Minchul Kang

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Citizenship

USA

EMPLOYMENT HISTORY:

- 08/22/2016-Present Assistant Professor, Texas A&M University-Commerce, Commerce, TX, USA
  - Hours per week: 40
  - Duties, Accomplishments, and Related Skills: Teaching and research
- 08/11/2012-05/14/2016 Assistant Professor, St.Thomas University, Miami Garden, FL, USA
  - Hours per week: 40
  - Duties, Accomplishments, and Related Skills: Teaching and research
- 06/01/2008-07/31/2012 Research Fellow, Vanderbilt School of Medicine, Nashville, TN, USA
  - Hours per week: 40
  - Duties, Accomplishments, and Related Skills: Research and statistical supports
- 01/01/2005-05/31/2008 Research Fellow, Vanderbilt University, Nashville, TN, USA
  - Hours per week: 40
  - Duties, Accomplishments, and Related Skills: Research in applied mathematics

EDUCATION:

01/31/2005 Ph.D. Mathematics
University of Minnesota, Twin Cities, MN, USA

12/28/2001 M.S. Mathematics (Computational Neuroscience Minor)
University of Minnesota, Twin Cities, MN, USA

02/25/1997 B.S. Mathematics (Summa Cum Laude | Mathematics Education Minor)
Korea University, Seoul, South Korea

2023 M.S. (expected) Statistics (Applied Analytics & Data Science Emphasis)
Texas A&M University, College Station, TX, USA

CERTIFICATIONS:

- 05/2022 SAS Certified Associate: Programming Fundamentals Using SAS 9.4
- 01/2022 SOA Exam P (Probability)
- 09/2021 FOCI (Focused Online Collaborative Interactions) Series 7 by University of Texas, Austin
  Strengthening Conceptual Understanding in Introductory Statistics

RELEVANT COURSEWORK:

- Graduate Mathematics Courses (93 credit hours):

Real analysis	Partial Differential Equations	Functional Analysis
Numerical Analysis	Applied Mathematics	Dynamical systems

Mathematical Biology Computational Neuroscience

- Graduate Statistics course (18 credits completed)

Mathematical Statistics	Statistical Computation	Statistical Method I
Regression	Bayesian Statistics	Machine learning

- Graduate Statistics course (In progress)

Statistical Method II Applied analytics

- Undergraduate Mathematics/Statistics Courses (69 credits hours)

Calculus	Multivariate Calculus	Real Analysis
Complex variables	Abstract Algebra	Number theory
Differential equations	Linear algebra	Topology
Geometry	Probability	Actuarial mathematics

Undergraduate Statistics course (6 credits)

Mathematical Statistics Statistical Computation

Research/Computational SKILLS:

- Computer and programming
  - MS-Office: words, excel, PowerPoint
  - General Programming: C/C++, Matlab, Mathematica,
  - Statistical Programming R, SAS (Certified), Python, SQL
  - Packages: LaTex, XAAPUT, AUTO, ImageJ, Comsol
- Statistical Data analysis
  - Regression
  - Time series
  - Correlations/Autocorrelation
  - Stochastic process
- Applied Mathematics/Mathematical Biology
  - Mathematical modeling and biological network analysis
  - Dynamical systems and spectral theory
  - Partial differential equations and Reaction-Diffusion process
  - Computational Neuroscience
- Fluorescence microscopy
  - Fluorescence Image analysis
  - Fluorescence recovery after photobleaching
  - Fluorescence correlation spectroscopy
- Membrane biophysics
  - The diffusion process of lipids and membrane proteins
  - Protein -lipids, protein-protein interactions

PUBLICATIONS:

	All	Since 2018
Citations	1032	502
h-index	12	11
i10-index	14	12

Source: Google scholar (https://scholar.google.com/citations?user=TKNbqtgAAAAJ&hl=en)

1. Minchul Kang. Simple derivations of exact analytic solutions of the Susceptible-Infected-Recovered (SIR) epidemic model (Submitted to Epidemiologic Methods)
2. Minchul Kang. (2022) Regression analysis of confocal FRAP and its application to diffusion in membranes J Fluores. 32(3):1031–1038
3. Kyung Il Lee, Natasha Astudillo, and Minchul Kang. (2020) A simple derivation of diffusion Fluorescence Correlation Spectroscopy equations. J. Fluoresc. 30(3):455-462.
4. Minchul Kang. (2020) Diffusion theory for cell membrane fluorescence microscopy., in Fluorescent Methods for Investigation of Living Cells and Microorganisms. Intechopen, London, UK
5. Minchul Kang. (2019) A novel computational framework for D(t) from Fluorescence Recovery after Photobleaching data reveals various anomalous diffusion types in live cell membranes. Traffic. 20(11):867-880
6. Minchul Kang. (2018) Straightforward Derivation of Fluorescence Correlation Spectroscopy Equation of a Diffusion Process for Undergraduates. Proceedings of the International Conference on Industrial Engineering and Operations Management
7. Minchul Kang, Manuel Andreani, and Anne Kenworthy. (2015) Normalizations, scaling, and photofading corrections for FRAP data analysis and their implications. PLoS ONE 10(5):e0127966.
8. Minchul Kang, Charles Day, Anne Kenworthy, and Emmanuele DiBenedetto. (2012) Simplified equation to extract diffusion coefficients from confocal FRAP data. Traffic. 13(12):1589–1600.
9. Charles Day, Lewis Kraft, Minchul Kang, and Anne Kenworthy. (2012) Analysis of protein and lipid dynamics using confocal fluorescence recovery after photobleaching. Curr Protoc Cytom. Chapter 2:Unit2.19.
10. Daniel Chinnapen, Ramiro Massol, Wan-Ting Hsieh, Yvonne Welscher, David Saslowsky, Lydia Kaoutzani, Eelke Brandsma, Hyejung Park, Jessica Wagner, Kimberly Drake, Minchul Kang, Thomas Benjamin, David Ullman, Cathy Costello, Anne Kenworthy, Tobias Baumgart, and Wayne Lencer. (2012) A native lipid-sorting pathway from PM to ER for the unsaturated species of ganglioside GM1 Dev Cell. 23(3):573-86.
11. Maria Kiskowski, Roger Jackson, Xiaohong Li, Minchul Kang, Simin Hayward, and Neil Bhowmick. (2011) Role for Stromal Hetrogeneity in Prostate Tumorigenesis. Cancer Res., 71(10):3459-3470
12. Minchul Kang, Emmanuele DiBenedetto, and Anne Kenworthy. (2011) Proposed Correction to Feder's Anomalous Diffusion FRAP Equations. Biophys J., 100(3): 791-792
13. Minchul Kang, Charles Day, Kimberly Drake, Anne Kenworthy, and Emmanuele DiBenedetto. (2010) A quantitative approach to analyze binding diffusion kinetics by confocal FRAP. Biophys J., 99(9): 2737–2747
14. Kimberly Drake, Minchul Kang, and Anne Kenworthy (2010) Nucleocytoplasmic distribution and dynamics of the autophagosome marker EGFP-LC3. PLoS ONE 5(3): e9806.
15. Minchul Kang, and Anne Kenworthy (2009) Complex Applications of Simple FRAP on Membranes., in Biomembrane Frontiers, R. Faller et. al. editors, Humana Press, New York, USA
16. Minchul Kang and Hans Othmer (2009) Spatiotemporal characteristics of calcium dynamics in astrocytes. Chaos, 19:037116.
17. Minchul Kang, Charles Day, Kimberly Drake, Anne Kenworthy, and Emmanuele DiBenedetto. (2009) A generalization of theory for two-dimensional fluorescence recovery after photobleaching applicable to confocal laser scanning microscopes., Biophys J., 97(5):1501-11.
18. Minchul Kang and Anne Kenworthy (2008) A closed-form analytic expression for FRAP formula for the binding diffusion model., Biophys J., 95(2):L13-5.
19. Minchul Kang and Hans Othmer (2007) The variety of cytosolic calcium responses and possible roles of PLC and PKC., Phys Biol, 4: 325-343.

PATENTS AND INVENTIONS

1. Minchul Kang (2020) System for Measuring Anomalous Diffusion Using Fluorescence Recovery After Photobleaching and Associated Methods
    - Provisional Application | 01/16/2020 | Application #: 62/962,070
    - Non-Provisional Application | 01/28/2020 | Application #: 17/083,365 (Patent Pending)
    - https://uspto.report/patent/app/20210223174
2. Minchul Kang (2020) Portable tennis topspin practice rebounder
    - Provisional Application | 01/16/2020 | Application #: 63/142,824 (Expired)

GRANTS AND FUNDING

- Earned lineage to the national I-Corps program and the $50k grant
- The Texas Higher Education Coordinating Board Open Education Resources (OER) Grant Program Grant | THECB Award Number: 23849 ($5,000)
- Presidential Graduate Assistant Research Grant
- TAMUC Faculty development grant

TEACHING EXPERIENCES

Precalculus (5 semesters)
Calculus 2 (7 semesters)
Differential Equations (5 semester)
Linear algebra (2 semesters)
Abstract algebra (2 semesters)
Partial Differential Equations (3 semesters)
Introductory Statistics (6 semesters)
Calculus 1 (9 semesters)
Calculus 3 (7 semesters)
Applied Mathematics (6 semesters)
Number theory (3 semesters)
Dynamical Systems (2 semesters)
Discrete mathematics (7 Semesters)
Mathematical Statistics/Probability (3 semesters)

PROFESSIONAL ASSOCIATIONS:

- American Mathematical Society
- Biophysical Society

THESIS AND CAPSTONE PROJECTS ADVISED

1. Anil Ghimire (2022)
    - Capstone Project: Mathematical modeling of fake news spreading on SNS network and its control strategy
2. Bashar Aladwan (2021)
    - Capstone Project: Sensitivity analysis of the interplay of face masks and social distancing for controlling infection spread and protecting from COVID-19
3. Peizhi Zhu (2020-2021)
    - Capstone Project: Regression analysis of 2D CLSM FRAP data
    - Presidential GAR program
4. Natasha Astudillo (2017-2019)
    - MS Thesis: Anomalous Diffusion of Cholera Toxin on Cell Membranes Investigated by Fluorescence Correlation Spectroscopy
    - First Place Research Award at 2018 Texas A&M University System Pathways Research Symposium
    - Spirit Airline, Miramar, FL
5. Jedidah Koomson (2016-2018)

- MS Thesis: Mathematical Derivation of Fluorescence Recovery after Photobleaching Models
- First Place Research Award in Graduate Science and Engineering at 2018 Texas A&M University-Commerce Annual Research Symposium
- Goldman Sachs & Co, Dallas TX

HONORS AND AWARDS:

1. Certificate of appreciation (2022)
    - SCUDEM (SIMIODE Challenge Using Differential Equations Modeling)
2. Undergraduate research mentoring award (2014)
    - St. Thomas University
3. Academic Affairs Transformational Leadership Award (2013)
    - St. Thomas University
4. Certificate of appreciation (1993)
    - 2nd infantry division, US Army
5. Certificate of achievement (1992)
    - 1st battalion 503rd Infantry Regiment, 2nd ID, US Army