Personal Information

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Education

Ph.D.	2008	University of Wisconsin-Madison, Mathematics
		Advisor: Thomas G. Kurtz, "Multiple scaling methods in chemical reaction networks."
M.A.	2004	University of Wisconsin-Madison, Mathematics
B.S.	2001	Yonsei University, Mathematics

Experience in Higher Education

2019 – Present	Department of Mathematics and Statistics, University of Maryland, Baltimore County Associate Professor
2013 – 2019	Department of Mathematics and Statistics, University of Maryland, Baltimore County Assistant Professor
2011 – 2013	Mathematical Biosciences Institute, Ohio State University, Postdoctoral Fellow
2008 – 2011	School of Mathematics, University of Minnesota-Twin Cities, Postdoctoral Associate

Research Support and Fellowships

SUPPORT

2022 – 2022	Visiting Research Fellowship, Merton College, University of Oxford (during Trinity Term)
2016 – 2020	National Science Foundation, PI, DMS-1620403 (199.9K) "Multiscale stochastic reaction-diffusion algorithms"
2017 – 2017	Early Career Award, Mathematical Biosciences Institute, Columbus, OH
2016 – 2016	NSF Travel Award to visit Isaac Newton Institute, Cambridge UK
2014 – 2014	Summer Faculty Fellowship, UMBC
2013 – 2013	Travel Award to participate in the Society for Mathematical Biology Annual Meeting and Conference, Tempe Arizona
2012 – 2012	Short-term Visitor hosted by Radek Erban, Oxford Centre for Collaborative Applied Mathematics, Oxford UK
2010 – 2010	NSF Travel Award to visit Isaac Newton Institute, Cambridge UK
2009 – 2009	AWM Travel Award to visit Banff International Research Station, Canada

OTHER PARTICIPATING SUPPORT

2018 – 2023	NIH, Senior Personnel: PI - Songon An "A multienzyme metabolic complex for glucose metabolism"

Students

PH.D. STUDENTS

2017 – Present	Luan Chip Nguyen

UNDERGRADUATE STUDENTS

2018 – 2020	Christopher Dunstan (Math/CS), MARC Scholar
2016 – 2018	Jamshaid Shahir (Math/Stat), MARC Scholar, NSF Graduate Research Fellowship (2018)
2015 – 2016	Jane Pan (Math/Stat), URA Scholar
2014 – 2015	Lael Rayfield (Math/Stat)

Abigail Jackson (2013-2015), Jessica Ortega (2013-2015), Kristina Cronise (2013-2015), Benjamin Loreto (2013-2015), Adam Byerly (2013-2016), Seth Friedman (2015-2016), Amarit Matharu (2015-2016), Sam Giannakoulias (2017-2018), Bobak Mccann (2019-2020) ; co-mentored with K.A. Hoffman and P.R. Robinson in UBM

Publications

PEER-REVIEWED JOURNAL PUBLICATIONS

(15) W.R. KhudaBukhsh, H.-W. Kang, E. Kenah, and G.A. Rempala, "Incorporating age and delay into models for biophysical systems," *Physical Biology*, 2020, Vol. 18(1), 015002.

(14) H.-W. Kang and R. Erban, "Multiscale reaction-diffusion algorithms combining Markov chain models with stochastic partial differential equations," *Bulletin of Mathematical Biology*, 2019, Vol. 81, p3185-3213.

(13) B. Xu, H.-W. Kang, and A. Jilkine, "Comparison of deterministic and stochastic regime in a model for Cdc42 oscillations in fission yeast," *Bulletin of Mathematical Biology*, 2019, Vol. 81(5), p1268-1302.

(12) H.-W. Kang, W.R. KhudaBukhsh, H. Koeppl, and G.A. Rempala, "Quasi-steady-state approximations derived from the stochastic model of enzyme kinetics," *Bulletin of Mathematical Biology*, 2019, Vol. 81(5), p1303-1336.

(11) M. Jeon, H.-W. Kang, and S. An, "A mathematical model for enzyme clustering in glucose metabolism," *Scientific Reports*, 2018, Vol. 8, p2696.

(10) J. Kim, G.A. Rempala, and H.-W. Kang, "Reduction for stochastic biochemical reaction networks with multiscale conservations," *SIAM Multiscale Modeling and Simulation*, 2017, Vol. 15(4), p1376-1403.

(9) A. Caicedo-Casso, H.-W. Kang, S. Lim, and C.I. Hong, "Robustness and period sensitivity analysis of minimal models for biochemical oscillators," *Scientific Reports*, 2015, Vol. 5, p13161.

(8) J. Hu, H.-W. Kang, and H.G. Othmer, "Stochastic analysis of reaction-diffusion processes," *Bulletin of Mathematical Biology*, 2014, Vol. 76(4), p854-894.

(7) H.-W. Kang, T.G. Kurtz, and L. Popovic, "Central limit theorems and diffusion approximations for multiscale Markov chain models," *Annals of Applied Probability*, 2014, Vol. 24(2), p721-759.

(6) H.-W. Kang, M. Crawford, M. Fabbri, G. Nuovo, M. Garofalo, S.P. Nana-Sinkam, and A. Friedman, "A mathematical model for microRNA in lung cancer," *PLoS One*, 2013, Vol. 8(1), e53663.

(5) H.-W. Kang and T.G. Kurtz, "Separation of time-scales and model reduction for stochastic reaction networks," *Annals of Applied Probability*, 2013, Vol. 23(2), p529-583.

(4) H.-W. Kang, "A multiscale approximation in the heat shock response model of E. coli," *BMC Systems Biology*, 2012, Vol. 6(1), p143.

(3) H.-W. Kang, L. Zheng, and H.G. Othmer, "The effect of the signaling scheme on the robustness of pattern formation in development," *Interface Focus*, 2012, Vol. 2(4), p465-486.

(2) H.-W. Kang, L. Zheng, and H.G. Othmer, "A new method for choosing the computational cell in stochastic reaction-diffusion systems," *Journal of Mathematical Biology*, 2012, Vol. 65(6-7), p1017-1099.

PEER-REVIEWED BOOK CHAPTERS

(1) R.L. Brown, E. Camacho, E.G. Cameron, C. Hamlet, K.A. Hoffman, H.-W. Kang, P.R. Robinson, K.S. Williams, and G.R. Wyrick, "A stochastic model of the melanopsin phototransduction cascade," *IMA Volumes in Mathematics and its Applications: Applications of Dynamical Systems in Biology and Medicine*, 2015, Vol. 158, p175-195.

WORKS SUBMITTED

(16) H.-W. Kang, L. Nguyen, S. An, and M. Kyoung, "Mechanistic insights of glucosome condensate formation by stochastic modeling approaches," bioRxiv 2022.06.27.497813, under review, 2022.

(17) R. Erban and H.-W. Kang, "Chemical systems with limit cycles," arXiv:2211.05755, under review, 2022.

Presentations

ORGANIZED CONFERENCE AND MINI-SYMPOSIUM

2022 October   American Institute of Mathematics SQuaRE (Structured Quartet Research Ensembles) on "Multiscale approximations of the Togashi-Kaneko model" with W.R. KhudaBukhsh, L. Popovic, G.A. Rempala, and R. Williams

2022 September   European Conference on Mathematical and Theoretical Biology, Minisymposium co-organizer with W.R. KhudaBukhsh "Stochastic biochemical reaction networks"

2022 July   Society for Industrial and Applied Mathemtics Annual Meeting, Minisymposium co-organizer with Changho Kim "Stochastic modeling and simulation methods in biology and chemistry"

2021 June   Society for Mathematical Biology Annual Meeting, Minisymposium co-organizer with W.R. KhudaBukhsh "Stochastic methods for biochemical reaction networks"

2020 August   Society for Mathematical Biology Annual Meeting, Minisymposium co-organizer with W.R. KhudaBukhsh "Stochastic methods for epidemiology and biochemical reaction networks"

2019 December   Latin American Congress of Probability and Mathematical Statistics, Contributed session co-organizer with W.R. KhudaBukhsh "Asymptotic and multi-scale analysis of stochastic biological systems"

2019 July   Society for Mathematical Biology Annual Meeting, Minisymposium co-organizer with G.A. Rempala, "Stochastic models in micro and macro biological systems"

CONFERENCE TALKS/POSTERS DURING PAST THREE YEARS

1. Joint ECMTB/SMB Meeting (September 2022), *How to determine the computational cell size*; University of Heidelberg, Heidelberg, Germany

2. Southeastern Probability Conference (August 2022), *Multiscale approximations in stochastic biochemical networks*; University of North Carolina, Chapel Hill, NC

3. The SIAM Annual Meeting (July 2022), *Stochastic modeling of metabolic enzyme complexes*; David L. Lawrence Convention Center, Pittsburgh, PA (presented online)

4. The ISI World Statistics Congress (June 2021), *Stochastic modeling of metabolic enzyme complexes*; (presented online)

5. The SMB Annual Meeting and Conference (June 2021), *A stochastic model for enzyme kinetics in glucose metabolism*; University of California, Riverside, CA (presented online)

6. The SMB Annual Meeting and Conference (August 2020), *A stochastic model for enzyme kinetics in glucose metabolism*; (presented online)

7. MBI Virtual Workshop on Mathematical and Computational Methods in Biology (May 2020), *A stochastic model for enzyme clustering in glucose metabolism*; MBI, Ohio State University, Columbus, OH (presented online)

8. Philip Maini's 60th Birthday Workshop (September 2019), *Comparing stochastic and deterministic models of enzyme clustering in glucose metabolism* (Poster); University of Oxford

9. The SMB Annual Meeting and Conference (July 2019), *A mathematical model for enzyme clustering in glucose metabolism*; University of Montreal

10. Conference on Multiscale Modeling in Biology (May 2019), *A mathematical model for enzyme clustering in glucose metabolism*; University of Minnesota, Minneapolis, MN

SEMINAR AND COLLOQUIUM TALKS DURING PAST THREE YEARS

8. Group Meeting (May 2022), *Deterministic and stochastic models for glucose metabolism*; University of Oxford, UK

9. Stochastic Systems Seminar (March 2022), *Stochastic modeling of enzyme-catalyzed reactions in biology*; University of California, San Diego, CA (presented online)

10. Seminar on the Mathematics of Reaction Networks (MoRN) (September 2021), *Stochastic modeling of reaction-diffusion processes in biology*; Harvard University/Politecnico di Torino/University of Copenhagen/University of Vienna (presented online)

11. The Cold Place Mathematical Biology Seminar (June 2021), *Stochastic modeling of enzyme-catalyzed reactions in biology*; University of Minnesota, Twin Cities, MN (presented online)

12. Seminar (March 2021), *Multiscale approximations in stochastic biochemical networks*; Politecnico di Torino, Italy (presented online)

13. Mathematical Biology Seminar (February 2021), *Stochastic modeling of reaction-diffusion processes in biology*; University of Pennsylvania, Philadelphia, PA (presented online)

14. Mathematical Biology and Ecology Seminar (October 2020), *Stochastic modeling of reaction-diffusion processes in biology*; University of Oxford, UK (presented online)

15. Applied Mathematics Seminar (September 2019), *Stochastic modeling and simulation of biochemical networks*; University of Notre Dame, South Bend, IN

Service

SERVICE TO THE DEPARTMENT

2022 – Present	Hiring Committee Co-Chair
2022 – Present	Differential Equation Seminar Organizer
2019 – Present	Graduate Program Committee Members in Applied Mathematics
2022 – 2022	Postdoc Hiring Committee Members in Applied Mathematics
2019 – 2019	Promotion and Tenure (sub)Committee Members
2015 – 2019	Applied Mathematics Colloquium Organizer
2015 – 2018	CNMS Award Committee Member
2014 – 2015	Pi Mu Epsilon Undergraduate Student Association co-Mentor with K. Nanes
2013 – 2014	Hiring Committee Member
2013 – 2014	Undergraduate Program Committee Member

SERVICE TO THE UNIVERSITY AND COMMUNITY

2015 – Present	Undergraduate Research and Creative Achievement Day Committee Member
2019 – 2020	Graduate Council Committee Member

SERVICE TO THE PROFESSION

2017 – 2020	National Science Foundation Panel/Ad hoc reviewer

Referee in Journal of Chemical Physics, Bulletin of Mathematical Biology, Journal of Mathematical Biology, Journal of Theoretical Biology, Journal of the Royal Society Interface, Annals of Applied Probability, Journal of Mathematical Chemistry, SIAM Journal on Applied Mathematics, SIAM Journal on Applied Dynamical Systems (2011-Present)

MEMBERSHIP

Society for Mathematical Biology, Society for Industrial and Applied Mathematics