

# Seul ki Kang

<b>CONTACT INFORMATION</b>	OSS 210 Mathematics, 2115 Summit Avenue, St. Paul, MN 55105	Email:kang4820@stthomas.edu
<b>PROFESSIONAL EXPERIENCE</b>	<b>UNIVERSITY OF ST.THOMAS</b> Assistant Professor of Mathematics and Actuarial Science	<i>St. Paul, MN</i> <i>2022-Present</i>
<b>EDUCATION</b>	<b>GEORGIA STATE UNIVERSITY</b> Ph.D., Risk Management and Insurance Dissertation: "RISK ANALYSIS AND UNCERTAINTY QUANTIFICATION IN INSURANCE RATEMAKING" <ul style="list-style-type: none"><li>• Advisor: Professor Liang Peng</li><li>• GPA: 4.09/4.30</li></ul>	<i>Atlanta, GA</i> <i>2017-2022</i>
	<b>TEXAS A&amp;M UNIVERSITY</b> Ph.D., Mathematics Dissertation: "MULTISCALE SIMULATION AND UNCERTAINTY QUANTIFICATION TECHNIQUES FOR RICHARDS' EQUATION IN HETEROGENEOUS MEDIA" <ul style="list-style-type: none"><li>• Co-Advisor: Professor Yalchin Efendiev, Professor Raytcho Lazarov</li><li>• GPA: 3.95/4.00</li></ul>	<i>College Station, TX</i> <i>2007- 2012</i>
	<b>KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)</b> Bachelor of Science, Division of Mathematics, Department of Mathematics. <ul style="list-style-type: none"><li>• Advisor: Professor U JIN CHOI</li><li>• 100% Tuition waived</li><li>• One year experience as an exchange student at KTH, Stockholm, Sweden</li><li>• Major GPA: 3.76 Overall GPA: 3.38</li></ul>	<i>Daejeon, Korea</i> <i>2002- 2007</i>
<b>RESEARCH INTERESTS</b>	<ul style="list-style-type: none"><li>• Actuarial mathematics</li><li>• Extreme value theory in finance and insurance</li><li>• Statistical modeling of finance and insurance losses</li><li>• Econometrics</li><li>• Nonparametric statistics</li><li>• Empirical likelihood methods</li><li>• Bayesian statistics</li><li>• Computational modeling</li><li>• Uncertainty quantification</li></ul>	
<b>PUBLICATIONS</b>	<ul style="list-style-type: none"><li>• "Forecasting Quantiles Via Copula for Longitudinal Insurance Data"(In preparation)</li><li>• "Three-Step Risk Inference In Insurance Ratemaking", Yanxi Hou, Seul Ki Kang, Steve Lo, Liang Peng, Insurance: Mathematics and Economics 2022.</li><li>• "Two-Step Risk Analysis In Insurance Ratemaking", S.Kang, L.Peng, A. Golub, Scandinavian Actuarial Journal 2021.</li><li>• "Risk analysis with categorical explanatory variables", S.Kang, L.Peng, H. Xiao, Insurance: Mathematics and Economics 2020.</li><li>• "Spectral multiscale finite element for nonlinear flows in highly heterogeneous media: A reduced basis approach", J Galvis, SK Kang, Journal of Computational and Applied Mathematics 2014.</li><li>• "Robust multiscale iterative solvers for nonlinear flows in highly heterogeneous media", Y. Efendiev, J. Galvis, S.Kang, R.Lazarov, Numerical Mathematics: Theory, Methods and Applications 2012.</li></ul>	
<b>RESEARCH EXPERIENCE</b>	<b>GEORGIA STATE UNIVERSITY, Department of Risk Management and Insurance</b> Graduate Researcher: Advisor: Professor Liang Peng. Risk analysis and uncertainty quantification in insurance ratemaking <ul style="list-style-type: none"><li>• Made inferences about risk measures, such as VaR or Expected Shortfall, for insurance claims.</li></ul>	<i>Atlanta, GA</i> <i>2017-2022</i>

- Developed more generalized two steps quantile regression techniques for measuring VaR and applied it in insurance ratemaking.
- Applied generalized Pareto distribution(GPD) for measuring risks with high risk level and used quantile regression for setting a dynamic threshold of GPD.
- Proposed several techniques for measuring uncertainty regarding proposed inference.

**TEXAS A&M UNIVERSITY, Department of Mathematics**

*College Station, TX*

Graduate Researcher: Advisor: Professor Yalchin Efendiev and Professor Raytcho Lazarov

*2009-2012*

Multiscale simulation and uncertainty quantification techniques for Richards' equation in heterogeneous media

- Developed multiscale finite element methods and uncertainty quantification techniques for Richards' equation, a mathematical model to describe fluid flow in unsaturated porous media.
- Developed an accurate coarse-scale numerical method by constructing an effective multiscale map that captures the multiscale features of the large-scale solution without resolving the small scale details
- Present numerical methods based on upscaling techniques and the Markov chain Monte Carlo method for uncertainty quantification applications for Richards' equation

**FRAUNHOFER INSTITUTE FOR INDUSTRIAL AND MATHEMATICS, ITWM**

*Kaiserslautern, Germany*

Visiting scholar: Advisor: Professor Yalchin Efendiev and Professor Oleg Iliev

*2011*

- Studied Richards' equation using multiscale finite element method and uncertainty quantification method.
- Applied multiscale finite element method to paper machine problem.

**TEXAS A&M UNIVERSITY, Institute for Scientific Computation**

*College Station, TX*

Summer Graduate Researcher: Advisor: Professor Guido Kanschat

*2008*

- Studied Wavelet theory and conservation law.
- Discovered the best way to solve wavelet equations with the fewest errors using several numerical methods.

**KAIST NUMERICAL ANALYSIS LABORATORY**

*Daejeon, Korea*

*2006*

Undergraduate Researcher: Advisor: Dr. Doyoung Kwak

- Found the approximate values of several Ordinary Differential Equations and checked their values using a computational tool, such as C++.
- Found recent articles about an option market and discussed about the newly accepted theories.

**TEACHING EXPERIENCE**

**UNIVERSITY OF ST.THOMAS**

*St. Paul, MN*

MATH101 " Finite Mathematics" : Fall 2022, Fall 2023, Fall2024

ACSC264 " Theory of Interest" : Fall 2022, Spring 2023, Fall 2023(UEC)

ACSC375 " Short-term Actuarial Models": Spring 2023, Spring 2024

ACSC471 "Foundations of Actuarial Mathematics": Fall 2025

**GEORGIA STATE UNIVERSITY**

*Atlanta, GA*

Spring 2021: AS 4360 "Ratemaking & Loss Reserving",

Highlighted in the 2021 CAS University Award winner.

Spring 2020: AS 4360 "Property and Casualty(P&C) Catastrophe Modeling and Ratemaking"

**TEXAS A&M UNIVERSITY**

*College Station, TX*

*2007 - 2011*

Experience Graduate Teaching Assistant, Department of Mathematics

- Recitation TA: Calculus I, Calculus II
- Grader (Graduate level): Analysis for Applications, Algebra, Linear Algebra, Partial Differential Equations
- Grader (Undergraduate level): Advanced Calculus I

**PRESENTATIONS**

**SRIA(Southern Risk and Insurance Association) 2021**

*Online*

Presented at SRIA 2021 about "Three-Step Risk Inference in Insurance Ratemaking."

*November 2021*

**WSSAF(Waterloo Student Conference in Statistics, Actuarial Science and Finance) 2021**

*Waterloo, Canada(Online)*

Presented at WSSAF 2021 about "Three-Step Risk Inference in Insurance Ratemaking."

*November 2021*

**SETA(The 15<sup>th</sup> International Symposium on Econometric Theory and Applications) 2019**

*Osaka, Japan*

Presented at SETA 2019 about “Risk analysis with categorical explanatory variables.”

June 2019

**KSTLC(Korean Students Technical & Leadership Conference ) 2012**

Chicago, IL

Presented poster at KSTLC 2012 about “Uncertainty quantification methods for characterizing vadose zone.”

March 2012

**JMM(Joint Mathematics Meetings) 2012**

Boston, MA

Presented at JMM 2012 about “Multiscale simulations for Richards' equation in high-contrast media and applications.”

January 2012

### **INVITED TALK**

Kaiserslautern, Germany

Presented at ITWM Institute about Richards' equation and its numerical solving methods.

March 2011

### **INDUSTRY WORK EXPERIENCE**

**SAMSUNG FIRE AND MARINE INSURANCE CO.**

Seoul, Korea

Senior Manager

2012 - 2017

- Worked at Auto Insurance Pricing Division
- Model loss and cost distribution using Emblem
- Model loss reserving using SAS and R
- Developed and managed the web crawling and scraping tools using Java.
- Managed and analyzed big data using SQL, Java, R, and Tableau

**WOORI INVESTMENT & SECURITIES CORPORATION**

Seoul, Korea

Intern/Research Assistant

2007- 2007

- Worked at Research center.
- Assisted Analyst who is specialized in analyzing construction companies' data.

### **EXAM**

- SOA Exam P
- SOA Exam FM
- SOA Exam MFE
- SOA Exam C
- SOA Exam SRM
- SOA Exam FAM-L

### **SKILLS**

#### **COMPUTER SKILLS:**

- **Languages:** JAVA, Visual Basic, SQL
- **Mathematical Tools:** R, SAS, STATA, Matlab, Maple, WinBUGS
- **Systems:** Windows, Linux
- **Others :** MS Office, Emblem, Tableau, LaTex

**LANGUAGE SKILLS:** Native: Korean, Fluent in Japanese, and English.

### **AWARDS**

**CEAR SCHOLAR FUNDING**

Merit-based scholarship awarded to Ph.D. students

2021

**VISITING SCHOLAR GRANT, Fraunhofer Institute for Industrial and Mathematics ITWM**

Funded for researching as visiting scholar

2011

**NATIONAL SCIENCE FOUNDATION GRANT, Computational Mathematics**

Partially supported research

2010-2012

**NATIONAL SCIENCE FOUNDATION GRANT, Earth Sciences Research**

Partially supported research

2009-2012

**INSTITUTE FOR APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE FELLOWSHIP**

Funded Ph.D. student who is dedicated to the promotion of leading edge research within the interdisciplinary field broadly known as the computational sciences

2010- 2012

**KAIST SCHOLARSHIP**

Merit-based scholarship awarded to students

2002- 2007

**SAMSUNG HUMAN TECHNOLOGY THESIS AWARDS**

Competition for young scientists' thesis works, Earned Prize for Encouragement(4<sup>th</sup> place) with thesis "Study of Stabilization of Heavy Metal Ion in EAF Dust"  
2002