KYUNGWOO SONG (송경우)

Assistant Professor @ University of Seoul

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EDUCATION

KAIST, Daejeon, Korea   *Mar. 2017 - Feb. 2021*
Ph.D. in Industrial & Systems Engineering
Advisor: Il-Chul Moon
Thesis: Context-Aware Model with Generalized Structured Gate and Attention

KAIST, Daejeon, Korea   *Mar. 2015 – Feb. 2017*
M.S. in Industrial & Systems Engineering
Advisor: Il-Chul Moon
Thesis: Deep Ideal Point Estimation With Network

KAIST, Daejeon, Korea   *Feb. 2010 – Feb. 2015*
B.S. in Mathematical Sciences
B.S. in Industrial & Systems Engineering

EMPLOYMENT

University of Seoul, Seoul, Korea   *Mar. 2021 - present*
Assistant Professor, Department of AI

PUBLICATIONS

Peer-Reviewed Papers

[1] **Kyungwoo Song**, Yohan Jung, Dongjun Kim, and Il-Chul Moon, "Implicit Kernel Attention", AAAI Conference on Artificial Intelligence (AAAI) 2021.

[2] Hyemi Kim, Seungjae Shin, JoonHo Jang, **Kyungwoo Song**, Weonyoung Joo, Wanmo Kang, and Il-Chul Moon, "Counterfactual Fairness with Disentangled Causal Effect Variational Autoencoder", AAAI Conference on Artificial Intelligence (AAAI) 2021.

[3] Seungjae Shin, **Kyungwoo Song**, Joonho Jang, Hyemi Kim, Weonyoung Joo, and Il-Chul Moon, "Neutralizing Gender Bias in Word Embedding with Latent Disentanglement and Counterfactual Generation", Findings of Empirical Methods in Natural Language Processing (Findings of EMNLP) 2020.

[4] ByeongHu Na, Hyemi Kim, **Kyungwoo Song**, Weonyoung Joo, Yoonyeong Kim, and Il-Chul Moon, "Deep Generative Positive-Unlabeled Learning under Selection Bias", Conference on Information and Knowledge Management (CIKM) 2020.

[5] **Kyungwoo Song**, "Context Aware Sequence Modeling", International Joint Conference on Artificial Intelligence (IJCAI) 2020, Doctoral Consortium.

[6] **Kyungwoo Song**, JoonHo Jang, Seung jae Shin, and Il-Chul Moon, "Bivariate Beta-LSTM", AAAI Conference on Artificial Intelligence (AAAI) 2020.

[7] Su-Jin Shin, **Kyungwoo Song**, and Il-Chul Moon, "Hierarchically Clustered Representation Learning", AAAI Conference on Artificial Intelligence (AAAI) 2020.

[8] Mingi Ji, Weonyoung Joo, **Kyungwoo Song**, Yoonyeong Kim, and Il-Chul Moon, "Sequential Recommendation with Relation-Aware Kernelized Self-Attention", AAAI Conference on Artificial Intelligence (AAAI) 2020.

[9] **Kyungwoo Song***, Mingi Ji*, Sungrae Park, and Il-Chul Moon, "Hierarchical Context enabled Recurrent Neural Network for Recommendation", AAAI Conference on Artificial Intelligence (AAAI) 2019.

[10] Sungrae Park, **Kyungwoo Song**, Mingi Ji, Wonsung Lee, and Il-Chul Moon, "Adversarial Dropout for Recurrent Neural Networks", AAAI Conference on Artificial Intelligence (AAAI) 2019.

[11] Il-Chul Moon, Jinhyung Tak, Sang-Hyeon Kim, and **Kyungwoo Song**, "Ballistic Coefficient Estimation with Gaussian Process Particle Filter" International Conference on Control, Automation and Systems (ICCAS) 2018.

[12] **Kyungwoo Song**, Wonsung Lee, and Il-Chul Moon, "Neural Ideal Point Estimation Network", AAAI Conference on Artificial Intelligence (AAAI) 2018.

[13] Il-Chul Moon, **Kyungwoo Song**, Sang-Hyeon Kim, and Han-Lim Choi, "State Prediction of High-speed Ballistic Vehicles with Gaussian Process", International Journal of Control, Automation and Systems (IJCAS), 2018.

[14] Wonsung Lee, **Kyungwoo Song**, and Il-Chul Moon, "Augmented Variational Autoencoders for Collaborative Filtering with Auxiliary Information", Conference on Information and Knowledge Management (CIKM) 2017.

[15] **Kyungwoo Song**, Sang-Hyeon Kim, Jinhyung Tak, Han-Lim Choi, and Il-Chul Moon, "Data-driven ballistic coefficient learning for future state prediction of high-speed vehicles", International Conference on Information Fusion (FUSION) 2016.

[16] **Kyungwoo Song**, Do-Hyeong Kim, Su-Jin Shin, and Il-Chul Moon, "Identifying the evolution of disasters and responses with network-text analysis", IEEE International Conference on Systems, Man, and Cybernetics (SMC) 2014.

Under Review

[1] Dongjun Kim, **Kyungwoo Song**, Seungjae Shin, Wanmo Kang, Il-Chul Moon, "Posterior-Aided Regularization for Likelihood-Free Inference".

[2] Dongjun Kim, **Kyungwoo Song**, Yoonyeong Kim, Yongjin Shin, and Il-Chul Moon, "Sequential Likelihood-Free Inference with Implicit Surrogate Proposal".

[3] Yohan Jung, **Kyungwoo Song**, and Jinkyoo Park, "Approximate Inference for Spectral Mixture Kernel".

[4] Dongjun Kim, Weonyoung Joo, Seungjae Shin, **Kyungwoo Song**, and Il-Chul Moon, "Adversarial Likelihood-Free Inference on Black-Box Generator".

[5] Yooon-Yeong Kim, **Kyungwoo Song**, JoonHo Jang, and Il-chul Moon, "Look-Ahead Acquisition with Informative Mixup for Active Learning".

(* Equal Contribution)

TEACHING

University of Seoul, Korea

- Lecturer, Introduction to Statistical Methodology (spring 2021)

- Lecturer, Foundations of Programming (spring 2021)

KAIST, Korea

- Teaching Assistant, Introduction to Data Structure and Algorithm I, KOOC (Apr. 2019 - Jul. 2019)

- Teaching Assistant, Introduction to Data Structure and Algorithm II, KOOC (Apr. 2019 - Jul. 2019)

- Teaching Assistant, Advanced Artificial Intelligence and Machine Learning, KOOC (Aug. 2018)

- Teaching Assistant, Introduction to Artificial Intelligence and Machine Learning II, KOOC (Mar. 2018 - Jul. 2018)

- Teaching Assistant, Introduction to Data Structure and Algorithm II, KOOC (Nov. 2017 - Dec. 2017)

- Teaching Assistant, Applied Data Structures, and Algorithms, ISysE (Sep. 2017 - Dec. 2017)

- Research Mentor, Undergraduate Research Program (URP), Movie Recommendation with Matrix Factorization based on Trust and Auxiliary information (Jun. 2016 - Dec. 2016)

- Teaching Assistant, Introduction to Artificial Intelligence and Machine Learning I, KOOC (Apr. 2016 - Jun. 2016)

- Teaching Assistant, Applications of AI/DM Technology, ISysE (Mar. 2016 - Jun. 2016)

- Teaching Assistant, Applied Data Structures, and Algorithms, ISysE (Sep. 2015 - Dec. 2015)

Hanbat National University, Korea

- Part-Time Lecturer, Operations Management, Business Administration (Mar. 2017 - Aug. 2017)

Daejeon Youth Edu-Culture Center, Korea

- Volunteer Lecturer for Mathematics (Feb. 2013 - Dec. 2014)

AWARDS & SCHOLARSHIPS

Best Thesis Award, KAIST, 2021
Volunteers and Grants Program, IJCAI-PRICAI, 2020
Research Supporting Program, KAKAO, 2018
Student Scholar, AAAI, 2018
Student Travel Grant, SMC, 2014
2nd prize, The competition of Ministry of Knowledge Economy (Korea), 2010
Excellence Prize, The competition of Ministry of Environment (Korea), 2010

INVITED TALKS

University of Seoul, Korea (May. 2021)
Institute for Basic Science, Korea (Dec. 2020)
POSTECH, Korea (Oct. 2020)
Australian National University, Australia (Aug. 2020)
KAKAO, Korea (May 2018)
NAVER, Korea (Apr. 2018)

SERVICES

Senior Program Committee Member: IJCAI 2021
Program Committee Member: IJCAI 2020, ACL 2020, CMOT 2020, EMNLP 2020, NeurIPS 2020, AAAI 2021, ICLR 2021, AISTATS 2021, ICML 2021

PROJECT

Removing Spurious Bias for Large-Scale Fair AI *July. 2021 - Present*
funded by University of Seoul

Development of Fair AI Algorithm by Removing Spurious Bias *May. 2021 - Present*
funded by University of Seoul

Deep Learning Based Material Design *May. 2021 - Present*
funded by University of Seoul

Virtual Metrology for Plasma Enhanced Chemical Vapor Deposition *Oct. 2020 - Present*
funded by semiconductor company in Korea

Vision-based semiconductor quality inspection *Apr. 2020 - Sep. 2020*
funded by semiconductor company in Korea

Classification for customer's financial transaction history *Nov. 2019 - Mar. 2020*
funded by commercial bank in Korea

Vision-based tire quality inspection *Mar. 2019 - Oct. 2019*
funded by tire company in Korea

Natural Language Processing *Oct. 2018 - Dec. 2018*
funded by NAVER Clova

Multi-language, multi-source, polymorphic data analysis *Jul. 2016 - Dec. 2017*
funded by National Research Foundation (NRF)

Estimation and prediction of high-speed vehicle trajectory *Mar. 2015 - Jun. 2016*
funded by Government Agency

**Development of temporal and spatial text mining technique and application to crime
pattern analysis and prediction** *Jun. 2014 - Dec. 2014*
funded by KAIST Undergraduate Research Program (URP)

Identifying "strategic research areas" for basic research *Jan. 2013 - Aug. 2013*
funded by National Research Foundation (NRF)

Measuring the social impacts of publicly funded R&D *Feb. 2013 - Jun. 2013*
funded by Korea Institute of Science & Technology Evaluation and Planning

Strategy for maximizing online customer's satisfaction *Jan. 2012 - Feb. 2012*
funded by KT

Strategy for enlarging the number of 30~40's women customer *Nov. 2010 - Dec. 2010*
funded by Ticket Monster