Curriculum Vitae

Youngdoo Son

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CURRENT POSITIONS

- **Assistant Professor**, Department of Industrial and Systems Engineering, Dongguk University
- **Current Address:** Wonheung Hall E435, Dongguk University, 30 Pildong-ro 1-gil, Jung-gu, Seoul 04620, Republic of Korea

RESEARCH INTERESTS

- Artificial Intelligence, Statistical Learning, and Data Mining: (2010-present)
  - Kernel methods, Clustering, Active learning, Missing data analysis, Deep learning, Bayesian filtering, Markov chain Monte Carlo, Ensemble method, Support vector machines, Relevance vector machines, Bayesian regression, Chat-bot, Data mining of engineering, business, manufacturing, meteorological, transportation, and medical problems.
- Computational Finance: (2010-present)
  - Financial technologies, Transaction cost estimation, Derivatives pricing and hedging, Model calibration under Levy processes, High-frequency data analysis, Derivative pricing, Data mining of financial time series and market news

EDUCATION

- **Ph.D.** in Industrial Engineering, Seoul National University, 2015.
  - *Dissertation: Sparse Learning Models and Their Applications to Financial Technologies*
- **M.S.** in Industrial and Management Engineering, POSTECH, 2012.
  - *Thesis: Forecasting Up-and-down Signals of Korean Stock Index Using High-frequency Data*
- **B.S.** in Physics, POSTECH, 2010.
  - *Thesis: Strongly Correlated Electronic Materials*

HONORS, AWARDS, AND RECOGNITION

- Best Student Paper Award in Asia Pacific Industrial Engineering & Management Systems Conference: 2014
- The Lee Joong Han Award 2013, Research Part: 2013
- Silver Prize (Second place) in the 7th SAS Mining Championship: 2010

- Teaching and Research Assistant Scholarship: 2012 - 2014
- Tae-Joon Park Graduate Fellowship: 2010 - 2011
- STX Domestic Scholarship: 2009 - 2010
- National Science and Engineering Undergraduate Scholarship: 2006 - 2010
- Samsung SDS Scholarship: 2005 - 2008

PROFESSIONAL EXPERIENCE

- **Assistant Professor**
  - Department of Industrial and Systems Engineering, Dongguk University, 2017-present.
- **Teaching Subjects**
  - Graduate Courses: Data Mining (2017 Fall)
  - Undergraduate Courses: Management Information Systems (2017 Spring), Information Systems Analysis and Design (2017 Spring), Introduction to Financial Engineering (2017 Fall), Introduction to Industrial and Systems Engineering (2017 Fall)
- **Visiting Research Scholar**
  - Department of Industrial and Systems Engineering, Rutgers University, 2015-2017.
- **Postdoctoral Fellow**
  - Institute of Engineering Research Seoul National University, 2015-2017.
- **Research Assistant**
  - Statistical Learning and Computational Finance Lab., Seoul National University, 2012-2015.
  - Informatics Lab., POSTECH, 2010-2012.
- **Teaching Assistant**
  - Graduate Courses: Linear statistical model (2011 Fall), Advanced Topics in Statistical Learning (2013 Spring), Special Topics on Probability Models (2014 Spring)
  - Undergraduate Courses: Introduction to Operations Research (2011 Spring), Freshman Seminar (2011 Fall), Simulation (2012 Fall)

PROFESSIONAL ACTIVITIES

- **Paper Reviewer** for Economic Modelling, Annals of Operations Research, Applied Stochastic Models in Business and Industry, PLOS ONE, Physica A: Statistical Mechanics and its Applications, and Industrial Engineering and Management Systems
- Memberships in the Korean Operations Research and Management Science Society (KORMS), the Korean Institute of Industrial Engineers (KIIE).

PUBLICATIONS

(* corresponding author)

1. **Youngdoo Son**, Sujee Lee, Saerom Park, and Jaewook Lee*, Representative Exemplars Using One-class Gaussian Process Regression, *Pattern Recognition*, Vol. 74, pp. 185-197, February 2018.
2. **Youngdoo Son** and Jaewook Lee*, Active Learning Using Transductive Sparse Bayesian Regression, *Information Sciences*, Vol. 374, pp. 240-254, December 2016.
3. Namhyoung Kim, **Youngdoo Son**, Youngjo Lee, and Jaewook Lee*, Self-correcting ensemble using a latent consensus model, *Applied Soft Computing*, Vol. 47, pp. 262-270, October 2016.

4. **Youngdoo Son**, Hyeongmin Byun, and Jaewook Lee*, Nonparametric Machine Learning Models for Predicting the Credit Default Swaps: An Empirical Study, *Expert Systems with Applications*, Vol. 58, pp. 210-220, October 2016.
5. Saerom Park, Jaewook Lee, and **Youngdoo Son***, Predicting Market Impact Costs Using Nonparametric Machine Learning Models, *PLoS ONE*, Vol. 11, No. 2, e0150243, February 2016.
6. Kyoungok Kim, **Youngdoo Son**, and Jaewook Lee*, Voronoi Cell-based Clustering Using a Kernel Support, *IEEE Transactions on Knowledge and Data Engineering*, Vol. 27, No. 4, pp. 1146-1156, April 2015.
7. **Youngdoo Son**, Dong-jin Noh, and Jaewook Lee*, Forecasting trends of high-frequency KOSPI200 index data using learning classifiers, *Expert Systems with Applications*, Vol. 39, No. 14, pp. 11607-11615, October 2012.

WORKING PAPERS

(* corresponding author)

1. Huisu Jang, Younhee Lee, Hyunwoong Ji, Jaewook Lee, and **Youngdoo Son***, Predicting Arbitrage-free American Option Prices with Pseudo Inputs via Deep Neural Network, *Submitted.*
2. **Youngdoo Son** and Seokho Kang, Regression with re-labeling for noisy data, *Submitted.*
3. **Youngdoo Son**, Jeongsub Choi, Jaewook Lee, and Myong K. Jeong, Restricted Relevance Vector Machine for Missing Data.
4. **Youngdoo Son** and Jaewook Lee, Supervised Deep Autoencoder for Low-dimensional Representation.
5. **Youngdoo Son** and Myong K. Jeong, Active Learning for Count Data Regression.

CONFERENCES

1. Myong Kee Jeong, Jeongsub Choi, **Youngdoo Son**, and Jihoon Kang, Deep Learning based Virtual Metrology and Yield Prediction in Semiconductor Manufacturing Processes, *PHM Asia Pacific 2017*, Jeju, July 2017.
2. Huisu Jang, **Youngdoo Son**, Younhee Lee, and Jaewook Lee, Arbitrage-free Machine Learning Models for Stably Predicting American Index Options, *INFORMS Analytics 2016*, Orlando, April 2016.
3. Gyu-Sik Han, **Youngdoo Son**, Huisu Jang, and Jaewook Lee, Dual-Stage Parameter Estimation for the Stochastic Volatility Model Using Markov Chain Monte Carlo, *Quantitative Methods in Finance*, Sydney, December 2015.
4. Huisu Jang, Jaewook Lee, **Youngdoo Son**, Hyungmin Byun, and Hyunwoong Ji, Arbitrage-Free Deep Learning Models for Stably Predicting American Index Options, *Quantitative Methods in Finance*, Sydney, December 2015.
5. Saerom Park, **Youngdoo Son**, and Jaewook Lee, Analyzing Market Impacts Using Nonparametric Models, *Quantitative Methods in Finance*, Sydney, December 2015.
6. Jaewook Lee and **Youngdoo Son**, Active Learning for Relevance Vector Machine Regression, *INFORMS annual meeting*, Philadelphia, November 2015.
7. Huisu Jang, **Youngdoo Son**, Hyunwoong Ji, and Jaewook Lee, No-arbitrage machine learning models for pricing American options, *27th European Conference on Operational Research*, July 2015.
8. Hyeongmin Byun, **Youngdoo Son**, and Jaewook Lee, Effect of Keyword Search Volume on Credit Default Swap Spread Prediction, *The Joint Conference of KORMS/KIIE/ESK/KSIE/KSS*, Jeju, April 2015.
9. **Youngdoo Son**, Hyeongmin Byun, and Jaewook Lee, Nonparametric models for predicting credit default swap prices: empirical study, *INFORMS annual meeting*, San Francisco, November 2014.

10. **Youngdoo Son**, Saerom Park, Hyeongmin Byun, and Jaewook Lee, Computing default probability using ensemble method, *Asia Pacific Industrial Engineering & Management Systems Conference*, Jeju, October 2014.
11. **Youngdoo Son**, Huisu Jang, Jaewook Lee, and Gyu-Sik Han, Robust parameter estimation for the stochastic volatility model using Markov chain Monte Carlo, *8th World Congress of the Bachelier Finance Society*, Brussels, June 2014.
12. Sujee Lee, Saerom Park, **Youngdoo Son**, and Jaewook Lee, Multi-basin Support Vector Machine for Big Data Analysis Using Hadoop Systems, *2014 Euro-Asia Conference on Computational Intelligence and Communication Networks*, Antalya, April 2014.
13. Namhyoung Kim, **Youngdoo Son**, and Jaewook Lee, New Ensemble Combination Scheme, *The 2013 International Conference on Artificial Intelligence*, Las Vegas, July 2013.
14. **Youngdoo Son**, Hyejin Park, Hyunwoong Ji, Myung Hwan Yun, and Jaewook Lee, Relating News Sentiment and Google Trends, *Asia Pacific Industrial Engineering & Management Systems Conference*, Phuket, December 2012.
15. **Youngdoo Son**, Dong-jin Noh, and Jaewook Lee, Forecasting Korean Stock Index Using Financial Time Series Information, *Asia Pacific Industrial Engineering & Management Systems Conference*, Beijing, December 2011.
16. Hyunwoong Ji, **Youngdoo Son**, Sangwoo Han, Sujee Lee, Saerom Park, Huisu Jang, and Jaewook Lee, Markov chain Monte Carlo algorithm using support partitioning, *The Joint Conference of The Korean Operations Research and Management Science Society and Korean Institute of Industrial Engineers*, May 2013.
17. **Youngdoo Son** and Jaewook Lee, Comparison study of support vector machines, artificial neural networks, and Gaussian processes in forecasting Korean stocks and stock markets, *Conference of Korean Business Intelligence Data mining Society*, Seoul, December 2010.

PATENT

- Device and method for Voronoi cell-based support clustering, registered. (Registration No. 10-1577249)
- Machine learning method using relevance vector machine, computer program implementing the same and information processing device configured to perform the same, applied. (Application No. 10-2016-0116110)