MINKUN KIM

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PERSONAL STATEMENT

A dedicated scholar with a unique background and solid research experience in solving complex quantitative challenges in finance. Proficient in Bayesian Nonparametric and a wide range of statistical methods for prediction, uncertainty quantification, risk management, and more. Possess a deep understanding of the underlying mathematical theories and derivations, and enjoying applying and customizing these frameworks to address specific, real-world problems effectively.

Tools: R, Python, Excel, C++, SQL, Tableau, PowerBI, Adobe Illustrator, Rhino3D
Financial Mathematics: Stochastic Calculus, Matrix Calculus, Differential Equation, Time Series, Simulation
Machine Learning proficiency: Generative, Discriminative, Parametric, Nonparametric
Data Preprocessing: Cleaning, Reduction, Discretization, Transform
Quantitative Financial Research: Risk modeling, Valuation modeling and scientific paper writing

EDUCATION AND TRAINING

Ph.D Computing with Research focus on Finance **2020-2025**

ADAPT Centre, Dublin City University, Dublin, Ireland

Research Topic: Bayesian Parametric/Nonparametric Risk Modeling with Incomplete Data in Actuarial Practice

Thesis: Insurance Risk Premium Development with Model Risk, 2025; Available online at: (in progress)

Related Publications

1) **Dirichlet Process Log Skewnormal Mixture with Missing at Random Covariate in Insurance Practice**
   Journal Econometrics, 2023, 11(4), 24; Available online at: (https://www.mdpi.com/2225-1146/11/4/24)
2) **Bayesian Hierarchical Risk Premium Modeling with Model Risk: Addressing Non-Differential Berkson Error**
   Journal Applied Sciences, 2024, 15(1), 210; Available online at: (https://doi.org/10.3390/app15010210)
3) **Bayesian Nonparametric Risk Premium Modeling with Model Risk: Dirichlet Process Log Skewnormal Convolution to Address Non-Differential Berkson Error**
   Annals of Actuarial Science, 2025; Available online at: (in progress)

Institute and Faculty of Actuaries (IFoA), UK, Actuarial Qualification **2022-present**

Completed Exams: CS1-Actuarial Statistics I, CM1-Actuarial Mathematics I, CB2-Business Economics

H.Dip Statistics and M.Sc Computing **2017-2019**

School of Mathematics and Statistics, University College Dublin, Dublin, Ireland

School of Computing, Dublin City University, Dublin, Ireland

Key Modules: Multivariate Analysis, Bayesian Inference, Data Modelling, Predictive Models (with SAS/R), Monte-Carlo Inference, Data programming with Python, Mathematical Statistics, Machine Learning, Statistical Data Analysis, Mathematical Methods, Big Data Management, Visualization, etc.

Research Topic: Data Visualization & Statistical Analysis (Commissioned by Dublin City Council)

Using Google Map API and Tableau to visualise the effects of walkability on house prices change in Dublin with WLS regression. Available online at: (https://arxiv.org/abs/2310.07563)

B.Sc Urban Engineering and Architecture (with merit-based full scholarship) **2008-2016**

School of Engineering, Hongik University, Seoul, South Korea

School of Architecture, Rice University, Houston, USA

Key Modules: Core Design Studio, Architectural Theory, Building Technology (I.Frame/II.Shell/III.Envelope/IV.Environment), Totalization Design Studio(I/II), Master Thesis(I/II), Urban Planning, University Physics, Chemistry and Lab, Applied Mathematics, Engineering Mechanics, Engineering Mathematics, etc.

CAREER EXPERIENCE

Research Assistant **2019-2020**

ARC-SYM (Advanced Research Computing for Complex Systems Modelling Centre), Ireland

- **Bioinformatics project:** Helped the physicians from St.Vincent University Hospital in Dublin, developing research w.r.t Gene Regulatory Network: (1) Dimensionality reduction, (2) Feature Selection: Modeling with Diverse Risk Factors/Determinants (genetic/clinical), (3) Refining GRS Risk Factors in the model; Integration between Traditional Risk Factors, Genetic Variants (SNP, GRS, etc.)

- **InsurTech project:** Helped researchers in FINEOS Actuarial Software company to improve predictions of employee's disability benefit durations. This involves the improvement of the correct case assignment, automation of high frequency predictable cases freeing up staffs for better management and intervention on unpredictable cases, thereby improving productivity, reducing out-of-work durations and achieving better outcomes for insurers.

Research Intern **2014-2015**

Seoul Housing and Communities Corporation (SH Corporation), South Korea

- **Urban re-generation project:** Helped urban developers with site selection, acquisition, planning, design, space branding, and content producing, etc. I contributed to identify key areas for city redevelopment, leveraging analytical skills (using ArcGIS) to pinpoint high-potential locations ripe for revitalization. This involved conducting thorough mathematical analyses to advocate for the inclusion of these areas in redevelopment plans.

Soldier **2002-2005**

Military Supply Specialist & Anti-Aircraft Gun (AAG) Operator, Air Force, Republic of Korea

OTHER INFORMATION

Extra-Curricular Activities and Interests

- **Freelance work 2019**– Helped small online shopping business examine Click Through Rate and Conversion Rate, trying 3 different A/B testing approaches such as (1) CI & Bootstrapping, (2) Simulating directly from the Null Hypothesis, (3) Regression: OLS, Logistic, KNN, SVM.
- **International MediaEval Competition 2018** – Achieved 45% accuracy from my MLP Structure that I designed to predict memorability scores for videos, which reflect the probability of a video being remembered by majority of people. Using an Autoencoder for Greedy Layer-Wise Pre-Training and Learning Rate Scheduling for SGD. Available online at (https://www.github.com/mainkoon81).
- **Twitter better Rating Algorithm with Computer Vision 2017** – Developed tweeting recognition algorithm as part of a web application for dog lovers. Web scrapping and investigating Twitter users' retweeting behavior, I first brought up an insight on how to get more retweets and favorites. This is followed by my tweeting recognition algorithm by taking any user-supplied dog image as input for classification then providing an estimate of the dog's breed to get more retweets and favorites.
- **Recipient of a prize at the Korea Architecture Competition 2009** – Applied Chora's *Liminal Body* concept to the redevelopment of a major commercial street in Jung-gu, Seoul, exploring spatial transitions and urban connectivity and integrating dynamic public spaces with commercial infrastructure.

Hobbies: Tutoring mathematics, and exploring city design concepts driven by economic forces and risk dynamics.