

# Kyungmin Kim

☎ (+82)10-5298-7813 | ✉ kkm959595@postech.ac.kr | 🏠 kmkim95.github.io

## Education

### Pohang University of Science and Technology

PH.D. IN GRADUATE SCHOOL OF ARTIFICIAL INTELLIGENCE, GPA: 3.68/4.3 | ADVISOR: SANGDON PARK

Pohang, Korea

March 2024 -

### Pohang University of Science and Technology

M.S. IN INDUSTRIAL AND MANAGEMENT ENGINEERING, GPA: 3.43/4.3 | ADVISOR: MINWOO CHAE

Pohang, Korea

March 2022 - February 2024

THESIS: MARKOV CHAIN MONTE CARLO-BASED MANUFACTURING PROCESS CONTROL ALGORITHM: AN APPLICATION TO STEEL PLATE PRODUCTION

### Korea University

B.E. IN STATISTICS, GPA: 3.97/4.5

Seoul, Korea

March 2014 - August 2020

## Experience

### Hanyang University

DESIGN INFORMATICS LAB

Seoul, Korea

July 2021 - November 2021

- GENERALIZING THE EXISTING BAYESIAN INFORMATION GAIN (BIG) FRAMEWORK DESIGNED AS THE HUMAN-SYSTEM INTERACTION SYSTEM, DEVELOPED THE STATISTICAL METHODOLOGY, BIGEXPLORE, WHICH SUPPORTS THE HIGH-DIMENSIONAL DESIGN SPACE EXPLORATION.
- UNLIKE THE BIG FRAMEWORK, BIGEXPLORE CAN CAPTURE THE EXPLORATION PATTERN OF THE USER WITHOUT A PRE-DEFINED GOAL. ADDITIONALLY, BIGEXPLORE REDUCES THE COMPUTATIONAL BURDEN OF SEARCHING THE DESIGN SPACE WHICH GROWS EXPONENTIALLY BY THE SIZE OF THE DESIGN SPACE, BY DEVISING AN ALGORITHM THAT REDUCES THE SEARCH SPACE BASED ON THE USER BEHAVIOR.

### Development of the Quality Control Algorithm based on the Predictive Model for Automotive Steel Plates

POSCO

Pohang, Korea

April 2022 - December 2022

- EXPLORATORY DATA ANALYSIS (EDA) TO FIGURE OUT CAUSES OF LOW PREDICTION ACCURACY ON THE SPECIFIC TYPE OF STEEL PLATE AND EDA-BASED DATA ENGINEERING TO ENHANCE THE PREDICTION ACCURACY.
- BASED ON THE PREDICTION MODEL, DEVISED THE PROBABILISTIC QUALITY CONTROL ALGORITHM USING METROPOLIS-HASTINGS ALGORITHM

### Anomaly Detection and Data Calibration for Improving the Statistical Quality Models for Annealing and Plating Process

POSCO

Pohang, Korea

February 2023 - October 2023

- EXTENSIVE EXPLORATORY DATA ANALYSIS (EDA) TO DETECT THE ANOMALY CAUSED BY THE SENSOR DEGRADATION, WHICH INEVITABLY RESULTS IN THE ERRONEOUS PREDICTION MODEL TRAINING.
- COMBINED WITH THE CONSULTATION WITH ON-SITE WORKERS AND EXPERTS, CONDUCTED THE DATA CALIBRATION AND RE-TRAINED THE PREDICTION MODEL. THE MODEL IS EXPECTED TO BE APPLIED TO THE PROBABILISTIC MANUFACTURING PROCESS CONTROL ALGORITHM.

## Coursework

### Statistics

- (UNDERGRADUATE) REGRESSION ANALYSIS (A+), PROBABILITY THEORY (A+), SAMPLING THEORY (A+), MATHEMATICAL STATISTICS (B), STATISTICAL COMPUTING (A), TIME SERIES ANALYSIS (B+), NONPARAMETRIC STATISTICS (A+), LINEAR METHODOLOGY (A+), EXPERIMENTAL DESIGN (A), MULTIVARIATE ANALYSIS (A+)
- (GRADUATE) THEORETICAL STATISTICS, CATEGORICAL DATA ANALYSIS, BAYESIAN STATISTICS (A+), COMPUTATIONAL STATISTICS, INFERENCE STATISTICS, STATISTICAL METHODS FOR LINEAR MODEL, INTERNATIONAL FINANCE 2

### Mathematics

- (UNDERGRADUATE) ANALYSIS I (A), ANALYSIS II (A+), TOPICS IN ANALYSIS (A+), LINEAR ALGEBRA I (B+), LINEAR ALGEBRA II (A+), DIFFERENTIAL EQUATIONS (A)
- (GRADUATE) REAL ANALYSIS (B+), MATHEMATICS FOR DATA SCIENCE (A+), CONVEX OPTIMIZATION (A)

### Computer Science

- (GRADUATE) PROBABILISTIC GRAPHICAL MODELS (A-), STATISTICAL NATURAL LANGUAGE PROCESSING (A), DEEP LEARNING NATURAL LANGUAGE PROCESSING (B), MACHINE LEARNING (A-), OPTIMIZATION FOR MACHINE LEARNING (A)

## Publications

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† : Authors contributed equally.  
\* : Corresponding author

Selective Generation for Controllable Language Models  
Minjae Lee<sup>†</sup>, **Kyungmin Kim**<sup>†</sup>, Taesoo Kim, Sangdon Park\*  
*Advances in Neural Information Processing Systems (Spotlight)*, 2024, Vancouver, BC, Canada

BIGexplore: Bayesian Information Gain Framework for Information Exploration  
Kihoon Son<sup>†</sup>, **Kyungmin Kim**<sup>†</sup>, Kyunghoon Hyun\*  
*Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, 2022, New Orleans, LA, USA

## Talks and Presentations

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Selective Generation for Controllable Language Models (Oral)  
**Kyungmin Kim**  
*BK21 Best Paper Award (1st Prize)*, January 2025, Pohang, Korea

Selective Generation for Controllable Language Models (Poster)  
Minjae Lee, **Kyungmin Kim**, Taesoo Kim, Sangdon Park  
*The Thirty-eighth Annual Conference on Neural Information Processing Systems*, December 2024, Vancouver, Canada

Selective Generation for Controllable Language Models (Poster)  
Minjae Lee, **Kyungmin Kim**, Taesoo Kim, Sangdon Park  
*Korean Artificial Intelligence Association Summer Conference*, August 2024, Busan, Korea

Markov Chain Monte Carlo-based Manufacturing Process Control Algorithm (Poster)  
**Kyungmin Kim**, Jeyong Lee, Minwoo Chae  
*Korean Statistical Society Winter Conference*, December 2022, Jeju, Korea

BIGexplore: Bayesian Information Gain Framework for Information Exploration (Poster)  
Kihoon Son, **Kyungmin Kim**, Kyunghoon Hyun  
*CHI 2022: ACM CHI Conference on Human Factors in Computing Systems*, May 2022, New Orleans, USA

## Computer Skills

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**Programming**   R (Proficient), Python (Proficient), SAS (Novice)  
**Typesetting**   LaTeX (Proficient)

## Languages

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**Native**   Korean  
**Fluent**   English  
**Beginner**   German