

Kaiming (Daniel) Bi

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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](#), [Texas Epidemic Public Health Institute](#), and [Center Director for Spatial-Temporal Modeling for Applications in Population Science](#)
- ❖ **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

PEER-REVIEWED JOURNAL PUBLICATIONS

Published:

1. **Kaiming Bi**, Shraddha Ramdas Bandekar, Anass Bouchnita, Annalise Cramer, Spencer Fox, Rebecca Borchering, Matthew Biggerstaff, Lauren Ancel Meyers. “Estimated Impact of 2022-2023 Influenza Vaccines on Annual Hospital Burden in the US”. *Proceedings of the National Academy of Sciences* 122, no. 46 (2025): e2505175122.. IF: 11.6.
2. **Kaiming Bi**, Thuy Nguyen, Boya Peng, Trudy Krause, Cecilia Ganduglia Cazaban, Janelle Rios, Cici Bauer, Catherine Troisi, Eric Boerwinkle, and Aanand D. Naik. "Modeling the Impact of MMR Vaccination Strategies on Measles Outbreaks in Texas." In *JAMA Health Forum*, vol. 6, no. 9, pp. e253992-e253992. American Medical Association, 2025. IF: 11.3.
3. Sara Loo,... **Kaiming Bi**, Lauren Meyers,...Shaun Truelove. "Scenario Projections of COVID-19 Burden in the US, 2024-2025." *JAMA Network Open* 8, no. 9 (2025): e2532469-e2532469. IF: 13.8.
4. Bouchnita, Anass, Shraddha Ramdas Bandekar, **Kaiming Bi**, Behzad Djafari Rouhani, Spencer J. Fox, and Juan A. Garcia. "The interplay between evolutionary and immunological dynamics regulates virus variant emergence and competition." *Mathematical Modelling of Natural Phenomena* 20 (2025): 14. IF: 2.1.
5. **Kaiming Bi**, Shraddha Ramdas Bandekar, Anass Bouchnita, Spencer J. Fox, and Lauren Ancel Meyers. "Annual Hospitalizations for COVID-19, Influenza, and Respiratory Syncytial Virus, United States, 2023–2024." *Emerging Infectious Diseases* 31, no. 3 (2025): 636. IF: 11.4.
6. 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.
7. Anass Bouchnita†, **Kaiming Bi**†, Spencer Fox, Lauren Ancel Meyers. “Projecting Omicron scenarios in the US while tracking”. *Epidemics* (2024): 100746. IF: 5.324.
8. 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.

9. 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
10. **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.
11. **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.
12. **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.
13. **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.
14. **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.
15. 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.
16. **Kaiming Bi**, Yuyang Chen, Songnian Zhao, Yan Kuang, Chih-Hang (John) Wu. "Current Visceral Leishmaniosis Research: A Research Review to Inspire Future Study", *BioMed Research International*, July 2018, DOI: 10.1155/2018/9872095. IF: 3.411.
17. 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.
18. **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.
19. 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.
20. 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.
21. **Kaiming Bi**, "Aim at College-coaching Legends", *Science and Technology Innovation Herald* (In Chinese), ISSN 1674-098X CN 11-5640/N, 2014, (26).
22. **Kaiming Bi**, "Mathematics Modeling of Reconstructing Shredded Documents", *Value Engineering* (In Chinese), ISSN 1006-4311 CN 13-1085/N, 2014, (25).

Published Technical Report:

23. **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).

RESEARCH GRANT

Funded:

- ❖ UTH-SPH PRIME Pilot: Generating a Synthetic Population to Model the Risk of Communicable diseases: Using Influenza as an example, PI 2025
Date: Sep 2025 – Aug 2026, Amount: \$ 25,000, Funded
- ❖ CSTE NU38OT000297, Development of Forecasts and Mathematical Models for COVID-19 and RSV to Inform

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- 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 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

Submitted:

- ❖ NSF IHBEM: Integrating Mobility- and Vaccine Preference–Driven Behavior into Epidemiological Models of Influenza Transmission in Texas, PI 2025
Date: Jan 2026 – Dec 2029, Amount: \$ 1,000,000, Submitted
- ❖ NIH R21: Mapping Heterogeneity in Influenza: Synthetic Population Framework for Precision Prevention in Texas, PI 2025
Date: Jan 2026 – Jan 2028, Amount: \$ 425,640, Submitted
- ❖ TARCC Junior Investigator Research Grant: Synthetic Data and Simulation Model to Inform Dementia Health Policy, PI 2025
Date: Dec 2025 – Nov 2027, Amount: \$ 300,000, Submitted
- ❖ UT Health Houston DPRIT Seed Funding Program: Applying Synthetic Data and Modeling Method to Health Policy and Systems Research in Aging, PI 2025
Date: Dec 2025 – June 2026, Amount: \$ 50,000, Submitted
- ❖ NIH R21: A Machine Learning and Simulation Approach to Multimodal Depression Treatment and Long Term AD/ADRD in Older Adults, Co-I 2025
Date: Jan 2026 – Jan 2028, Amount: \$ 425,640 (My share: \$43,117), Submitted
- ❖ NIH R21: Early warning or not: AI-based national wastewater surveillance data analysis, Co-I 2025
Date: Nov 2025 – Nov 2027, Amount: \$ 425,640 (My share: \$8,000), Submitted
- ❖ NIH R03: Mapping Extreme Heat and Dementia Across Urban and Rural Communities in Texas, Co-I 2025
Date: July 2026 – July 2028, Amount: \$ 152,000 (My share: \$4,000), Submitted

CONFERENCE PUBLICATIONS AND POSTERS

1. **Kaiming Bi**, Shraddha Ramdas Bandekar, Lauren Ancel Meyers. “Estimated Impact of 2022-2023 Influenza Vaccines on Annual Hospital Burden in the US”. MIDAs Annual Meeting 2025.
2. **Kaiming Bi**, ... Aanand D. Naik. "Modeling the Impact of MMR Vaccination Strategies on Measles Outbreaks in Texas." 2025 Healthier Texas Summit.
3. 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.
4. 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.
5. Spencer J. Fox, Anass Bouchnita, Graham C. Gibson, **Kaiming Bi**, Spencer Woody, Linda Pei, Susan Ptak, Kelly Gaither, Michael Lachman1, Lauren Ancel Meyers. “Lessons from recent COVID-19 and Influenza modeling efforts”. CSTE Annual Meeting, 2022.
6. Anass Bouchnita, **Kaiming Bi**, Spencer Fox, Zhanwei Du, Lauren Meyers. “Individual- and population-level immunity modulates key

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epidemiological characteristics of COVID-19." In the 5th Workshop on Virus Dynamics, 2021.

7. **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.
8. **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.
9. 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.
10. **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.
11. Chen, Yuyang, **Kaiming Bi**, Chih-Hang Wu and David Ben-Arieh. "A New Zoonotic Visceral Leishmaniosis Dynamic Transmission Model with Age-Structure." In IISE Annual Conference. Proceedings. Institute of Industrial and Systems Engineers (IISE), 2018.
12. **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.
13. 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. "Modeling the Impact of MMR Vaccination on Measles Outbreaks in Texas" INFORMS Annual Conference, 2025.
2. "Modeling local heterogeneity in risk and transmission" CDC COVID-19/Influenza Modeling Network meeting, 2025
3. "Empowering Epidemic Decision making: A data-driven Approach through scenario modeling" University of Houston, Department of Industrial Engineering, Graduate Seminar, 2024
4. "Data-Driven Epidemic Projection Using Scenario Modeling" INFORMS Annual Conference, 2023.
5. "OR METHODS SUPPORTING INFECTIOUS DISEASE MODELING FIGHT WITH EPIDEMIC" Kansas State University, Department of Industrial and Manufacturing Systems Engineering, Graduate Seminar, 2023
6. "Scenario Projections for the 2023-24 Flu, SARS-Cov2, and RSV" CDC COVID-19/Influenza Modeling Network meeting, 2023
7. "The path to herd immunity: How past infection and vaccination differentially protect a population" INFORMS Annual Conference, 2022.
8. "Omicron BA 4&5 variants scenario projections in United States and Texas." Simulation Modeling Hub Meeting, 2022
9. "How past infection and vaccination differentially protect a population." Ecology & Evolution of Infectious Diseases, 2022
10. "A Novelty Evidence based Convolutional Event Trigger Control System." INFORMS Annual Conference, 2019.
11. "Dynamic Modeling, Analysis and Optimal Control in Epidemic Modeling." IMSE Graduate Seminar
12. "Quantum-based Memetic Algorithm and the applications in Optimization", IISE Annual Conference, 2019
13. "Memetic Algorithm for Optimal Control of Zika Virus Epidemic with Bifurcation Analysis." INFORMS Annual Conference, 2018.
14. "Agent-based model of human behavior in Epidemics." IISE Annual Conference, 2018.
15. "New Evidence Based Optimal Control for Better Sepsis Clinical Treatment." IIE Annual Conference, 2017.

TEACHING EXPERIENCE

- ❖ **PH 3815 Health Policy Analysis, UT HEALTH** Fall 2025
Teach 12 in-class session and 4 lab sessions for both in classroom and online students at PHD level
Contents: Mathematical Modeling, Infectious Disease Modeling, Data Science, Influenza, Vaccine Policy, and Python
- ❖ **IMSE 643, Industrial Simulation (lab session), KSU** Fall 2018, 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
- ❖ **IMSE 881, Linear Programming, 685, Manufacturing Information Systems, KSU** Fall 2015, Spring 2016

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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
❖ Shraddha Ramdas Bandekar, Postdoctoral Researcher, UT Austin	2023-2024
❖ Boya Peng, PhD candidate (Dissertation advisor), UT Health Houston	2025-present
❖ Nahom Work, PhD student (Dissertation advisor), UT Health Houston	2025-present
❖ Benjamin Cristol, PhD candidate (Dissertation advisor), UT Health Houston	2025-present
❖ Thuy Nguyen, Biostatistician (Co-advised), UT Health Houston	2025-present
❖ Peiqi Guo, PhD student (Co-advised, Dissertation advisor), UT Health Houston	2025-present
❖ Tejassvittaa Sahu, MPH student (advisor), UT Health Houston	2025-present
❖ Marlen Salto, MPH student (advisor), UT Health Houston	2025-present
❖ Vivian ton, MPH student (advisor), UT Health Houston	2025-present

JOURNAL REVIEW EXPERIENCE

❖ Serve as Editor:

American Journal of Computer Science and Technology (Editorial Board)

BMC Medical Informatics and Decision Making (Editorial Board)

BMC Public Health (Editorial Board)

Microbiome and One Health (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, NPJ Mental Health Research, Plos One, Scientific Reports, Sn Applied Sciences, Tropical Medicine and Infectious Diseases

GRANT REVIEW EXPERIENCE

❖ Competitive Research Grant (CRG) Program, South Dakota Board of Regents (SD BOR)	2025
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PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

❖ Institute of Industrial and Systems Engineers (IISE) IISE 2026 Modeling & Simulation (M&S) Division Co-Chair	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

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

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❖ 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