Seunghan Lee

- Date of Birth: July 29, 1996 (28 years old)
- Country: Republic of Korea
- Military Service: Completed
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  - Website: GitHub Blog

Education

Undergraduate

Yonsei University, Seoul (March 2015 – August 2020)

- Majors: Business Administration / Applied Statistics
- GPA (4.5 scale): Overall 4.19 (Business 4.31, Applied Statistics 4.35)
- Additional Information:
  - Early graduation (7 semesters)
  - Summa Cum Laude (Top 1% of the cohort)

Integrated Master's & PhD Program

Yonsei University, Seoul (September 2020 – (Expected) August 2025)

- Major: Statistics and Data Science
- GPA (4.5 scale): 4.29
- Co-advisors:
  - Prof. Taeyoung Park (DSLab)
  - Prof. Kibok Lee (ML Lab)

Research Interests

- Deep Learning with Time Series (TS) Data
- Representation Learning, Foundation Models, Diffusion Models
- Also interested in ...
  - Multimodal Learning, Vision-Language Model, Audio Deep Learning

Publications (* Equally Contributed, † Co-corresponding Authors)

10. Channel Normalization for Time Series Channel Identification (2025)

- Seunghan Lee, Taeyoung Park†, Kibok Lee†
- Under review

9. Soft Contrastive Learning for Irregular Time Series (2025)

- Junghoon Lim, Seunghan Lee, Taeyoung Park
- Under review

8. Sequential Order-Robust Mamba for Time Series Forecasting (2024)

- Seunghan Lee*, Juri Hong*, Kibok Lee†, Taeyoung Park†
- In *NeurIPSW (Time Series in the Age of Large Models)* , 2024. [arxiv:2410.23356]

7. Partial Channel Dependence with Channel Masks for Time Series Foundation Models (2024)

- Seunghan Lee, Taeyoung Park†, Kibok Lee†
- In *NeurIPSW (Time Series in the Age of Large Models)*, 2024. Oral Presentation (Top 5) [arxiv:2410.23222]

6. Adaptive Noise Schedule for Time Series Diffusion Models (2024)

- Seunghan Lee, Kibok Lee†, Taeyoung Park†
- In *NeurIPS*, 2024. [arXiv:2410.14488]
- Outstanding Paper Award from the Journal of Korean Artificial Intelligence Association (JKAIA).

5. Learning to Embed Time Series Patches Independently (2024)

- Seunghan Lee, Taeyoung Park, Kibok Lee
- In *ICLR*, 2024. [arXiv:2312.16427]
- Preliminary version: *NeurIPSW (Self-Supervised Learning: Theory and Practice)*, 2023. Oral Presentation (Top 4)

4. Soft Contrastive Learning for Time Series (2024)

- Seunghan Lee, Taeyoung Park, Kibok Lee
- In *ICLR*, 2024. Spotlight (366/7262=5%) [arXiv:2312.16424]
- Preliminary version: *NeurIPSW (Self-Supervised Learning: Theory and Practice)*, 2023.

3. Hierarchical Multi-Task Learning with Self-Supervised Auxiliary Task (2024)

- Seunghan Lee, Taeyoung Park
- In *The Korean Journal of Applied Statistics 37(5): 631-641*, 2024.

2. MAD-GL2: Multimodal Adaptive Dynamic Graph Learning with Global and Local Features for Multivariate Time Series Forecasting (2024)

- Seunghan Lee*, Kibok Lee*, Taeyoung Park
- In Progress

1. Improving Gibbs Sampler (2022)

- Taeyoung Park, Seunghan Lee
- In *Wiley Interdisciplinary Reviews: Computational Statistics 14(2): e1546*, 2022.

Intellectual Property

- 2023.10: Review evaluation method using review quality metrics
- 2024.12: Universal time series analysis method and system for irregular multivariate time series

Invited Talks

- 2024.08. Korean Artificial Intelligence Association

Languages & Certifications & Awards

Programming Languages (Proficiency Level)

- Proficient: Python (Pandas, NumPy, Sklearn, PyTorch, TensorFlow)
- Intermediate: SQL, R
- Basic: Docker, Kubernetes

Certifications

Field	Certifications	Score	Date
CS/Data	ADSP (Associate Data Science Professional)	-	2018.09
	Computer Proficiency Level 1		2019.03
	SQLD (SQL Developer)		2020.06
	Big Data Analyst		2021.07
	AWS Cloud Practitioner		2021.08
Linguistics	TOEIC	965/990	2020.08
Etc.	Korean History Proficiency Test Level 1	Level 1	2012.08
	TESAT (Korean Economic Newspaper)	S-Level	2013.05

Awards

Field	Awards	Rank	Date
Academic	Academic Excellence Awards		2018.12 / 2019.06
	Summa Cum Laude Graduation		2020.08
CS	Yonsei Data Science Competition	2nd	2019.11
	Sony Pictures Audience Prediction	4th	2020.01
	Yonsei Data Science Competition	2nd	2021.12
	BK Winter Academic Conference	4th	2022.12
	Yonsei Data Science Competition	1st	2023.02
Economy	TESAT Team Excellence Award	2nd	2013.05

Internship / Project

1. [Internship] SK Telecom

- **Period**: July 2019 – August 2019
- **Division**: ICT Infra Center > **Major Role**: Data Science > **Sub Role**: Data Analytics (Department: AI Home)
- **Responsibilities**: Conducted data analysis and service planning for *EveryAir*, SKT's air quality information service.
    - **Analysis 1**: Analyzed air quality data from air sensors and public air monitoring stations, addressing measurement errors.
    - **Analysis 2**: Designed service strategies based on data analysis of parents in their early to mid-30s.
    - **Analysis 3**: Planned air quality reports, including content structuring and visualization.

2. [Internship] Yonsei University, Graduate School of Computational Science & Engineering

- **Period**: December 2019 – February 2020
- **Research Area**: Data Science & Deep Learning > Network Embedding
- **Responsibilities**: Implemented research papers on network embedding and conducted related seminars.
- **Programming Language**: Python

3. [Industry-Academia Collaboration] Amore Pacific Collaborative Project

- **Period**: February 2020 – December 2022 (3 years)
- **Analysis Topic**: User and purchase behavior analysis for Amore Pacific
- **Programming Language**: Python, R

[2020 Project]

1. Analyzed purchasing behavior of offline, online, and omni-channel customers and segmented omni-channel users.
2. Predicted sales of hair and body products through direct selling.
3. Analyzed web log data to understand online user behavior patterns.

- Key Algorithms: Random Forest, Logistic Regression, Hierarchical Clustering

[2021-2022 Project]

- Project: Development of Context Brand Score (CBS)
- Developed a brand index that considers consumer sentiment on cosmetic product attributes using text data (social buzz, reviews).
- Key Algorithms: Hierarchical BERT, Aspect-Based Sentiment Analysis, KoBERT

4. [Project] Hyundai Mobis - Service Parts Demand Forecasting

- Period: June 2022 - December 2022
- Description: Short- and long-term demand forecasting for low-circulation and eco-friendly parts.
- Key Algorithms: GNN, GAN, Domain Adaptation, SSL with Tabular Data
- Programming Language: Python

5. [Instructor] Yonsei University Atmospheric Science Department - Data Analysis

- Period: November 2020 - February 2021
- Responsibilities: Provided statistical and clustering analysis training for graduate students and assisted with data analysis.
- Tasks: Preprocessed meteorological data and performed dimensionality reduction and clustering.
- Key Algorithms: Self-Organizing Map (SOM), K-Means
- Programming Language: Python

6. [Teaching Assistant] SK Hynix – Bayesian Statistics & ML Course

- **Period**: April 2021 – June 2021
- **Responsibilities**: Conducted coding exercises for Bayesian Statistics and Machine Learning courses.
- **Programming Language**: R

7. [Instructor] KB Bank – Computer Vision / GAN

- **Period**: July 2021
- **Content**:
  - **Computer Vision**: CNN basics, LeNet, AlexNet, ZFNet, VGG16, Inception, ResNet, DenseNet
  - **GAN**: GAN basics, DCGAN, CGAN, LSGAN
- **Programming Language**: Python (TensorFlow 2, PyTorch)

8. [Teaching Assistant] Python Programming & Web Crawling

- **Period**: March, September 2021,2022,2023,2024
- **Content**: Basic Python syntax and web data collection.
- **Programming Language**: Python

9. [Instructor] Hanwha Ocean – Data Analysis & Statistics

- **Period**: July 2023
- **Content**: Fundamental statistical analysis, including correlation analysis, regression analysis, and time series analysis.

Academic Society/Club

Name	Details	Period	Etc
ISSU	Yonsei Univ. IT Management Strategy Society	2018.03 ~2018.12	Industry-academia collaboration projects. Python mentor.
Bitamin	Big Data Analytics Club	2018.07 ~2019.06	
Data Science Lab	Yonsei Univ. Data Science Society	2019.01 ~2020.06	1st President

[Academic Society] ISSU (Yonsei University IT Management Strategy Society)

- **Period**: March 2018 – December 2018
- **Regular Sessions**: Conducted industry-academia collaboration projects with IT companies, including Naver Papago, Naver VIBE, Send Anywhere, and Amanda.
- **Study Sessions**:
  - **1st Semester**: Contributed an article on *AI in the Arts* to *IT Chosun* (Link).
  - **2nd Semester**: Served as a Python mentor, teaching fundamental Python concepts to society members.

[Club] BITAMIN (Big Data Analytics Club)

- **Period**: August 2018 – March 2019
- **Activities**: Focused on machine learning and text mining using R and Python.
- Conducted three machine learning projects.

[Academic Society] Data Science Lab (Yonsei University Data Science Society)

- **Period**: February 2019 – June 2020
- **Founding President**: June 2019 – December 2019
- Studied the entire data science workflow, from data collection and preprocessing to modeling.

- Organized regular sessions and study groups on ML and DL.
- Led group projects and participated in competitions on related topics.
- Conducted training sessions for society members on
    - Data Preprocessing, Association Analysis, SVM, Boosting, CNN

[Study Group] OWOP (One Week One Paper)

- Period: January 2021 – June 2021
- Conducted a research paper study group with five graduate students from the Department of Statistics and Data Science at Yonsei University.
- Topics: AI and statistics-related subjects, including CV, NLP, BNN, and Recommender Systems.
- Format: Weekly presentations on selected papers or topics.
- Key Presentation Topics: Variational Inference, Deep Generative Models (VAE, Normalizing Flow).

[Study Group] Deep Learning Paper Reading Study

- Period: May 2021 – September 2021
- Conducted a research paper study group with five graduate students from the Department of Statistics and Data Science at Yonsei University.
- Format: Reviewed and presented four research papers weekly, each covering a different topic.
- Topics:
    1. Meta Learning
    2. Continual Learning
    3. Interpretable Learning
    4. Reliable Learning

Competitions and Projects

1. [Dacon] 2019 KBO Baseball Player Performance Prediction

- **Period**: January 2019 – February 2019
- **Task**: Predicting KBO baseball player performance for the first half of 2019
- **Algorithms**: MA, ARIMA, Random Forest

2. [Yonsei Data Science Competition] Embrain

- **Period**: March 2019 – May 2019
- **Result**: 4th
- **Task**: Developing a marketing strategy for highly meticulous consumers

3. [Yonsei Data Science Competition] PACKUS

- **Period**: September 2019 – November 2019
- **Result**: 2nd
- **Tasks**:
    1. Customer segmentation and personalized strategy development
    2. Future sales prediction for key products
- **Algorithms**: RNN, XGBoost, LightGBM, SOM, Association Analysis

4. [Sony Pictures] Movie Audience Prediction

- **Period**: November 2019 – January 2020
- **Result**: 4th
- **Task**: Predicting cumulative audience numbers for the first 14 days after a movie's release
- **Algorithms**: Random Forest, XGBoost, Stacking, NN

5. [Kakao] Melon Playlist Continuation

- **Period**: May 2019 – July 2019
- **Task**: Predicting missing songs and tags in a given playlist

6. [IGA Works] CTR Prediction

- **Period**: December 2019 – February 2020
- **Task**: Predicting click-through probability when a user is exposed to an ad.
- **Algorithm**: Deep CTR

7. [Dacon] AI Competition for Psychological Tendency Prediction

- **Period**: September 2020 – November 2020
- **Task**: Developing an algorithm for psychological test analysis and voter prediction
- **Algorithms**: AutoML, Deep CTR

8. [BigCon Test] NS Home Shopping Schedule Optimization

- **Period**: July 2020 – October 2020
- **Task**: Optimizing home shopping schedules to maximize sales
- **Algorithms**: CatBoost, LightGBM, Bayesian Optimization

9. [Hyundai Industries] Big Data/AI Competition

- **Period**: January 2021 – February 2021
- **Result**: Finalist (18th place out of 284 teams)
- **Task**: Predicting manufacturing process task durations and optimizing task allocation
- **Algorithms**: Bayesian Neural Network, LightGBM

10. [Yonsei Data Science Competition] Hyodol

- **Period**: September 2021 – December 2021
- **Result**: 2nd
- **Task**: Customer clustering and predicting optimal engagement times for personalized care
- **Algorithms**: Multi-task Learning, Self-Organizing Map

11. [Conference] 2022 Winter BK Academic Conference

- **Period**: December 2022
- **Result**: 4th
- **Task**: Multivariate time series forecasting using Spatio-Temporal GNN

12. [Yonsei Data Science Competition] KCB

- **Period**: December 2022 - February 2023
- **Result**: 1st
- **Task**: Multi-task learning for individuals and businesses using self-supervised learning
    - **Regression**: Credit score prediction
    - **Classification**: Credit rating prediction
    - **Time Series Forecasting**: Future revenue prediction
    - **Clustering**: Customer segmentation
- **Algorithms**: SSL with Tabular Data