

BEOMSEOK SEO

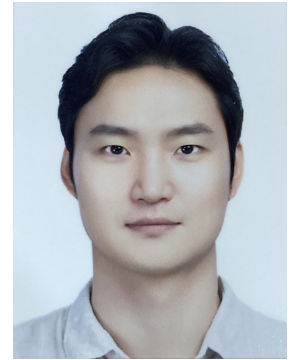
Ph.D., Economist

Office of Economic Modeling and Policy Analysis, Bank of Korea

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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](#)

B.A., Economics & Statistics, **Korea University**, Seoul, Korea

Mar 2005 - Feb 2011

EMPLOYMENT

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

- **Office of Economic Modeling and Policy Analysis**, *Feb 2023 - Present*
 - Researching short-term forecasting, policy analysis, and macroeconomic models
 - Writing short-term economic forecasting for Korean economic outlook (KEO)
- **Statistics Research Unit**, *Jun 2021 - Jan 2023*
 - Natural language processing, big data modeling for financial markets and real economy
 - Compiling news sentiment index, economic policy uncertainty index
- **Economic Statistics Department**, *Feb 2013 - Jun 2016*
 - Time series modeling and compiling GDP and expenditures
- **Financial Markets Department**, *Jan 2011 - Feb 2013*
 - Time series modeling, volatility analysis for short-term financial markets
 - Writing weekly issue notes for monetary policy committee meeting

Adjunct Professor,

- **Dept. of Quantitative Applied Economics**, *Sungkyunkwan Univ.*, Seoul *Sep 2023 - Present*
 - Teaching MA students big data analytics in macroeconomics
- **Dept. of Statistics**, *Korea Univ.*, Seoul *Sep 2023 - Present*
 - Teaching MA students machine learning for finance and economics

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

- **Dept. of Statistics**, *Summer 2018, Summer 2020, & Summer 2021*
 - Researching high-dimensional unsupervised learning problems, working under Jia Li
 - Researching interpretable neural network models, working under Lynn Lin
- **Smeal College of Business**, *Summer 2020*

- Researching neural networks for longitudinal data, working under Lei Wang

• **Dept. of Political Science,**

Summer 2017

- Researching misclassified event-failure models, working under Bumba Mukherjee

Korea Army, Paju, Korea

Aug 2006 - Jul 2008

RESEARCH INTERESTS

My research interests include a range of related problems in

- Interpretable statistical modeling and machine learning,
- Developing tools to better understand macroeconomics, finance, and monetary policy,
- Dealing with various text-related economic and financial problems.

PEER-REVIEWED JOURNAL ARTICLES

* Corresponding author

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

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. Published

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. Published

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. Published

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

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. Accepted

WORK IN PROGRESS

Beomseok Seo*, (2024+) "Econometric Forecasting Using Ubiquitous News Text: Text-enhanced Factor Model." In revision

Beomseok Seo*, Jia Li (2024+) "SEE-Net: Synced and Explanation-Enhanced Neural Network." Will be submitted soon

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 (2024+) "Point and Risk estimation using an ensemble of Models for Nowcasting: Prism-Now." Will be submitted soon

WORKING PAPERS

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

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

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

Seung Jun Shin, Beomseok Seo* (2022) "Real Time Private Consumption Prediction Using Big Data. (in Korean) [빅데이터를 이용한 실시간 민간소비 예측]", Bank of Korea Working Paper, 2022(16).

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*, (2022) "Economic Forecasting Using News Texts: Construction and Utilization of Economic Sector Text Indices. (in Korean) [뉴스텍스트를 이용한 경기예측: 경제 부문별 텍스트 지표의 작성과 활용]", Bank of Korea Issue Note, 2022(18).

Beomseok Seo*, Younghwan Lee, Hyungbae Cho (2022) "Construction and Utilization of News Sentiment Index (NSI) Using Machine Learning. (in Korean) [기계학습을 이용한 뉴스심리지수(NSI)의 작성과 활용]", Bank of Korea National Account Review, 2022(1), 68-90.

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

Czech National Bank (CNB), Macroeconomic Forecasting Division Seminar, Prague	Oct 2023
European Central Bank (ECB), DG-E Wide Seminar, Frankfurt	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

TEACHING EXPERIENCE

Adjunct Professor, Korea University, Seoul

- *Department of Statistics*

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

Adjunct Professor, Sungkyunkwan University, Seoul

- *Department of Quantitative Applied Economics*

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

Instructor, Penn State University, State College, PA

- *Department of Statistics*

- STAT200, Elementary Statistics (Undergraduate in Statistics), *Summer 2019, Summer 2021*

- STAT418, Introduction to Probability and Stochastic Processes (Undergraduate in Engineering), *Spring 2020*

FELLOWSHIPS, HONORS, AND AWARDS

Best Research Excellent Employee Award of 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).

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