BEOMSEOK SEO

Ph.D., Assistant Professor, Dept. of Statistics, Sookmyung Women's University
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EDUCATION

Ph.D., Statistics, **Penn State University**, University Park, PA   Aug 2016 - Aug 2021

- Thesis: Interpretable Statistical Learning: From Hidden Markov Models to Neural Networks.
- Advisor: Jia Li (Professor of Statistics and Computer Science)

B.A., Economics & Statistics, **Korea University**, Seoul, Korea   Mar 2005 - Feb 2011

RESEARCH INTERESTS

My research interests include a range of related problems in

- Interpretable statistical modeling and machine learning,
- Natural language processing and text mining,
- Development of statistical tools for addressing economic and financial challenges.

PEER-REVIEWED JOURNAL ARTICLES

* Corresponding author

Beomseok Seo*, Younghwan Lee, Hyungbae Cho (2024) "Measuring News Sentiment of Korea Using Transformer." Korean Economic Review(SSCI), 40(1), 149-176.

Beomseok Seo*, Lynn Lin, Jia Li (2022) "Mixture of Linear Models Co-supervised by Deep Neural Networks." Journal of Computational and Graphical Statistics, 31(4), 1303-1317.

Beomseok Seo*, Lynn Lin, Jia Li (2021). "Block-wise Variable Selection for Clustering via Latent States of Mixture Models." Journal of Computational and Graphical Statistics, 31(1), 138-150.

Jia Li, **Beomseok Seo**, Lynn Lin (2019) "Optimal Transport, Mean Partition, and Uncertainty Assessment in Cluster Analysis." Statistical Analysis and Data Mining: The ASA Data Science Journal, 12(5), 359-377.

Seung Jun Shin, **Beomseok Seo***, (2024) "Real-Time Private Consumption Prediction Using Big Data." (in Korean). Korean Journal of Applied Statistics, 37(1), 13-38.

Jae Keun Yoo, Yujin Park, **Beomseok Seo***, (2024) "Using Noise Filtering and Sufficient Dimension Reduction Method on Unstructured Economic Data." (in Korean). Korean Journal of Applied Statistics, 37(2), 119-138.

WORK IN PROGRESS

Beomseok Seo*, (2024+) "Econometric Forecasting Using Ubiquitous News Text: Text-enhanced Factor Model." Bank of Korea Working Paper, 2023(10).   In revision

Beomseok Seo*, Jia Li (2024+) "Explainable machine learning by SEE-Net: closing the gap between interpretable models and DNNs."

In revision

Yuling Chang, **Beomseok Seo** (2024+) "Using Explainable AI to Envision the Future of Work and the Workforce." Submitted

Young Joon Lee, Soohyon Kim, **Beomseok Seo**, Ki Young Park (2024+) "Measuring Monetary Policy Surprises Using Text Mining: The Case of Korea." Will be submitted soon

Beomseok Seo*, Hyungbae Cho, Dongjae Lee (2023) "Point and Risk estImation using an enSemble of Models for Nowcasting: Prism-Now." Bank of Korea Working Paper, 2023(27).

Will be submitted soon

Beomseok Seo* (2023) "Industry Monitoring Using AI Algorithm: Analyst Reports Text Mining", Bank of Korea Issue Note, 2023(5). Will be submitted soon

WORKING PAPERS

Beomseok Seo*, Younghwan Lee, Hyungbae Cho (2022) "Machine-Learning-Based News Sentiment Index (NSI) of Korea", Bank of Korea Working Paper, 2022(15).

Beomseok Seo* (2021) "Interpretable Statistical Learning: From Hidden Markov Models to Neural Networks", Penn State University Ph.D Dissertation, State College, PA.

SELECTED CONFERENCE & SEMINAR TALKS

Korea Development Institute (*KDI*), Sejong	*Jul 2024*
International Symposium on Forecasting (*ISF*) *2024*, Dijon	*Jul 2024*
Chung-nam institute (*CNI*), Gongju	*Jun 2024*
Bank of Korea, BOK Friday Lecture, Seoul	*Feb 2024*
Czech National Bank (*CNB*), *Macroeconomic Forecasting Division Seminar*, Prague	*Oct 2023*
European Central Bank (*ECB*), *DG-E Wide Seminar*, Frankfrut	*Oct 2023*
Bank for International Settlements (*BIS*), *Meeting with IDE and Machine Learning Community*, Basel	
	Oct 2023
The Korean Statistical Society & Bank of Korea Joint Forum 2022, Seoul	*Sep 2022*
Central Bank Research Association (*CEBRA*) *Conference 2022*, Barcelona	*Aug 2022*
Korea Information Society Development Institute (*KISDI*), Seoul	*Jun 2022*
The Korean Statistical Society Conference (*TKSS*) *2022*, Seoul	*Jun 2022*
Korea University Dept. of Statistics, Seoul	*May 2022*
Workshop on Data-Driven Future Prediction Policy Support Model Research by the Society for Economic, Humanities, and Social Studies, Seoul	*May 2022*
Bank of Korea Statistics Forum 2021, Seoul	*Nov 2021*
The Korean Statistical Society Conference (*TKSS*) *2021*, Seoul	*Nov 2021*
Ewha Womans University Dept. of Statistics 2021, Seoul	*Oct 2021*
Computational and Financial Econometrics (*CFE*) *2019*, London	*Dec 2019*
Joint Statistical Meetings(*JSM*) *2019*, Denver	*Jul 2019*
Joint Statistical Meetings(*JSM*) *2018*, Vancouver	*Jul 2018*
50th Anniversary Conference of the Statistics Dept., State College	*May 2018*

EMPLOYMENT

Assistant Professor, *Sookmyung Women's University*, Seoul, Korea

- **Dept. of Statistics**, *Sep 2024 - Present*

Senior Economist, *The Bank of Korea*, Seoul, Korea

- **Research Dept., Office of Economic Modeling and Policy Analysis**, *Feb 2023 - Aug 2024*
- **Statistics Research Unit**, *Jun 2021 - Jan 2023*
- **Economic Statistics Dept., National Expenditure Statistics Team**, *Feb 2013 - Jun 2016*
- **Financial Markets Dept.** *Jan 2011 - Feb 2013*

Adjunct Professor,

- **Dept. of Quantitative Applied Economics**, *Sungkyunkwan Univ.*, Seoul *Sep 2023 - Present*
- **Dept. of Statistics**, *Korea Univ.*, Seoul *Sep 2023 - Sep 2024*

Researcher, *Pennsylvania State University*, State College, PA

- **Dept. of Statistics**, *Summer 2018, Summer 2020, & Summer 2021*
- **Smeal College of Business**, *Summer 2020*
- **Dept. of Political Science**, *Summer 2017*

Korea Army, Paju, Korea *Aug 2006 - Jul 2008*

ADDITIONAL POSITIONS

Committee Member of the Recruitment Exam for the Bank of Korea. *2021*

Committee Member of Real-Time Economic Diagnosis for the Korea Development Institute. *2024*

TEACHING EXPERIENCE

Statistics & Engineering

- *Sookmyung Women's University*, Seoul
  - Statistical Methods I (MA in Statistics), *Fall 2024*
  - Practicum in Statistical Analysis (Undergrad in Statistics), *Fall 2024*

- *Korea University*, Seoul
  - STA830, Machine Learning for Finance and Economics (MA in Statistics), *Fall 2023*

- *Penn State University*, State College, PA
  - STAT200, Elementary Statistics (Undergrad in Statistics), *Summer 2019, Summer 2021*
  - STAT418, Introduction to Probability and Stochastic Processes (Undergrad in Engineering), *Spring 2020*

Economics

- *Korea University*, Seoul
  - PSF632, Topics in Data Information (MA in Policy Studies), *Spring 2024*

- *Sungkyunkwan University*, Seoul
  - QAE5009, Big Data Analytics in Macroeconomics (MA in Economics), *Fall 2023*

FELLOWSHIPS, HONORS, AND AWARDS

Excellent Employee Award for Research from The Bank of Korea.   *Jun 2023*

Teaching Fellowship offered by Penn State Univ.   *Spring 2017 - Spring 2021*

Best Poster Award of The Statistics Dept. at Penn State Univ.   *May 2018*

Graduate Study Fellowships awarded by The Bank of Korea.   *Fall 2016 - Spring 2018*

Best Honors Scholarship in Korea University Dept. of Economics.   *Fall 2010*

Academic Excellence Scholarship in Korea University Dept. of Economics.

Spring 2006, Fall 2009, Spring 2010

ADDITIONAL TRAINING EXPERIENCE

Barcelona Graduate School of Economics, Summer School, Barcelona
- Time Series Vector Auto Regressive Models   *Jul 2014*

IMF, Singapore Regional Training Institute, Singapore
- Financial Markets and Instruments   *Dec 2012*

Advanced Mathematics Program of The Bank of Korea Academy, Seoul
- Stochastic Process, Real Analysis, Differential Equations   *Mar 2012 - Dec 2015*

LANGUAGES

English, Korean (fluent)

PROGRAMMING LANGUAGES

Python/Tensorflow, R, SQL (advanced), MATLAB, C/C++, CSS (intermediate)

PROGRAMS

Text Indices Hub, *Interactive website*. (Launching initially takes several minutes.)
- Providing Theme Frequency in News Indices (TFNI), Text-based Business Confidence Indicators (TBCI).

Tspoon, *Python modules on PyPI*,
- Time-series pre-processing, period conversion, normalization, visualization, and more

MLM, *Python modules on GitHub*,
- Interpretable non-linear regression or classification based on "Mixture of Linear Models Co-supervised by Deep Neural Networks"

HDclustVS, *R package on GitHub*,
- A Block-wise Variable Selection Method for High-dimensional Clustering via Latent States of Mixture Models

OTclust, *R package on CRAN*,
- Mean Partition, Uncertainty Assessment, Cluster Validation and Visualization Selection for Cluster