

Kaiming (Daniel) Bi

Phone: 785-770-5830 Email: Kaiming.Bi@utc.tmc.edu Updated on December 2024

Google Scholar : <https://scholar.google.com.au/citations?user=56ebSPAAAAAJ&hl=en>

Address: E301, 1200 Pressler Street, Houston, Texas 77030

EDUCATION

- ❖ **Kansas State University**, Manhattan, KS 2015-2020
Ph.D., Industrial Engineering.
Dissertation Title “Analytics and Theoretical Studies of Complex Systems and their Applications in Epidemic Models”
- ❖ **Northeastern University (NEU)**, Shenyang, China 2011-2015
Bachelor of Science, Mathematics.

RESEARCH & WORK APPOINTMENTS

- ❖ **Assistant Professor (tenure-track)** Dec 2024~ present
Department of [Management, Policy, and Community Health](#), [School of Public Health](#), UTHealth Houston
Affiliated with the [Center for Health Care Data](#)
- ❖ **Research Associate & Postdoc Research fellow** Aug 2021~ Nov 2024
Department of [Integrative Biology](#), UT Austin
- ❖ **Postdoc Research fellow** Aug 2020~ Aug 2021
[Division of Infectious Disease and Public Health at School of Medicine](#), UCSD
- ❖ **Graduate Research Assistant & Department IT administrator** Aug 2015~ May 2020
Department of [Industrial and Manufacturing Systems Engineering](#), KSU
- ❖ **Data Analyst Summer Intern** May 2019~Aug 2019
FedEx Service at FedEx World Headquarter, Memphis

RESEARCH GRANT

- ❖ CSTE NU38OT000297, Development of Forecasts and Mathematical Models for COVID-19 and RSV to Inform Public Health Decision making, Co-PI 2023
Date: Aug 2023 – July 2024, Amount: \$ 325,000 (My share: \$89,810), Funded
- ❖ CSTE NU38OT000297, Development of Forecasts and/or Scenario Projections for Influenza to Inform Public Health Decision Making, Co-PI 2023
Date: Sep 2023 – July 2024, Amount: \$ 250,000 (My share: \$40,000), Funded
- ❖ NSF MPOPHC: Dynamic Human Behavior in Immune-Epidemiological Models to Identify the Factors Driving COVID-19 and Influenza Age, Ethnic, and Geographic Disparities In El Paso County, TX, Co-PI 2024
Date: Jan 2025 – Dec 2027, Amount: \$ 1,800,000 (My share: \$500,000), Submitted
- ❖ NSF Rapid Response Research (RAPID), Scenario Projections for Seasonal Influenza, SARS-CoV-2 and RSV Burden in the US (2023-2024), Senior Personnel 2023
Date: Oct 2023 – Sep 2024, Amount: \$195,101, Funded
- ❖ NSF 22-054, Incorporating Human Behavior in Epidemiological Models (IHBEM), collaborator 2022
Date: Jan 2023 – Dec 2025, Amount: \$ 997,739 (multi-agency), Funded
- ❖ CDC-RFA-FT-23-0069, Partner with CFA to Improve Outbreak Response Using Disease Modeling and Analytics, collaborator 2023
Date: Sep 2023 – Aug 2028, Amount: 27,500,000 (multi-agency), Funded

PEER-REVIEWED JOURNAL PUBLICATIONS

Published:

1. Sung-mok Jung,... **Kaiming Bi**, Lauren Meyers,..., Justin Lessler. "Potential impact of annual vaccination with reformulated COVID-19 vaccines: lessons from the US COVID-19 Scenario Modeling Hub". *Plos Medicine* 21, no. 4 (2024): e1004387. IF: 15.8.
2. Anass Bouchnita†, **Kaiming Bi**†, Spencer Fox, Lauren Ancel Meyers. "Projecting Omicron scenarios in the US while tracking". *Epidemics* (2024): 100746. IF: 5.324.
3. Emily Howerton,..., **Kaiming Bi**, Lauren Meyers,..., Cécile Viboud, Justin Lessler. "Informing pandemic response in the face of uncertainty". *Nature communications* 14, no. 1 (2023): 7260. IF: 17.694.
4. Bandekar, Shraddha Ramdas, Mini Ghosh, and **Kaiming Bi**. "Impact of high-risk and low-risk population on COVID-19 dynamics considering antimicrobial resistance and control strategies." *The European Physical Journal Plus* 138, no. 8 (2023): 697. IF: 3.758
5. **Kaiming Bi**, Jose Luis Herrera-Diestra, Yuan Bai, Zhanwei Du, Lin Wang, Graham Gibson, Maureen Johnson-Leon, Spencer J. Fox, and Lauren Ancel Meyers. "The risk of SARS-CoV-2 Omicron variant emergence in low and middle-income countries (LMICs)." *Epidemics* (2023): 100660. IF: 5.324.
6. **Kaiming Bi**, Yuyang Chen, Chih-Hang (John) Wu, Davide Ben-Arieh. "A New Learning-Based Impulse Control with Event Triggered Conditions for the Epidemic Dynamic System". *Communications in Nonlinear Science and Numerical Simulation* (2022): 106204. IF: 4.260.
7. **Kaiming Bi**, Dong Lin, Yiliang Liao, Chih-Hang (John) Wu, Pedram Rarandoush. "Additive manufacturing embraces big data." *Progress in Additive Manufacturing* (2021), DOI:10.1007/s40964-021-00172-8. IF: 4.97.
8. **Kaiming Bi**, Yuyang Chen, Songnian Zhao, David Ben-Arieh, and Chih-Hang John Wu. "A new zoonotic visceral leishmaniasis dynamic transmission model with age-structure." *Chaos, Solitons & Fractals* 133 (2020): 109622. IF: 9.922.
9. **Kaiming Bi**, Yuyang Chen, Chih-Hang John Wu, and David Ben-Arieh. "A Memetic Algorithm for Solving Optimal Control Problems of Zika Virus Epidemic with Equilibriums and Backward Bifurcation Analysis." *Communications in Nonlinear Science and Numerical Simulation* (2020): 105176. IF: 4.260.
10. Yuyang Chen, **Kaiming Bi**, Chih-Hang (John) Wu, David Ben-Arieh, "A New Evidence-Based Optimal Control in Healthcare Delivery: A Better Clinical Treatment Management for Septic Patients" *Computer & Industrial Engineering*, November, 2019, DOI: /10.1016/j.cie.2019.106010. IF: 7.18.
11. **Kaiming Bi**, Yuyang Chen, Songnian Zhao, Yan Kuang, Chih-Hang (John) Wu. "Current Visceral Leishmaniasis Research: A Research Review to Inspire Future Study", *BioMed Research International*, July 2018, DOI: 10.1155/2018/9872095. IF: 3.411.
12. Songnian Zhao, Chih-Hang Wu, Yan Kuang, **Kaiming Bi**, Davide Ben-Arieh. "Risk Perception and Human Behaviors in Epidemics," *IIE Transactions on Healthcare Systems Engineering*, March, 2018, DOI: 10.1080/24725579.2018.1464085. IF: 1.41.
13. **Kaiming Bi**, Yuyang Chen, Songnian Zhao, David Ben-Arieh, Chih-Hang (John) Wu. "Modeling Learning and Forgetting Processes with the corresponding impacts on Human Behaviors in Infectious Disease Epidemics," *Computer & Industrial Engineering*, March, 2018, DOI: /10.1016/j.cie.2018.04.035. IF: 7.18.
14. Chen, Yuyang, **Kaiming Bi**, Songnian Zhao, David Ben-Arieh, and Chih-Hang John Wu. "Modeling individual fear factor with optimal control in a disease-dynamic system." *Chaos, Solitons & Fractals* 104 (2017): 531-545. IF: 9.922.
15. Songnian Zhao, Yan Kuang, Chih-Hang Wu, David Ben-Arieh, Marcelo Ramalho-Ortigao, and **Kaiming Bi**. "Zoonotic visceral leishmaniasis transmission: modeling, backward bifurcation, and optimal control." *Journal of mathematical biology* 73, no. 6-7 (2016): 1525-1560. IF: 2.319.
16. **Kaiming Bi**, "Aim at College-coaching Legends", *Science and Technology Innovation Herald (In Chinese)*, ISSN 1674-098X CN 11-5640/N, 2014, (26).
17. **Kaiming Bi**, "Mathematics Modeling of Reconstructing Shredded Documents", *Value Engineering (In Chinese)*, ISSN 1006-4311 CN 13-1085/N, 2014, (25).

Published Technical Report:

18. **Kaiming Bi**, Anass Bouchnita, Oluwaseun F Egbelowo, Spencer Fox, Michael Lachmann, Lauren Ancel Meyers. "Scenario projections for the spread of SARS-CoV-2 Omicron BA. 4 and BA. 5 subvariants in the US and Texas". *The University of Texas at Austin COVID-*

19 Modeling Consortium (2022).

Submitted:

19. Annick Borquez, Ietza Bojorquez, Javier Cepeda, **Kaiming Bi**, Alicia Vera, Natasha Martin, Steffanie Strathdee. “Mixed-methods qualitative and modeling study estimating the feasibility and impact of providing HIV treatment and opiate agonist therapy in prison on HIV incidence among people who inject drugs in Tijuana, Mexico”. *Drug and Alcohol Dependence*. IF: 3.951.
20. **Kaiming Bi**, Jack Stone, Tommi Gaines, Aaron Lim, Charles Marks Annick Borquez. “The Contribution of drug sharing to the prescription opioids’ epidemic: a dynamic modeling study with heterogeneous analysis”. *PNAS* (Under first-round Review). IF: 11.61.
21. **Kaiming Bi**†, Shraddha Ramdas Bandekar†, Anass Bouchnita, Spencer Fox, Lauren Ancel Meyers. “Retrospective evaluation of annual burden scenario projections for SARS-CoV-2, Influenza, and RSV in the US (2023-2024)”. *Emerging Infectious Diseases* (Under first-round Review). IF: 11.4.
22. Sara Loo,... Kaiming Bi, Lauren Meyers,...Shaun Truelove. “Scenario projections of COVID-19 hospitalizations and deaths, considering immune escape levels and annual vaccination recommendations—United States, April 2024–April 2025” *MMWR Series*.

Working Papers:

23. **Kaiming Bi**, Jose Luis Herrera-Diestra, Spencer Fox, Alessandro Vespignani, Joel Miller, Lauren Meyers. “How far is the herd immunity?”: A modeling-based study of vaccination-induced immunity and disease-induced immunity through the network. (In draft finalizing)
24. **Kaiming Bi**†, Anass Bouchnita†, Shraddha Ramdas Bandekar†, Spencer Fox, Lauren Ancel Meyers. “Modeling-based Retrospective analysis for the 2022-2023 Season Flu Vaccine Strategy”. (In draft preparing)
25. Yuyang Chen, **Kaiming Bi**, Chih-Hang (John) Wu, Davide Ben-Arieh. “A Computational Scheme for Stochastic Optimal Control Systems with Variance Constraint”. (In draft preparing)
26. Yuyang Chen, **Kaiming Bi**, Chih-Hang (John) Wu, Davide Ben-Arieh. “A New Bayesian Optimization Algorithm for Complex High-Dimensional Disease Epidemic Systems and Related Computational Studies”. (In draft preparing)
27. Emily Javan, Jose Luis Herrera-Diestra, ...**Kaiming Bi**, Spencer Fox. “Autochthonous malaria transmission in the United States is not surprising -- a modeling-based study”. (In draft preparing)

CONFERENCE PUBLICATIONS AND POSTERS

1. Bren Case, ...Kaiming Bi, ...Spencer Fox. “Charting the Course for Respiratory Virus Activity in the Southern Hemisphere: Real-Time Forecasting of Severe Acute Respiratory Infections in Paraguay, 2024”, *OPTIONS XII 2024*.
2. Shraddha Bandekar, Kaiming Bi, Anass Bouchnita, Spencer J. Fox, Lauren Ancel Meyers. “Estimated Impact of 2022-2023 Influenza Vaccines on Seasonal Disease Burden in the US”. *MIDAS conference 2024*.
3. Spencer J. Fox, Anass Bouchnita, Graham C. Gibson, **Kaiming Bi**, Spencer Woody, Linda Pei, Susan Ptak, Kelly Gaither, Michael Lachman, Lauren Ancel Meyers. “Lessons from recent COVID-19 and Influenza modeling efforts”. *CSTE Annual Meeting, 2022*.
4. Anass Bouchnita, **Kaiming Bi**, Spencer Fox, Zhanwei Du, Lauren Meyers. “Individual- and population-level immunity modulates key epidemiological characteristics of COVID-19.” In the 5th Workshop on Virus Dynamics, 2021.
5. **Kaiming Bi**, Tommi Gaines, Peter Davidson, Steffanie Strathdee and Annick Borquez. "The Contribution of Drug Sharing to the Prescription Opioids’ Epidemic: A Dynamic Modeling Study." In the 83rd CPDD Annual Scientific Meeting. Poster. The College on Problems of Drug Dependence (CPDD), 2021.
6. **Kaiming Bi**, Yuyang Chen, Chih-Hang Wu and David Ben-Arieh. "Prevention strategy of Zika Virus Epidemic Using Memetic Algorithm and optimal control." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2019.
7. Chen, Yuyang, **Kaiming Bi**, Chih-Hang Wu and David Ben-Arieh. "A Computational Scheme to Stochastic Optimal Control with Variance Constraint." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2019.
8. **Kaiming Bi**, Yuyang Chen, Chih-Hang Wu and David Ben-Arieh. "An agent-based model of individual forgetting and learning behavior in Epidemics." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2018.
9. Chen, Yuyang, **Kaiming Bi**, Chih-Hang Wu and David Ben-Arieh. "A New Zoonotic Visceral Leishmaniosis Dynamic Transmission

Kaiming (Daniel) Bi

- Model with Age-Structure." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2018.
10. **Kaiming Bi**, Yuyang Chen, Chih-Hang Wu, David Ben-Arieh, Songnian Zhao, and Yan Kuang. "A New Evidence Based Optimal Control (EBOC) Method for Better Sepsis Clinical Treatment." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2017.
 11. Chen, Yuyang, **Kaiming Bi**, Chih-Hang Wu, David Ben-Arieh, Songnian Zhao, and Yan Kuang. "An Individual Fear Factor model for Information Transmission and Human behavior with Stability Analysis." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2017.

CONFERENCE PRESENTATIONS AND INVITED TALKS

1. "Empowering Epidemic Decision making: A data-driven Approach through scenario modeling" University of Houston, Department of Industrial Engineering, Graduate Seminar, 2024
2. "Data-Driven Epidemic Projection Using Scenario Modeling" INFORMS Annual Conference, 2023.
3. "OR METHODS SUPPORTING INFECTIOUS DISEASE MODELING FIGHT WITH EPIDEMIC" Kansas State University, Department of Industrial and Manufacturing Systems Engineering, Graduate Seminar, 2023
4. "Scenario Projections for the 2023-24 Flu, SARS-Cov2, and RSV" CDC COVID-19/Influenza Modeling Network meeting, 2023
5. "The path to herd immunity: How past infection and vaccination differentially protect a population" INFORMS Annual Conference, 2022.
6. "Omicron BA 4&5 variants scenario projections in United States and Texas." Simulation Modeling Hub Meeting, 2022
7. "How past infection and vaccination differentially protect a population." Ecology & Evolution of Infectious Diseases, 2022
8. "A Novelty Evidence based Convolutional Event Trigger Control System." INFORMS Annual Conference, 2019.
9. "Dynamic Modeling, Analysis and Optimal Control in Epidemic Modeling." IMSE Graduate Seminar
10. "Quantum-based Memetic Algorithm and the applications in Optimization", IISE Annual Conference, 2019
11. "Memetic Algorithm for Optimal Control of Zika Virus Epidemic with Bifurcation Analysis." INFORMS Annual Conference, 2018.
12. "Agent-based model of human behavior in Epidemics." IISE Annual Conference, 2018.
13. "New Evidence Based Optimal Control for Better Sepsis Clinical Treatment." IIE Annual Conference, 2017.

AWARDS AND HONORS

❖ Pencis Best Researcher Award: International Research Awards on Infectious Diseases	2021
❖ Outstanding GTA service to the IMSE department	2020
❖ Outstanding dissertation award at Carl R. Ice College of Engineering	2020
❖ IISE Annual Conference Best Paper (1 st place) in Modeling & Simulation	2018
❖ Golden Key Outstanding Graduate Research Assistant nominee	2018
❖ Robert I-Jen and Sophia Shui-Kan Jung Graduate Scholarship	2015
❖ Second Prize of China Mathematical Contest in Modeling	2013
❖ First Prize of Liaoning Province Mathematical Contest in Modeling	2013

TEACHING EXPERIENCE

- ❖ **Instructor in lab session**, IMSE, KSU Aug 2018~May 2019
IMSE 643, Industrial Simulation (Fall 2018 and Spring 2019)
Teach and demonstrate 2 sessions (10 lectures each semester), Grade homework and holding help sessions for 50 students in IMSE 643
Contents: SIMIO software, modeling of manufacturing, production, service and stochastic systems
- ❖ **Graduate Teaching Assistant**, IMSE, KSU Aug 2015~May 2016
IMSE 881, Linear Programming (Fall 2015) and IMSE 685, Manufacturing Information Systems (Spring 2016)
Grade homework and holding help sessions for 30 students in IMSE 881 and 50 students in IMSE 643
Contents: simplex methods, duality theory, integer programming, transportation methods, PHP and HTML coding

RESEARCH MENTORING & ADVISING EXPERIENCE

❖ Anh T Vo, Master Student, UCSD	2020-2021
❖ Maya Niyogi, Undergraduate Student, UT Austin	2021-2022
❖ Anouka Saha, Undergraduate Student, UT Austin	2021-2022
❖ Shraddha Ramdas Bandekar, Postdoctoral Researcher, UT Austin	2023-2024

JOURNAL REVIEW EXPERIENCE

❖ **Serve as Editor:**

American Journal of Computer Science and Technology (Editorial Board); Mathematics (Special issue guest editor: [Latest Research on Mathematical Biology](#))

❖ **Serve as Reviewer:**

African Journal of Environmental Science and Technology, African Journal of Mathematics and Computer Science Research, American Journal of Operations Research, Axioms, Biology, BMC Infections Diseases, Complexity, Computer & Industrial Engineering, Epidemics, Epidemiology and Infection, Environmental Engineering and Management Journal, Fractal Fract., IEEE Transactions on Cybernetics, IEEE Transactions on Systems, Man and Cybernetics: Systems, Infectious Disease Modeling, Infectious Disease of Poverty, International Journal of Environmental Research and Public Health, International Journal of Mathematics and Mathematical Science, Journal of Advances in Mathematics and Computer Science, Journal of Scientific Research and Reports, Mathematics, NPJ digital medicine, Plos One, Scientific Reports, Sn Applied Sciences, Tropical Medicine and Infectious Diseases

PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

❖ Institute of Industrial and Systems Engineers (IISE)	Since 2017
❖ Institute for Operations Research and the Management Sciences (INFORMs)	Since 2018
❖ The College on Problems of Drug Dependence (CPDD)	Since 2021
❖ Council of State and Territorial Epidemiologists (CSTE)	Since 2022
❖ Models of Infectious Diseases Agent Study (MIDAS)	Since 2022
❖ US Scenario Modeling Hub (SMH)	Since 2022