JOONHO BAE

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EDUCATION

Korea Advanced Institute of Science and Technology (KAIST), South Korea 2017-Current

- M.S. in Industrial & Systems Engineering (expected February 2019), GPA 3.89/4.0
  Thesis: "Analysis of Dynamic Systems via Multi-Output Gaussian Process"

Seoul National University (SNU), South Korea 2009-2016

- B.S. in Statistics and Financial Economics, Cumulative GPA 3.50/4.0

RESEARCH INTERESTS

- Development of data-driven, probabilistic models for complex dynamic systems
- Bayesian nonparametric methods (e.g., sparse & multi-output Gaussian Process regression)
- Monitoring and prognostication of dynamic systems based on multi-sensors (e.g., ESS battery system)
- Stochastic optimization and model predictive control
- Operations management and management science
- Sparse & low-rank reconstruction (e.g., recommender systems for mobile applications)
- Learning on graphs and networks (e.g., social networks)

RESEARCH EXPERIENCE

***Research Assistant*, KAIST** (Advisor: Prof. Jinkyoo Park, Sponsor: **LG CNS**) 2018-current

- Prediction of State of Health (SOH) for Energy Storage Systems (ESS)
  - Developed a data-driven, nonparametric approach to estimate SOH
  - Implemented a hierarchical/multi-task strategy exploiting correlations between multi-sensors
- Suggestion of a new criterion of operations management for ESS
  - Suggested a data-driven model to maximize cost-efficiency for ESS operations
  - Optimized the operations of exogenous variables (e.g., C-rate, DoD) to improve the total battery lifecycle
- Real-time system monitoring for ESS
  - Examined data-driven prognosis models for monitoring fault of an ESS battery
  - Constructed a fault detection model based on alarming frequencies

***Research Assistant*, KAIST** (Advisor: Prof. Jeonghye Choi, Sponsor: **Kantar TNS**) 2017-current

- Prediction of future usage for mobile applications from log data
  - Developed a nonparametric time series model to estimate a user-specific usage for mobile applications
  - Recommended personalized lists of mobile applications based on the an estimated future usage
- Development of a targeting strategy
  - Proposed a new segmenting and targeting strategy to maximize the hitting ratio
  - Conducted statistical analysis to estimate the suggested strategy

***Research Assistant*, Seoul National University** (Advisor: Prof. Sinsup Cho, **Time Series Lab.**) 2012-2013

- Revised the Korean Educational Statistics Software (KESS) to enable statistical analysis on Excel
- Predicted Altman Z-score by extracting features based on companies' financial figures

WORK EXPERIENCE

***Marketing Manager*, SK TELECOM** 2015-2017

- Managed more than 40 stores in Seoul
- Developed optimizing tools for distribution of the cell phones to maximize the profits

***Co-Founder & Team Leader*, CHAM SON GIL Cooperative** 2013-2015

- Established a healing center for blind masseurs and developed a unique B2B service and products targeting 20-30s, who were not the main customers of the original market
- Expanded branches to nationwide and opened six stores, ensuring $3,000 monthly income for each masseur on average

***Sergeant*, HHC, 8th U.S. ARMY** 2010-2012

TEACHING EXPERIENCE

***Teaching Assistant*, KAIST** 2018-current

- Data-driven Decision Making and Control (Fall 2018)
- Engineering Statistics I (Spring 2018)

AWARDS & HONORS

- National Science & Technology Scholarship, KOSAF, 2009-2014
- Social Venture Idea ($3,000), Ministry of Employment & Labor, South Korea, 2014
- Enactus National Competition, Enactus, 2014
- Hope Advertisement, Seoul Metropolitan Government, 2013
- SCH Social Venture Idea ($1,000) , Soonchunhyang University, 2013
- SK Social Enterprise ($10,000) , SK Happiness Foundation, 2012
- Army Commendation Medal, 8th U.S. ARMY, 2012

JOURNAL ARTICLES

1. **J. Bae** (with J. Park, and J. Choi). "Recommender Systems via Nonparametric Bayesian Dynamic Tensor Factorization", *Management Science* (to be submitted)
2. **J. Bae** (with J. Park). "Frequency-based Change Detection via Multi-Output Log Gaussian Cox Process", (work in progress)
3. **J. Bae** (with J. Park, S. Soh, and J. Choi). "Modeling Mobile Applications with Stochastic Processes" (work in progress)

CONFERENCE PRESENTATIONS

1. "The Recommender System for Mobile Applications", *2018 Global Marketing Conference*, Tokyo, Japan, July 26-29, 2018
2. "Frequency-based Anomaly Detection via Multi-Output Log Gaussian Cox Process", *2018 Stochastic Processes and their Applications*, Gothenburg, Sweden, June 11-15, 2018.
3. "An Application of Doubly Stochastic Poisson Process for Detecting Abnormalities", *INFORMS Annual Meeting 2018*, Phoenix, AZ, U.S., November 4-7, 2018

SEMINARS (TALKS) INVITED

1. "The Recommender System for Mobile Applications", Department of Business Graduate Seminar, Yonsei University, South Korea, May 29, 2018

TECHNICAL STRENGTHS

- Programming Languages: C, C++, Java, Python, MATLAB
- Statistical Languages: R, SAS, Stata, SPSS, SQL, Excel VBA
- Machine Learning Modules: GPy, GPyOpt, gpflow, tensorflow, keras, PyMC3, GPML, gpstuff

SELECTED COURSEWORK

Operations Research/Management Science

- Stochastic Modeling I — Dr. Kyoung-Kuk Kim
- Stochastic Modeling II — Dr. Kyoung-Kuk Kim
- Convex Optimization — Dr. Woo-Chang Kim
- Game Theory with Engineering Applications — Dr. Jinkyoo Park

Machine Learning/Statistical Learning

- Applications of AI/Data Mining Technology — Dr. Il-Chul Moon
- Statistical Learning Theory — Dr. Changdong Yoo
- Deep Learning for Computer Vision — Dr. Junmo Kim
- Mathematical Foundation of Reinforcement Learning — Dr. Song Chong
- Bayesian Estimation and its Application — Dr. Joohwan Chun

Graduate & Advanced Undergraduate Level from Seoul National University

- Time Series Analysis
- Mathematical Statistics I / II
- Data Mining Methods
- Experimental Design & Survey Practice
- Discrete Data Analysis
- Statistical Computing

REFERENCES

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- **Professor Jeonghye Choi** (Research Co-Advisor)
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- **Professor Seung Bum Soh** (Co-Researcher)
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