

# Kaiming (Daniel) Bi

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

Researchgate: [https://www.researchgate.net/profile/Kaiming\\_Bi2](https://www.researchgate.net/profile/Kaiming_Bi2)

Personal Website: <https://bikaiming93.github.io/>

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## EDUCATION

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- ❖ **Kansas State University**, Manhattan, KS 2020  
Ph.D., Industrial Engineering (Operations Research Field).  
Advisors: Dr. Chih-hang Wu, Dr. David Ben-Arieh  
Dissertation Title “Analytics and Theoretical Studies of Complex Systems and their Applications in Epidemic Models”
- ❖ **Northeastern University (NEU)**, Shenyang, China 2015  
Bachelor of Science, Mathematics (Outstanding Graduate).  
Advisor: Dr. Qingling Zhang  
Thesis Title “Lyapunov Stability Analysis of Linear Time-delay systems”

## RESEARCH EXPERIENCE

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- ❖ **Research Postdoc**, Department of Integrative Biology, UT Austin Aug 2021~ Present  
Develop new network-based mathematical approaches for predicting the spread of infectious diseases  
Design the measures for respiratory diseases including influenza, SARS and COVID-19  
Theoretical study the heterogeneity on evolutionary dynamics and the structure of complex fitness
- ❖ **Research Postdoc**, Division of Infectious Disease and Public Health, UCSD Aug 2020~ Aug 2021  
Systematically investigate the potential for emerging drug use epidemics  
Identify the optimal allocation of resources towards combination of interventions to control them and limit associated harms  
Pilot a targeted mass-media based intervention to increase access to appropriate prevention methods among a specific population at risk of an emerging drug use in real time as identified by the model
- ❖ **Research Assistant**, Health Care Operation Resource Center, KSU Sep 2015~ May 2020  
Build complex dynamic models and agent-based spatial models in epidemic and clinical research field  
Implement numerical, stability, bifurcation and sensitivity analysis for delicate epidemic systems  
Design optimization algorithms to limit the transmission of the disease and reduce the corresponding cost.  
Execute multiple platforms simulation with different types of infectious disease applied with real world data

## WORKING EXPERIENCE

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- ❖ **Data Analyst Summer Intern**, FedEx World Headquarter, Memphis May 2019~Aug 2019
- ❖ **IT Administrator**, IMSE Department, KSU Jul 2016~May 2020

## TEACHING EXPERIENCE

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- ❖ **Lab Instructor**, IMSE, KSU Aug 2018~May 2019  
IMSE 643, Industrial Simulation (Fall 2018 and Spring 2019)  
Teach one hour class per week, 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 Assistance and Research Assistance**, IMSE, KSU Aug 2015~May 2016  
IMSE 881, Integer Programming (Fall 2015) and IMSE 685, Information System (Spring 2016)  
Grade homework and holding help sessions for 30 students in IMSE 881 and 50 students in IMSE 643

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**JOURNAL PUBLICATIONS**

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**Published:**

1. **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.
2. **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:5.944.
3. **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.
4. 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:5.431.
5. **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.
6. 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.
7. **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:5.431.
8. 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:5.944.
9. 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.
10. **Kaiming Bi**, "Aim at College-coaching Legends", *Science and Technology Innovation Herald (In Chinese)*, ISSN 1674-098X CN 11-5640/N, 2014, (26).
11. **Kaiming Bi**, "Mathematics Modeling of Reconstructing Shredded Documents", *Value Engineering (In Chinese)*, ISSN 1006-4311 CN 13-1085/N, 2014, (25).

**Submitted:**

1. **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". *IEEE Transactions on Systems, Man and Cybernetics: Systems* (Under second-round Review). IF: 9.309.
2. Yuyang Chen, **Kaiming Bi**, Chih-Hang (John) Wu, Davide Ben-Arieh. "A Computational Scheme for Stochastic Optimal Control Systems with Variance Constraint". *IET Control Theory & Applications* (Under first-round Review). IF:3.526.
3. 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". *IEEE Transactions on Cybernetics* (Under first-round Review). IF:11.079.
4. 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.
5. **Kaiming Bi**, Jose Luis Herrera-Diestra, Zhanwei Du, Graham Gibson, Maureen Johnson-Leon, Lauren Meyers. "The risk of the Omicron outbreak in the Low and Middle-income countries (LMICs)". *Emerging Infectious Diseases*. IF:6.883.

**Working Papers:**

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## Kaiming (Daniel) Bi

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1. **Kaiming Bi**, Tommi Gaines, Pete Davidson, Steffanie Strathdee, Annick Borquez. "The Contribution of drug sharing to the prescription opioids' epidemic: a dynamic modeling study with heterogeneous analysis". (In draft finalizing)
2. **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)

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### CONFERENCE PUBLICATIONS AND POSTERS

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1. Anass Bouchnita, **Kaiming Bi**, Spencer Fox, Zhanwei Du, Lauren Meyers. "Individual- and population-level immunity modulates key epidemiological characteristics of COVID-19." In the 5<sup>th</sup> Workshop on Virus Dynamics, 2021.
2. **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 83<sup>rd</sup> CPDD Annual Scientific Meeting. Poster. The College on Problems of Drug Dependence (CPDD), 2021.
3. **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.
4. 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.
5. **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.
6. 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.
7. **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.
8. 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.

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### PRESENTATIONS

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1. "A Novelty Evidence based Convolutional Event Trigger Control System." INFORMS Annual Conference, 2019.
2. "Dynamic Modeling, Analysis and Optimal Control in Epidemic Modeling." IMSE Graduate Seminar
3. "Quantum-based Memetic Algorithm and the applications in Optimization", IISE Annual Conference, 2019
4. "Memetic Algorithm for Optimal Control of Zika Virus Epidemic with Bifurcation Analysis." INFORMS Annual Conference, 2018.
5. "Agent-based model of human behavior in Epidemics." IISE Annual Conference, 2018.
6. "New Evidence Based Optimal Control for Better Sepsis Clinical Treatment." IIE Annual Conference, 2017.

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### JOURNAL REVIEW EXPERIENCE

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- ❖ Journal of Advances in Mathematics and Computer Science
- ❖ Journal of Scientific Research and Reports
- ❖ Computer & Industrial Engineering
- ❖ IEEE Transactions on Cybernetics
- ❖ American Journal of Operations Research
- ❖ African Journal of Environmental Science and Technology
- ❖ African Journal of Mathematics and Computer Science Research
- ❖ Complexity

## Kaiming (Daniel) Bi

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- ❖ Environmental Engineering and Management Journal
- ❖ Infectious Disease of Poverty
- ❖ International Journal of Mathematics and Mathematical Science
- ❖ International Journal of Environmental Research and Public Health
- ❖ Biology
- ❖ IEEE Transactions on Systems, Man and Cybernetics: Systems
- ❖ Plos One
- ❖ Math

### AWARDS AND HONORS

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- ❖ Pencil Best Researcher Award: International Research Awards on Infectious Diseases 2021  
Pencil awards the researchers in the motive of encouraging and honoring them for their contributions in their field of expertise
- ❖ Outstanding Dissertation Award of Carl R. Ice College of Engineering 2020  
The best dissertation award among 43 PhD graduates in 2020 at Carl R. Ice College of Engineering
- ❖ IISE Annual Conference Best Paper in Modeling & Simulation Track 2018  
The best conference paper of 29 applications in IISE Modelling & Simulation area
- ❖ Golden Key Outstanding Graduate Research Assistant nominee 2018  
Award for Top 10 graduate students with significant research contributions at Kansas State University
- ❖ Robert I-Jen and Sophia Shui-Kan Jung Graduate Scholarship, \$10,000 2015  
Award for Top graduate students in both academic and research at ENGG college
- ❖ K-State 2025 College of Engineering Scholarship, \$16,000 2015  
Award for Top graduate students in research at ENGG college
- ❖ Second Prize of China Mathematical Contest in Modeling 2013  
Undergraduate Mathematical modeling award in the national wide
- ❖ First Prize of Liaoning Province Mathematical Contest in Modeling 2013  
Undergraduate Mathematical modeling award in the province wide

### REFERENCE

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#### **Chih-Hang (John) Wu**

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