

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

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

EMPLOYMENT

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

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

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

<i>Excellent Employee Award for Research</i> from The Bank of Korea.	<i>Jun 2023</i>
<i>Teaching Fellowship</i> offered by Penn State Univ.	<i>Spring 2017 - Spring 2021</i>
<i>Best Poster Award</i> of The Statistics Dept. at Penn State Univ.	<i>May 2018</i>
<i>Graduate Study Fellowships</i> awarded by The Bank of Korea.	<i>Fall 2016 - Spring 2018</i>
<i>Best Honors Scholarship</i> in Korea University Dept. of Economics.	<i>Fall 2010</i>
<i>Academic Excellence Scholarship</i> in Korea University Dept. of Economics.	<i>Spring 2006, Fall 2009, Spring 2010</i>

ADDITIONAL TRAINING EXPERIENCE

Barcelona Graduate School of Economics, Summer School, Barcelona - Time Series Vector Auto Regressive Models	<i>Jul 2014</i>
IMF, Singapore Regional Training Institute, Singapore - Financial Markets and Instruments	<i>Dec 2012</i>
Advanced Mathematics Program of The Bank of Korea Academy, Seoul - Stochastic Process, Real Analysis, Differential Equations	<i>Mar 2012 - Dec 2015</i>

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