervention and Reform Programs on Kansas City Violent Gang Activity Spring 2014 (presented in 2014 SEARCH symposium)
36. Rachel Crowell, A Mathematical Model of Violent Gang Membership in Kansas City, Spring 2014 (presented in 2014 SEARCH symposium)
37. Michele Brentano, Tyler Brown and Elliott Kieffer, Eigenvalues, Eigenvectors and Their Applications, Fall 2014, Linear Algebra Project
38. Nathan Gearhart, David Hawks, David Ward, Alexander Schuler, James Wilson Clark, An Input -Output Model Output Model of the U.S. Economy, Fall 2012, Linear Algebra Project
39. Nathan Gearhart, David Hawks, David Ward, Alexander Schuler, James Wilson Clark, Dynamics of Pacific Salmon: Limit Cycles and Chaotic Behavior, Fall 2012, Linear Algebra Project
40. Nathan Gearhart, David Hawks, David Ward, Alexander Schuler, James Wilson Clark, A simple matching search engine for scientific journals, Fall 2012, Linear Algebra Project
41. Cooper D. Barry, Dynamics of Single Species Influenced by Density Dependent Birth Functions (presented in Texas A & M Student Research Week, March 2012)
42. Taylor C. Perkins, Pathogen Growth Strategies and Effectiveness of Environmental Decontamination (presented in Texas A & M Student Research Week, March 2012)
43. Joseph Tyler Garvie, Numerical Simulations of Decay of Satellite Orbits (presented in Texas A & M Student Research Week, March 2012)
44. Group project, Nonlinear Dynamics of Suspension Bridge Models, Spring 2012
45. Group Project, Nonlinear Dynamics of a Mass-Spring-Damper System, Spring 2012
46. Analysis of the U.S. Economy from 2004 to 2009: An Input-Output Model, Fall 2011
47. Amy Clanton, Modeling and analysis of Coccidioidomycosis in the endemic regions of Texas: effectiveness of preventive measures (article published by the students: "Preventing spread of valley fever" Texas A & M Undergraduate Research Journal "Explorations", Fall 2011, Vol. 3, 51-53)
48. Ethan Sculthorp, A mathematical model to quantify the effects of probiotics on the abundance of autochthonous intestinal bacteria (presented in the Texas A & M Math Club event, April 2011)

49. Adam Solomon, Finding the optimal area needed at a marathon post-race convention center (presented in MAA 2011 MathFest student talk sessions, August 2011 Lexington, Kentucky)
50. Nathan Hayes, Emerald Ash Borer and Temperature Variations: A mathematical Model (presented in Applied Math Undergraduate Seminar, AMUSE, April 2011)
51. James Richard, Modeling and analysis of Escherichia coli O157:H7 in a dairy herd: influence intermittent shedding and environmental persistence of pathogen (presented in MAA 2011 MathFest student talk sessions, August 2011 Lexington, Kentucky)
52. Luis De Moraes, Dynamics of Avian Influenza in wild birds: Impacts of direct and indirect Transmissions (presented in AMUSE, April 2011)

i) <u>Ph.D. Thesis Committee Member or Co-discipline Advisor (total of 37 theses)</u>

Responsibilities of co-discipline advisor: (1) give co-discipline written exams, (2) read and review dissertation proposals, (3) participate in oral comprehensive exams, (4) give advice related to interdisciplinary methods, (5) evaluate originality, significance and quality of the thesis work

1. Jesi Harris, Physics, (Committee member), 2021– Present
2. Babak Poorebrahim, Computer Science (Co-discipline advisor), 2020– Present
3. Mehmet Uylukcu, Curriculum and Instruction , (Committee member), 2025– Present
4. Jonathan Parman, Mechanical Engineering, (Co-discipline advisor), 2020 – Present
5. Jesi Harris, Physics, (Committee member), 2021– Present
6. Jamila Kridan, Statistics, (Committee member), 2020 – 2025

   Thesis Title: *"A Partially-Observed Merton's Model for Financial Ultra-High Frequency (UHF) Data with Bayesian Learning via Filtering Equations"*
7. Vishal Choudhury, Economics, (Co-discipline advisor), 2021– 2025 Thesis Title: *"Three Essays in Political Economy"*
8. Khaja Moinuddin Chinnakondepalli, Statistics, (Committee member), 2019 – 2025 Thesis Title: *"Comparison of longitudinal analysis models for the health-related quality of life in interventional cardiology: a simulation study"*
9. Megan (Quick) Romstad, Biomedical Informatics, (Committee member), 2021– 2024

   Thesis Title: *"Examination of postoperative outcomes following elective colorectal surgery"*
10. Dewan Noor, Electrical Engineering (Committee member), 2020– 2021

    Thesis Title: *"Vision task driven image super-resolution and image enhancement"*
11. Ivan Velasquez, Economics, (Co-discipline advisor), 2019– 2022

    Thesis Title: "*The Role of Monetary Policy in the Functional Income Distribution and Economic Growth in a Money Manager Capitalist System: The Case of United States 1970-2015*"
12. Mofareh Ghazwani, Physics, (Co-discipline advisor), 2019– 2022,

    Thesis Title: "*A study of carbon and iron charged point defects in gallium nitride: electronic structure implications for high-power photoconductive solid state switch*

applications"

13. Layla Ali Shafei, Physics, (Committee member), 2019– 2024

    Thesis Title "*DFT study of electronic structure and mechanical properties of clay minerals, and using large-scale supercell modeling for solvated montmorillonite*"

14. Kelly Lee, Curriculum and Instruction, (Committee member), 2019– 2023

    Thesis Title: *"The Effects of teachers' Mathematical Practices on Student Achievement in the Diverse Classroom"*

15. Kathariya Birendra, Electrical Engineering, (Co-discipline advisor), 2019– 2024

    Thesis Title: *"Multi-Scale Deep-Learning Approaches For Visual Coding and Processing"*

16. Shimin Tang, (Committee member), 2018 – 2021

    Thesis Title: *"Disaster and Infrastructure Scene Understanding,"*

17. Ronald Ayoub, Computer Science, (Co-discipline advisor), 2018– 2021

    Thesis title: "*Rupee: A big data approach to indexing and searching protein structures".*

18. A N M Wasekul Azad, Electrical Engineering, (Co-discipline advisor), 2017 – 2021

    Thesis Title: "*Development of pulsed power sources using self-sustaining nonlinear transmission lines and high-voltage solid-state switches*

19. Benjamin Floyd, Physics, (Co-discipline advisor), 2018 – 2024, Thesis Title: "Infrared-Bright Active Galactic Nuclei in Massive Galaxy Clusters"

20. Rohit Saini, Mechanical Engineering, (Co-discipline advisor), 2018 – 2022

21. Mohan K. Gajendran, Mechanical Engineering, (Co-discipline advisor), 2017 – 2023
    Thesis Title: "*Machine Learning Based Predictive Modeling of Stochastic Systems*"

22. Abu Hanif, Electrical Engineering, (Co-discipline advisor), 2017 – 2021, Thesis Title: *"Measuring level of degradation in power semiconductor devices using emerging techniques"*

23. Ali Koleiny, Earth and environmental sciences, (Co-discipline advisor), 2017 – 2020

24. Ekpoh Yawo, Statistics, (Committee member), 2018– 2020

    Thesis title: *"Applications of multivariate analysis to understand the dynamics of African conflicts"*

25. Timothy Paul Chappell, Curriculum and Instruction, (Committee member), 2019 – 2020

    Thesis title: *"A Longitudinal study of modeling-based college algebra and its effect on student achievement"*

26. Bader Alanazi, Statistics, (Committee member), 2018– 2020

    Thesis title: *"Sequential Sampling Designs for Estimating Software Reliability"*

27. Matthias Ziefuss, Mechanical Engineering, (Co-discipline advisor), 2018 – 2020

    Thesis title: *"Identification and Development of a Reliable Framework to Predict Passive Scalar Transport for Turbulent Bounded Shear Flows"*

28. Mostafa Badroddin, Mechanical Engineering, (Co-discipline advisor), 2017 – 2020

    Thesis title: *"Multi-hazard resilience assessment of river-crossing bridges"*

29. Xing Xia, Statistics, (Committee member), 2018 – 2019

Thesis title: *"Efficient sequential designs with asymptotic second-order lower bound of Bayes risk for estimating product of means"*

30. Abbas Karrar, Mathematics, (Committee member), 2017 – 2020

    Thesis title: *"Anisotropic Mesh Adaptation for Image Segmentation based on Partial Differential Equations"*

31. Nasir Zarzour, (Committee member), 2015 – 2019

    Thesis title: *"Sequential test allocation for estimating software reliability with associated cost"*

32. Brandon McCoy, Economics, (Co-discipline advisor), 2015 – 2020

    Thesis title*: "Labor Market Outcomes and Employment Policy"*

33. Munsur Rahman, Mechanical Engineering, (Committee member), 2015 – 2017

    Thesis title: *"Musculoskeletal Modeling of The Human Elbow Joint"*

34. Michael Richman, Physics, (Co-discipline advisor), 2016 – 2018

    Thesis title: *"Ferroelectric System Dynamics and the Properties of Ferroelectric / Two-Dimensional Electron Gas Heterostructures: a Ginzburg–Landau Study"*

35. Xing Song, Statistics, (Committee member), 2015 – 2016

    Thesis title*: "Efficient sequential designs with asymptotic second-order lower bound of Bayes risk for estimating product of means"*

36. Wei Wu, Statistics, (Committee member), 2013 – 2014

    Thesis title: *"Sequential Designs with Application in Software Engineering"*

37. Jianfeng Meng, Statistics, (Committee member), 2013 – 2014

    Thesis title: *"Bayesian Change Point Analysis of Copy Number Variants Using Human Next Generation Sequencing Data"*

j) M.S. Thesis Committee Member

1. Ahmed Azeez, (Applied Mathematics) 2016– 2017

   Thesis title*: "Mesh Adaptation in Fractured Reservoir Simulation"*

2. Peter Uhl (Applied Mathematics) 2016– 2017

   Thesis title: *"Modeling the Effects of Drugs of Abuse on HIV Infections with Two Viral Species"*

Academic and Professional Service

a) Service to the Department/Division/School

1. School of Science and Engineering (SSE) Boot camp, Calculus Series (August 2024)
2. SSE Science and Math Open House, Mathematics of Fractals (October 2024)
3. Annual Mathematics and Statistics Programs Assessments (Fall 2019 – Present)
4. Chair/Member of hiring committees (2022, 2023)
5. Associate Director (Fall 2022 – Sumer 2024)

6. Department Chair (Fall 2019 – Summer 2022)
    a. Organized multiple "Math & Stat Careers" information sessions and Career fairs (Fall 2019 – Spring 2021)
    b. Promoted online teaching and organized faculty training sessions for online teaching (Fall 2019 – Fall 2020)
    c. Appointed committees to develop, assess and implement long-range department plans (Spring 2018 – Fall 2022)
    d. Formed and led committees to propose and offer new degree programs in statics, actuarial science and data science (Spring 2019– Fall 2021)
    e. Developed Math & Stat Career Paths and degree programs in Actuarial Science and Data Analytics (Spring 2018– Spring 2021)
    f. Provided leadership to become a student-centered department with excellence in research and teaching (Fall 2019 – Summer 2022)
    g. Increased Department's retention and recruitment; stabilized the number of math majors and graduate students; increased the number of math minors & BS/MS students (Spring 2018 – Fall 2022)
    h. Stimulated the use of academic support (SI sessions, tutoring and mentoring) for students enrolled in entry-level math courses (Fall 2019 – Present) https://www.umkc.edu/asm/mast/
7. Undergraduate Advisor (Fall 2013– Spring 2020)
8. Member and co-founder of UMKC Applied Mathematics Group (Spring 2015– Present) https://www.youtube.com/@umkcappliedmathematicsgrou7487
9. Coordinator, MS/BS mathematics and statistics fast-track programs (Spring 2016– Fall 2018)
10. Editor and Writer of UMKC RooMath Newsletter (Summer 2013– Present) https://sites.google.com/view/mathroos/home
11. Math Department Webmaster (Spring 2013– 2020): Updated and added contents to several webpages including News & Events, Advising, Graduate Programs, Applied Math Group Activities, and Student Resources
12. Organizer of Math & Stat Colloquium Series (Fall 2012 and Spring 2013)
13. Faculty coach, UMKC Mathematics Competition Team, Missouri Collegiate Mathematics Competition (Spring 2014 – Spring 2017, Spring 2022) UMKC Team A (Chandler Tarrant, Allyson Jenkins, and Michael Bai) took 5th place in Spring 2022
14. Supervisor, Math Success Lab – Tutorial help for upper-level math courses offered by the math and stat department (Fall 2014 – Spring 2016)
15. Member of Math Curriculum Committee (Fall 2012– Present)
16. Member of Undergraduate Program Committee (Fall 2012– Present)
17. Member of Graduate and Doctoral Committees (Fall 2012– Present)
18. Course Contact for Math 300, 406, 469, and 5545 (Fall 2013– Present)

b) ***Service to the University***

19. Reviewer of SEARCH and SUROP student grant proposals (2015 – Present)
20. Faculty advisor, Multidisciplinary Analysis Research and Clinical Hub – MARCH (Fall 2023 – Present)
21. Faculty advisor and founder of UMKC Math Club (Fall 2014 – Fall 2024)
22. Faculty co-advisor and co-founder of UMKC Math and Stat Graduate Student Organization, MSGSO (Fall 2014– Fall 2024)
23. Faculty advisor, Chess Club, (Fall 2015– Present) https://roogroups.campuslabs.com/engage/organization/UCC
24. Member of UMKC SSE Promotion and Tenure Committee (Fall 2022 – Fall 2023)
25. Member of the UMKC Forward Committee (Summer 2020 – Fall 2021)
26. Member of the College of Arts & Sciences Steering Committee (2016 – 2017)
27. Member of Undergraduate Research Advisory Board (2015– 2024) https://www.umkc.edu/searchsite/
28. Member of General Education Executive Committee, Math Pathway subcommittee and "UMKC Essentials" implementation team (Fall 2019 – Fall 2023) https://www.umkc.edu/provost/strategic-initiatives/general-education.html
29. Member of the College of Arts and Sciences retention and recruitment committee (2019)
30. Faculty Judge, SEARCH Symposium (Spring 2015, 2016, and 2019) https://www.umkc.edu/searchsite/symposium/index.shtml
31. Co-chair of the new General Education Program (Gen Ed 2.0) development for Critical Thinking in Natural and Physical Sciences (2018–2019)
32. Modeling Consultant, Department of Criminal Justice and Criminology (2015 – 2016)
33. Faculty Judge, Three-Minute Thesis Competition (Spring 2017)
34. Faculty Judge, UMKC Annual conference of Interdisciplinary Social Science (2013)
35. Member of the College of Arts and Sciences Internship Task Force (2015 – 2016)

c) ***Service to the Professional Society***

1. Co-organizer of mini-symposia in SIAM Central States Section meetings (2015 – Present) https://www.siam.org/membership/sections/detail/siam-central-states-section
    a. Current Trends in Ecology and Disease Modeling, co-organized by Dr. Naveen Vaidya (April 11–12, 2015) https://siamcentral.mst.edu/
    b. Modeling and Computations for General and Chaotic Biological Systems, Organizers: Majid Bani-Yaghoub, Naveen K. Vaidya, Xianping Li, and Noah Rhee (September 30 - October 2, 2016) https://siamcentral2016.mst.edu/
    c. Ecology and Evolution of Infectious Diseases, co-organized by Dr. Xueying Wang (Sep. 30th - Oct. 1st, 2017) https://siamcentral2017.colostate.edu/
    d. Infectious Disease Modeling and COVID-19 Pandemic: Prediction, Vaccination, Control, and Ongoing Challenges, (October 2-3, 2021) co-organized by Dr. Folashade B. Agusto https://siamcss2021.ku.edu/

e. Advances in Computational Modeling of Infectious Diseases (October 7-8, 2023) co-organized by Dr. Yusuf Uddin https://math.unl.edu/siam-2023

f. Advances in Mathematical and Computational Models in Biology, Health and Medicine, (October 5-6, 2024) co-organized by Arash Arjmand https://sse.umkc.edu/siam-2024/

2. Chair of the Organizing Committee: 9th Annual Meeting of SIAM Central States Section, October 5-6, 2024, Kansas City, Missouri, hosted by UMKC Division of Computing, Analytics, and Mathematics. https://sse.umkc.edu/siam-2024/
3. Guest Editor, (June 2024 – July 2025) "Advances in modeling climate change, antimicrobial resistance, human behavior, and their interactions" Mathematical Biosciences and Engineering https://www.aimspress.com/mbe/article/6846/special-articles
4. Guest Editor, (January 2024 – 2025) Mathematics MDPI, Impact Factor 2.4, Established in 2013, Special Issue on "Applications of Difference and Differential Equations in Mathematical Epidemiology" https://www.mdpi.com/journal/mathematics
5. Guest Editor, (2019 – 2022) Mathematical Biosciences and Engineering, Impact Factor 2.6, Established in 2004, Special Issue on "Advances in Ecological Modelling" http://www.aimspress.com/newsinfo/1347.html
6. Guest Editor, (2021 – 2022) Complexity, Impact Factor 2.3, Established in 1995, Special Issue "Applications of Delay Differential Equations in Biological Systems" https://www.hindawi.com/journals/complexity/si/764173/
7. Reviewer of journal papers (2-3 manuscripts per year from journals such as Mathematical Biosciences, Journal of Differential Equations, Journal of Dynamical and Control Systems, and Mathematical Methods in the Applied Sciences)
8. Reviewer of grant proposals for different agencies such as NSF, NSERC, UMRB, and DOD (2012 – present)
9. Reviewer, 37th International Conference of the Florida Artificial Intelligence Research Society, 2024, Sandestin Beach, https://www.flairs.com/conferences/past-conferences
10. Member of Steering Committee, Models of Infectious Disease Agent Study (MIDAS) Network funded by NIH (January 2023 – January 2025) https://midasnetwork.us/
11. Session Chair (2022) Missouri Section Meeting of the Mathematical Association of America, Friday, April 8, and Saturday, April 9, 2022 | Kansas City, Missouri, hosted by UMKC Division of Computing, Analytics, and Mathematics. http://sections.maa.org/missouri/
12. External PhD thesis examiner (Spring 2020), University of Western Cape, Math Department https://www.uwc.ac.za/Faculties/NS/Mathematics/Pages/default.aspx
13. Hosted collaborative research with Dr Justin B. Munyakazi (Spring 2019) "Development of nonstandard finite difference methods for integro-differential equations arising in population dynamics" UM/UWC Faculty Exchange Program https://www.umsystem.edu/media/president/southafrica/2019-justin-Munyakazi.pdf

14. Organizer of UMKC Annual Mathematics & Statistics Research Day (2015 – 2021) https://sites.google.com/view/mathrd/home
15. Co-organizer of Research-A-Thon Day – Mathematics & Statistics Track, UMKC Division of Computing, Analytics and Mathematics (2023 – Present)
16. Co-organizer of the Midwest Math and Stats Student Conference (2021), Northwest-Kansas City https://www.nwmissouri.edu/kc/events/MidwestMath/index.htm
17. Faculty Judge, Texas Junior Academy of Science (2012)

d) Community Engagement

1. Co-organizer of Integration Bee: A contest for undergraduates and high school students with prizes for the best skills in evaluating integrals (2016– 2020, 2023, and 2024) https://sse.umkc.edu/current-students/student-life/student-teams.html
2. Co-organizer of annual celebration of Pi Day at UMKC, open to the public (2014–2019) KC Star 2015 Article: Best Pi Day of the century: A certain circular dessert is just one way to celebrate https://www.kansascity.com/living/article13125005.html
3. Collaborator (2017) Correlation analysis of water rates and water cutoffs in Kansas City, See the documentary: KCPT's Public Works - Water Rates & Rivers KCPT's Public Works - Water Rates & Rivers https://youtu.be/S88tS9yeVjo?t=326
4. Collaborator (2018) Exploring the connection between music, sound, mathematics, and art, Folk Alliance International, Artist in Residence, Henry Nam, KC Art Institute https://youtu.be/EemA-id4bNg?t=581 see also https://www.youtube.com/watch?v=-B01RjG9tgg&feature=youtu.be

e) In the News/Media

1. COVID-19 Research by the Numbers – studying the potential spread in January (2020) https://www.umkc.edu/news/posts/2020/june/covid-19-research-by-the-numbers.html
2. Virtual Laboratory of Pathogen Transmission for Healthcare worker (2022) https://umkc.edu/news/posts/2022/october/umkc-infectious-disease-collaboration-awarded-879k.html
3. One Health Modeling Research at UMKC Seeks New Tools To Combat Antimicrobial-Resistant Organisms https://bionexuskc.org/one-health-modeling-research-at-umkc-seeks-new-tools/
4. Folk Alliance International: https://youtu.be/EemA-id4bNg?t=581
5. KCPT's Public Works - Water Rates & Rivers https://youtu.be/S88tS9yeVjo?t=326
6. Infusing Confidence in Undergraduate Researchers: https://web.archive.org/web/20241010013918/https://info.umkc.edu/news/infusing-confidence-in-undergraduate-researchers/